ATTACHMENT 5

Siting Report - Alternative Segment Re-route Feasibility Study (July 2015)

Siting Report

Riverside Transmission Reliability Project
Alternative Segment
Re-route Feasibility Study

Prepared: July 2015

Prepared by

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EXECUTIVE SUMMARY

HISTORY & BACKGROUND

Riverside Public Utilities (RPU) imports electricity to serve City of Riverside (City or Riverside) residents through a single power connection from Southern California Edison's (SCE) Vista Substation located in the city of Grand Terrace. Through that connection, only a certain amount of energy, 557 megawatts (MW), can reach the City.

The Riverside Transmission Reliability Project (RTRP) is designed to enhance reliability, providing Riverside a secondary connection to SCE's grid. The project will also provide greater flexibility to expand the City's energy delivery system to meet Riverside's growing energy needs well into the future.

Riverside certified an Environmental Impact Report (EIR) for the RTRP on February 5, 2013. The EIR process initiated with a Notice of Preparation (NOP) filed with the California Office of Planning and Research in 2007, included a second NOP filed in 2009, and the publication of a Draft EIR in July 2011. Riverside addressed numerous comments throughout the roughly six-year long scoping and EIR process, including issues raised by the County of Riverside, City of Jurupa Valley (Jurupa Valley) (officially incorporated in March 2011), the California Public Utilities Commission (CPUC), and various local land-owners and developers.

RTRP, as certified in the EIR, includes the construction of approximately 10 miles of new double-circuit 230 kV transmission line, a new 230/69 kV electrical substation, and new 69 kV subtransmission lines. The new 230 kV transmission line would connect the proposed substation, located on RPU-owned land near the northeast corner of Wilderness Avenue and Ed Perkic Street, to SCE's existing Mira Loma-Vista No. 1 220 kV transmission lines. Six new 69 kV subtransmission lines would also connect the proposed substation to RPU's electrical system.

In November 2013, Jurupa Valley adopted a Mitigated Negative Declaration (MND) authorizing a 466-single family residential development, known as Riverbend, proposed by CV Communities, LLC. Riverbend is currently owned by Lennar Homes of California, Inc. (Lennar) and is generally bounded by the Goose Creek Golf Club on the east, the I-15 on the west, the Santa Ana River on the south, and 68th Street on the north.

In March 2015, Jurupa Valley authorized a separate multi-family residential development known as the Vernola Marketplace Apartment Community project (Vernola Apartments). This development of 25 apartment buildings includes 397 residential units on a 17.4-acre property at the northwest corner of 68th Street and Pats Ranch Road.

Approximately 1.5 miles of RTRP's 230 kV transmission route would occupy portions of the same properties proposed for the Riverbend and Vernola Apartment developments.

Despite formal comment letters submitted by SCE during the public review period of the MNDs for both projects, Jurupa Valley did not identify RTRP in its environmental assessment for Riverbend, and the MNDs were approved without the consideration of the RTRP transmission segment in this area. The MNDs prepared for both the Riverbend and Vernola Apartment Projects engaged in no analysis of alternatives and provided no analysis of how a those project could be designed in ways that would also accommodate the development of RTRP's 230 kV transmission line.

In April 2015, SCE submitted (and subsequently amended) its application for a Certificate of Public Convenience and Necessity (CPCN) to the CPUC in support of RTRP's construction. Various protests to SCE's CPCN application were received.[1] These protests include arguments that intervening land use entitlements granted by Jurupa Valley require the reconsideration of RTRP per the California Environmental Quality Act ("CEQA") and generally allege RTRP's proposed 230 kV transmission line route impacts various development projects and the financial expectations of their investment-backed developers.

In light of these arguments and in support of SCE's response to question 3 of the CPUC's May 22, 2015 *Deficiency Report for the Riverside Transmission Reliability Project Application (A.15-04-013)* (Deficiency Report), SCE's RTRP project team revisited the RTRP siting analysis with respect to the areas potentially impacted by SCE's proposed 230 kV transmission line to consider if compatibility could be improved between RTRP and the approved developments in area.

SITING OBJECTIVES

The objectives for this siting analysis included:

- Exploring segment re-routes in the vicinity of the Riverbend, Vernola Marketplace, and other developments (*see* Figure 4 – *Riverbend Area Segments for Alternative Segment Re-Route Study*).

[1] Protestors include: 12071 Bellegrave Avenue, LLC ("Bellegrave"); APV Investments PA 13, LLC, Bellaterra Investments PA 13, LLC, Boomer Investments PA 13, LLC, and Shellina Investments PA 13, LLC (collectively, "APV" herein); Center for Community Action and Environmental Justice ("CCAEJ"); Jurupa Valley; Lennar; The Office Of Ratepayer Advocates ("ORA"); Sky Country Investment Co./East, LLC ("Sky Country"); Stratham Company ("Stratham"); Vernola Apartments; and Anthony P. Vernola, Successor Trustee of the Pat & Mary Ann Vernola Trust-Marital Trust, and Anthony P. Vernola, Trustee of the Anthony P. Vernola Trust U/D/T Dated October 18, 2000, as amended (collectively, "Vernola Trust").

- Identify and evaluate potential environmental, economic, legal, social, technological, or other issues affecting the potential above-ground RTRP routing options.

TECHNICAL ASSUMPTIONS

Technical assumptions made for this siting analysis included:

- The general study area for the alternative segment re-route (Riverbend Area herein) was defined as: Bain Street and Santa Ana River on the east; the Santa Ana River on the south; I-15 on the west; and the Mira Loma-Vista No. 1 220 kV line on the north. (*See* Figure 4).

- The right-of-way (ROW) width needed for the above-ground segment is approximately 100 feet.

- The height of the new poles would not exceed approximately 180 feet above ground surface.

SUMMARY OF ALTERNATIVES

To develop the individual segments for consideration, the existing RTRP and proposed pole locations near the Riverbend Area were reviewed to determine a proposed pole location(s) that could serve as the eastern/southernmost point from which to base a meaningful pool of segments and/or segment group combinations to meet the siting objectives. The northern/western terminus for the segment pool was the Mira Loma-Vista No. 1 220 kV line, which begins at the Mira Loma Substation, located north and west of the Riverbend development, and traverses northeast to the Vista substation located near the City of San Bernardino.

After engineering review, the eastern/southernmost locations from which to base segment alternatives were identified as near Pedley Substation east of the Santa Ana River, and the Goose Creek Golf Club immediately west of the Santa Ana River (*see* Figure 2 – Location Map). These locations were chosen for their proximity to the Riverbend Area and their ease in developing multiple segments and multiple segment group combinations.

From those pole locations, options for re-routing a segment of RTRP to increase the compatibility between RTRP and the Riverbend Area developments[2] included two main directional choices:

[2] *See* SCE Response to CPUC Deficiency Report, Attachment Q1 (List and Map of Approved Projects), July 21, 2015.

- North through the Santa Ana River and the Jurupa Valley community to Mira Loma-Vista 1 220 kV; and

- West then North: West through the Jurupa Valley community, then north at I-15 to the Mira Loma-Vista 1 220 kV; or west through the Jurupa Valley community then north through the Jurupa Valley community to the Mira Loma-Vista 1 220 kV.

Key North Segments and Results Summary:

Key north segments (*see* Figure 4) were defined as those that provided the north-south foundation for multiple segment groupings to connect the RTRP's transmission line located south and east of Riverbend Area, to the Mira Loma-Vista No. 1 200 kV line north of the Riverbend Area. For this study, key north segments included:

- **Interstate 15 (RTRP Preferred Project):** Interstate 15 is a north-south freeway with land historically used for agriculture adjacent to I-15, stretching from the Riverbend area to the Mira Loma-Vista No. 1 220 kV line. The EIR identified the I-15 corridor as the preferred project segment in the study area.

- **Bain Street (Segment M):** Bain Street, a two-lane road approximately 35 feet wide, was identified because of the availability of approximately 56 feet of road shoulder on the east side. However, Bain Street dismissed as a viable segment alternative for several reasons. One important reason cited was conflicts with the Jurupa Area Plan, which is part of the Riverside County General Plan. The Jurupa Area Plan identifies Bain Street as a "Major," road with an ultimate width of approximately 118 feet. The City of Jurupa Valley has not completed their General Plan and unless changed by Ordinance by the City Council of Jurupa Valley, all Riverside County plans are adopted by the City. The current roadway and dirt shoulder on the east side is only approximately 90 feet wide, Bain Street's planned ultimate width (as described in the Jurupa Area Plan) would conflict with the ROW needs for the RTRP 230 kV transmission line. Further, additional design and engineering considerations would be required to safely cross over an existing subtransmission line, and two natural gas transmission pipelines, as well as avoid a water pumping station at the corner of Limonite Avenue and Bain Street. The project team also reviewed the original RTRP Siting Study (*see* Appendix 1 - *Riverside Transmission Reliability Project Siting Study*), which also dismissed the Bain Street route option. The past study also considered Bain Street's designation as a "Major" road and planned ultimate width between Limonite and Bellegrave Avenue as a negative factor. Additionally, newspaper articles from 2009 also identified that the Bain Street residents opposed a Bain Street route due to its proximity to the Mira Loma Middle School, located approximately 150 feet east of Bain, just north of the intersection of Jurupa Avenue and Bain Street. In light of these considerations, this report eliminated this segment from further consideration.[3]

The SCE RTRP technical team also considered two other possible segments to carry the line north from near the Riverbend area to the Mira Loma-Vista No. 1 220 kV line. These two potential segments were:

1) the County flood control channel, from the Goose Creek Golf Course to Cantu-Galleano Ranch Road; and

2) Etiwanda Avenue, from Limonite to the Mira Loma-Vista No. 1 220 kV line.

However, these potential segments were primarily dismissed in light of their need to acquire a significant amount of ROW currently occupied by commercial and/or residential uses.

Key West Segments and Results Study:

Key west segments were defined as those that provided the east-west foundation for multiple segment groupings to connect the RTRP's transmission line located south and east of Riverbend area, to a key north segment in order to connect to the Mira Loma-Vista No. 1 200 kV line north of the Riverbend area. For this study, key west segments included:

- **Limonite Avenue (Segments A, B, C, D, E):** Limonite Avenue is a major thoroughfare located approximately 0.8-mile north and east of Riverbend, and traverses from Bain Street on the east end of the study area to the I-15 on the west end of the study area. It generally offers large sections of undeveloped land on the south side of the street. However the team noted three major constraints: 1) engineering would be difficult at the intersection of Etiwanda Avenue and Limonite Avenue because it contains commercial development, and the road narrows from four lanes to two lanes; 2) several homes and small businesses would be impacted on the south side of Limonite between Etiwanda Avenue and Troth Street; and 3) the vacant area on the north side of Limonite Avenue between Wineville Avenue and the I-15 appears to have been constructed for a residential development by APV Investments. APV Investments has two sites under residential development at this location. Because existing residences occupy the south side of Limonite Avenue west of Wineville Avenue, the new segment would need to be located within the vacant land on the north side of Limonite Avenue, west of Wineville Avenue. The new transmission line would require approximately 100 feet of the property on the north side of Limonite Avenue, resulting in the need to acquire portions of the same property currently under

[3] For the past siting study, the Bain Street route included a segment south of Bain Street, within a sensitive species area. For this current siting study, the sensitive species area was not needed as a segment alternative and therefore was not included.

construction for the Lennar residential development. The project team considered and eventually eliminated utilizing Limonite Avenue due to the above-mentioned concerns.

- **Adjustment of Existing Proposed Segment through Riverbend (Segment J):** The project team also explored several options to adjust the proposed segment through the northern section of Riverbend, immediately adjacent to 68th Street, in an effort to potentially improve the compatibility between Riverbend and RTRP. The project team reviewed, but eliminated, this segment for reasons including issues with the placement of the lines (such as the overhang of insulators and conductors onto 68th Street), the relocation of an existing subtransmission line, and the need to acquire property planned for residential use by Riverbend.

- **Within the Southern Portion of the Goose Creek Golf Club Property and Riverbend Development (Segment K)**: This segment would cross the Santa Ana River at the Goose Creek Golf Club, at the location described in the RTRP EIR. Once across the Goose Creek Golf Course at Riverbend's eastern edge, the 230 kV line would proceed west, southwest, and then west again along the southern edge of Riverbend's proposed tract homes, but north of an undeveloped green space between Riverbend and the Santa Ana River channel. The 230 kV line then would continue until just east of I-15, where it would turn north to 68th Street, where it would continue as the RTRP transmission line as described in the EIR. It is unknown whether this segment would result in new significant environmental impacts and/or a substantial increase in the severity of a documented significant impact under CEQA. Regardless, subject to final engineering and route alignment, Segment K has the potential to result in greater environmental impacts than the proposed segment selected by the RTRP EIR due to the proximity of the Santa Ana River to the southern edge of the golf course where the new poles would likely be constructed. The Santa Ana River is an area of high environmental, hydrological, and geological sensitivities that must be studied to determine potential impacts and viability of this route.

RESULTS

As documented herein, despite Jurupa Valley's approvals of certain developments in the Riverbend Area, the RTRP EIR's conclusions remain valid with respect to the Riverbend Area. Specifically, this study finds that the approximately 1.5 miles of RTRP's 230 kV transmission route that occupies portions of the heretofore unoccupied Riverbend and Vernola Apartment projects remains the environmentally superior alternative under CEQA. None of the alternative segments, or segment groupings, considered in this analysis would have less environmental impacts than RTRP's currently proposed transmission segment in this area.

Chapter 1: INTRODUCTION

1.1 Background

RPU imports energy for City residents through a single power connection from SCE's Vista Substation, located in the city of Grand Terrace. Through that connection, only a certain amount of energy, 557 megawatts (MW), can reach the City.

Currently, as there are no other transmission connections, if the electrical needs of RPU customers exceed 557 MW, SCE would be unable to provide additional capacity. While over the past ten years RPU has built a number of power generation plants within the City that can help supply extra energy in time of peak demands and emergencies, these plants do not provide a reliable, long-term solution to the City's capacity shortage, nor can they be counted on to meet current and projected energy load growth.

RTRP is designed to enhance reliability, providing Riverside a secondary connection to SCE's grid. The project will also increase the amount of energy RPU can import and provide greater flexibility to expand the City's energy delivery system to meet Riverside's growing energy needs well into the future.

Riverside certified an EIR for RTRP on February 5, 2013.[4] The EIR process initiated with a Notice of Preparation (NOP) filed with the California Office of Planning and Research in 2007, included a second NOP filed in 2009, and the publication of a Draft EIR in July 2011. Riverside addressed numerous comments throughout the roughly six-year long scoping and EIR process, including comments from the County of Riverside, Jurupa Valley (officially incorporated in March 2011), and a law firm representing a developer of a potential project in Jurupa Valley that would be situated within the same location as a portion of the 230 kV RTRP line route (*see* Figure 1 - *RTRP Route as certified by City of Riverside EIR*).

RTRP, as certified in the EIR, includes the construction of approximately 10 miles of new double-circuit 230 kV transmission line, a new 230/69 kV electrical substation, and new 69 kV subtransmission lines. The new 230 kV transmission line would connect the proposed substation, located on RPU-owned land near the northeast corner of Wilderness Avenue and Ed Perkic Street, to SCE's existing Mira Loma-Vista No. 1 220 kV transmission lines. Six new 69 kV subtransmission lines would also connect the proposed substation to RPU's electrical system.

In November 2013, Jurupa Valley adopted a Mitigated Negative Declaration (MND) authorizing a 466-single family residential development, known as Riverbend, proposed

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4 *See* Resolution of the City of Riverside Certifying the RTRP EIR, *available at* http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/408ED33B0022983588257E280080F26B/$FILE/A.15-04-XXX%20RTRP%20-%20SCE%20EIR-Administrative%20Record_Volume%203%20-%20100-199%20Part%201%20of%202.pdf (Document #105).

by CV Communities, LLC.[5] Riverbend is currently owned by Lennar Homes of California, Inc. (Lennar) and is generally bounded by the Goose Creek Golf Club on the east, the I-15 on the west, the Santa Ana River on the south, and 68th Street on the north.

In March 2015, Jurupa Valley authorized a separate multi-family residential development known as the Vernola Marketplace Apartment Community project (Vernola Apartments). This development of 25 apartment buildings includes 397 residential units on a 17.4-acre property at the northwest corner of 68th Street and Pats Ranch Road.

Approximately 1.5 miles of RTRP's 230 kV transmission route would occupy portions of the same properties proposed for the Riverbend and Vernola Apartment developments. Despite formal comment letters submitted by SCE during the public review period of the MNDs for both projects, Jurupa Valley did not identify RTRP in its environmental assessment for Riverbend, and the MNDs were approved without the consideration of the RTRP transmission segment in this area. The MNDs prepared for both the Riverbend and Vernola Apartment Projects engaged in no analysis of alternatives and provided no analysis of how a those project could be designed in ways that would also accommodate the development of RTRP's 230 kV transmission line.

In April 2015, SCE submitted (and subsequently amended) its application for a Certificate of Public Convenience and Necessity (CPCN) to the CPUC in support of RTRP's construction. Various protests to SCE's CPCN application were received.[6] These protests include arguments that intervening land use entitlements granted by Jurupa Valley require the reconsideration of RTRP per the California Environmental Quality Act ("CEQA") and generally allege RTRP's proposed 230 kV transmission line route impacts various development projects and the financial expectations of their investment-backed developers.

In light of these arguments and in support of SCE's response to question 3 of the CPUC's May 22, 2015 *Deficiency Report for the Riverside Transmission Reliability Project Application (A.15-04-013)* (Deficiency Report), SCE's RTRP project team revisited the RTRP siting analysis with respect to the areas potentially impacted by SCE's proposed 230 kV transmission line to consider if compatibility could be improved between RTRP and the approved developments in area.

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[5] *See* Final Initial Study/Mitigated Negative Declaration, Riverbend, City of Jurupa Valley, *available at* http://jurupavalley.org/Portals/21/Documents/Public%20Information%20and%20Notices/Public%20Notices/Vernola%20Marketplace%20Apartments/Final%20DraftIS-MND.forpublication.1-27-2015%20-%20Collated.pdf

[6] Protestors include: 12071 Bellegrave Avenue, LLC ("Bellegrave"); APV Investments PA 13, LLC, Bellaterra Investments PA 13, LLC, Boomer Investments PA 13, LLC, and Shellina Investments PA 13, LLC (collectively, "APV" herein); Center for Community Action and Environmental Justice ("CCAEJ"); Jurupa Valley; Lennar; The Office Of Ratepayer Advocates ("ORA"); Sky Country Investment Co./East, LLC ("Sky Country"); Stratham Company ("Stratham"); Vernola Apartments; and Anthony P. Vernola, Successor Trustee of the Pat & Mary Ann Vernola Trust-Marital Trust, and Anthony P. Vernola, Trustee of the Anthony P. Vernola Trust U/D/T Dated October 18, 2000, as amended (collectively, "Vernola Trust").

1.2 Historical Siting Studies

In 2006, RPU studied possible corridors for the transmission and subtransmission lines, and identified constraints in those corridors (*see Riverside Transmission Reliability Project Siting Study*, attached here as Appendix). Between 2006 and 2008, additional information was reviewed. As described in Figure 3 - *RTRP Route Corridors Previously Studied*, the primary corridors reviewed during past siting efforts included:

> **Van Buren Offset –** primarily utilizing Van Buren Street, adjacent to the railroad. This was analyzed in the EIR but not selected due to environmental impacts of greater magnitude as compared to the RTRP Proposed Project alternative, including but not limited to construction within 100-year floodplains, more potential high-value Land and Water Conservation Funds (LCWF) lands and wildlife habitat impacts, displacement of two single-family residences and removal of several other "out buildings," and the potential of traffic related impacts during construction. Therefore, this was eliminated.
>
> **Bain Street –** uses a westerly alignment along the north bank urban/natural interface of the Santa Ana River, to south of Bain Street, then north onto Bain Street. This route was eliminated in the EIR due to environmental impacts to the north bank of the Santa Ana River and a conflict with the Jurupa Area Plan that calls for the ROW of Bain Street to increase from approximately 80 feet wide (including the existing trail and road shoulders), to 118 feet wide.
>
> **I-15 Route –** this was ultimately identified in the EIR as the proposed project alignment. However, in the vicinity of the Riverbend development, the segment was originally designed to skirt the southern boundary of the golf course and utilize the southern portion of the Riverbend development (akin to Segment K discussed herein). The line was subsequently adjusted to traverse the golf course property to avoid impacts to sensitive habitat. This route was analyzed in the EIR, and selected to be the environmentally superior alternative.
>
> **East Route –** this route, proposed by the County of Riverside and the residents of the Jurupa Valley, would hug the north and/or south banks of the Santa Ana River, forcing the placement of approximately 40 structures within a flood hazard zone, and another 55 structures in areas with high exposure to liquefaction, erosion and slope instability. This route was eliminated in the EIR.

SCE prepared a *Constructability Report*, dated April 28, 2008 (attached here as Appendix) that addressed the construction feasibility of the various alternatives. In June 2010, SCE prepared a preliminary geology and geotechnical evaluation of the routes (*see SCE Preliminary Geology and Geotechnical Evaluation* attached here as Appendix). A summary of the SCE previous determinations are provided in Appendix .

1.3 Key Siting Activities for Alternative Segment Re-route

The following represents a summary of the siting activities for the current effort to re-route a segment around the Riverbend development:

- Staff from SCE's Corporate Environmental Health and Safety (CEHS) division and Transmission Engineering reviewed the previous siting studies and environmental information, and developed alternative segments that could be more compatible with the developments in the Riverbend Area. Information collection for project team review included previous siting studies, environmental constraints, (*e.g.* biological, cultural, sensitive receptors, *etc*.), and mapping of existing SCE facilities, *etc.*

- Staff from SCE's technical groups, including Transmission Engineering, Corporate Environmental Health and Safety, Transmission Project Delivery, and Subtransmission, field-verified the feasibility of the proposed segments developed by Transmission Engineering and CEHS.

- SCE's Subject Matter Experts (SMEs) evaluated the various segments against SCE's standard criteria for siting 220 kV facilities and provided a numeric score, consistent with SCE's internal siting procedures.

- The SCE's RTRP Project Team reviewed segments and SCE SME scores; team discussions were held to identify potentially viable segments that may be more compatible with developments in the Riverbend Area.

Figure 1 – RTRP Route as Certified by City of Riverside EIR

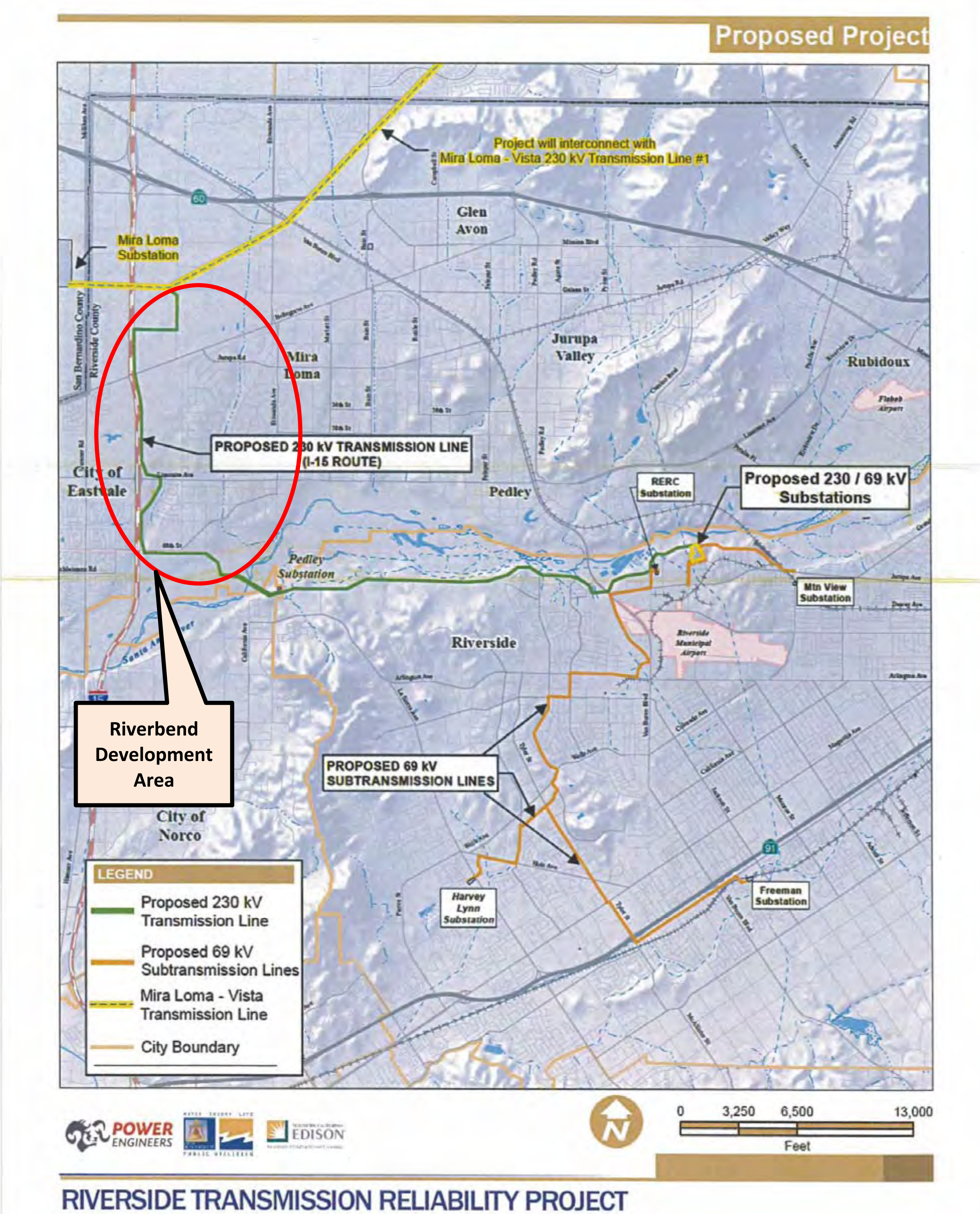


Figure 2 – Riverbend Development Location Map

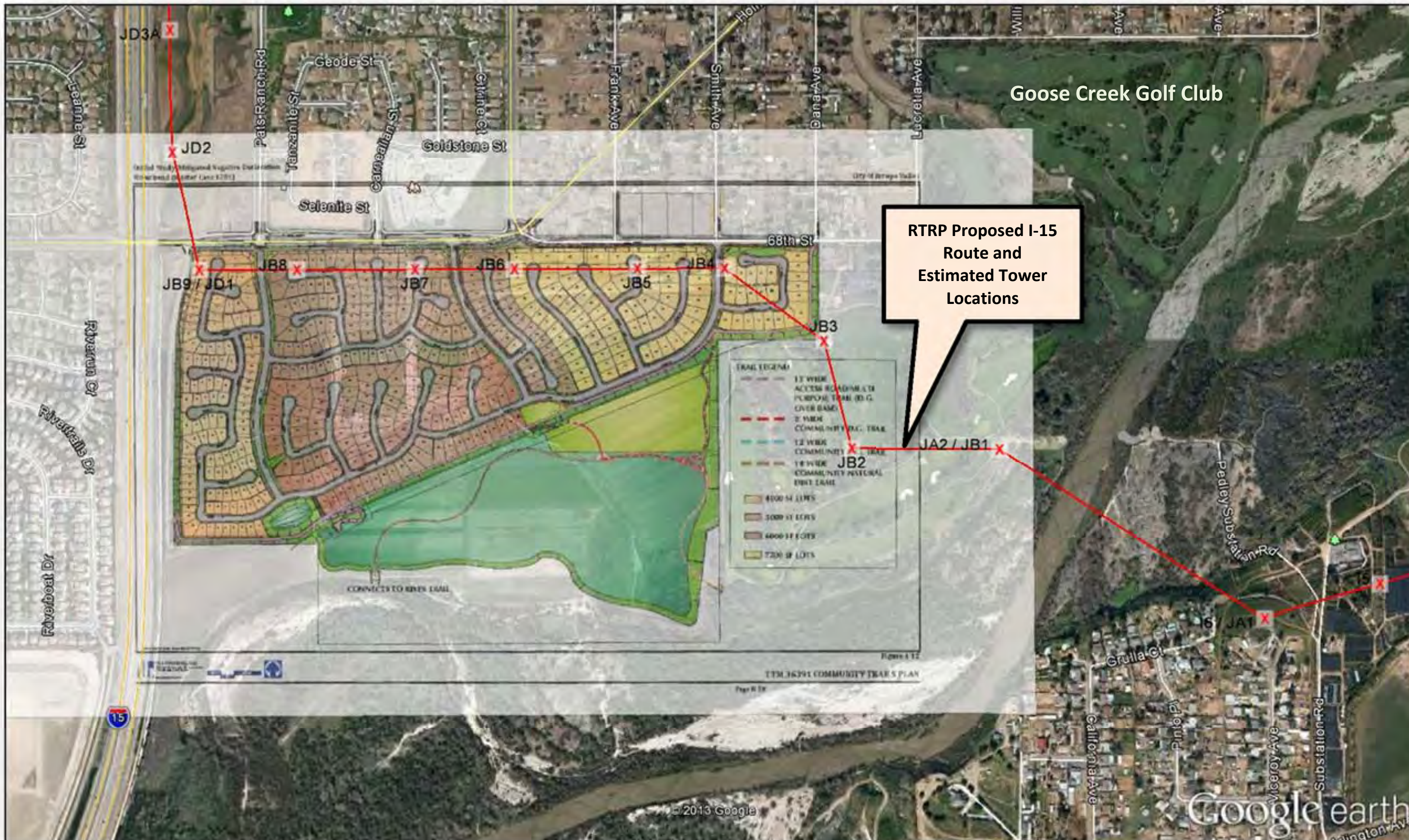
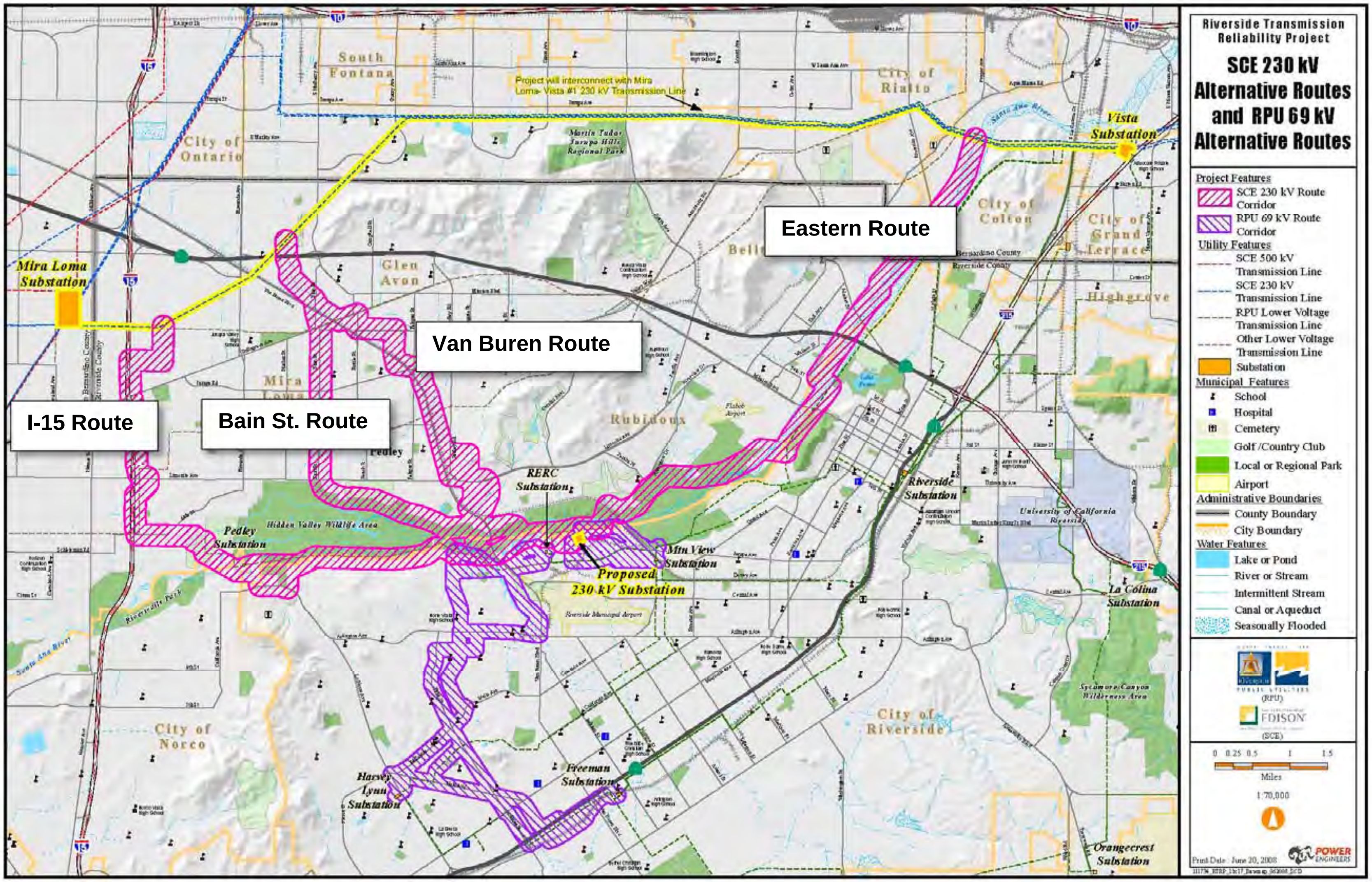


Figure 3 – RTRP Route Corridors Previously Studied



Chapter 2: ALTERNATIVE SEGMENT RE-ROUTE SITING PROCESS

The siting process for this report included various meetings and field evaluations.

2.1 Siting Objectives

The objectives for this siting analysis included:

- Exploring segment re-routes in the vicinity of the Riverbend Area (*see* Figure 4).

- Identify and evaluate potential environmental, economic, legal, social, technological, or other issues affecting the potential above-ground RTRP routing options.

2.2 Technical Assumptions

Certain technical assumptions made for this siting analysis included:

- The general study area for the Riverbend Area was defined as: Bain Street and Santa Ana River on the east; the Santa Ana River on the south; I-15 on the west; and the Mira Loma-Vista No. 1 220 kV line on the north.

- The right-of-way (ROW) width needed for the segment is approximately 100 feet.

- The height of the new poles would not exceed approximately 180 feet above ground surface.

For this report, SCE utilized its standard siting procedures as outlined in SCE's "*Siting and Licensing Guidelines*," by Transmission Project Licensing (March 2008). The goal of the siting process is to enable a defensible decision, minimize unexpected costs, incorporate multi-disciplinary objectives and criteria, allow for flexibility to respond to changing requirements, and allow for meaningful involvement by the affected public.[7] CEH&S facilitated this siting process for the project.

The siting process for this project included the following steps:

Step 1 **–** Identify the Project Study Area (the Riverbend Area);
Step 2 **–** Identify Opportunities, Concerns, and Constraints in the Riverbend Area;
Step 3 **–** Identify routing alternatives; and
Step 4 **–** Review/selection of the alternative segments and segment groupings.

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[7] Adapted from the *Integrated Facility Siting Process*, 1994.

The methodology used in the screening and evaluation process by the SMEs and Project Team includes ranking the segments and segment groupings, as well as gathering additional data from the local stakeholders and government sources.

The team did not study or evaluate the other routes proposed in the EIR, as the scope of this re-route was limited to the areas within and around the developments in the Riverbend Area.

Chapter 3: SEGMENT DESCRIPTIONS

For this study, 17 segments were identified to be independently scored and calculated to develop the segment group to utilize in the Riverbend Area (*see* Figure 4). The segments are described as follows. Those in **bold** type were also studied during the 2006/2007 RTRP siting/constructability studies. Therefore, the previous studies and information regarding these segments were also reviewed and considered.

- Segment A - Limonite 1 (I-15 to Flood Control Channel)
- Segment B - Limonite 2 (Between Flood Control Channel and Etiwanda Avenue)
- Segment C - Limonite 3 (Between Etiwanda and Ridgeview)
- Segment D - Limonite 4 (Ridgeview to Troth Street)
- Segment E - Limonite 5 (Troth Street to Bain Street
- Segment F - Flood Control Channel (Between Limonite and Golf Course)
- Segment G - Lucretia Ave (Golf Course to FC Channel)
- Segment H - Existing 66 kV ROW in Golf Course
- **Segment I - "Golf Course North" (Lucretia Avenue at Flood Control Channel, north on Golf Course property to 66th Street, east on golf course along 66th Street, north behind homes on Etiwanda, Ridgeview, to Limonite Avenue). Previous constructability studies included portion of this segment.**
- Segment J - "Riverbend East and North Fringe" (modification of existing proposed segment through Riverbend)
- **Segment K – "Riverbend South." Previous constructability studies included this segment.**
- Segment L - Mira Loma-Bain-Pedley 66 kV ROW (in Santa Ana River)
- **Segment M - Bain Street (Limonite to Mira Loma-Bain-Pedley ROW above Bellegrave Ave). Previous constructability studies included this segment.**
- Segment N – Bellegrave Ave (between Bain Street and proposed structure JD21 near I-15).
- Segment O - Union Pacific Rear Lot to Mira Loma-Vista No. 1 220 kV
- Segment P – Cantu-Galleano Ranch Road + Existing 66 kV ROW
- Segment Q - Etiwanda (Union Pacific Front Lot between Cantu-Galleano Ranch Road and the Mira Loma-Vista 220 kV ROW).

SCE's RTRP team also considered two other possible segments to carry the line north from near the Riverbend area to the Mira Loma-Vista No. 1 220 kV line. These two potential segments were:

- The County flood control channel, from the Goose Creek Golf Course to Cantu-Galleano Ranch Road; and

- Etiwanda Avenue, from Limonite to the Mira Loma-Vista No. 1 220 kV line.

However, these potential segments were primarily dismissed in light of their need to acquire a significant amount of ROW currently occupied by commercial and/or residential uses.

3.1 Key Directional Segments

Several segments were determined to be key directional segments, which provide the foundation upon which to group the re-route options. These included the following:

Key East-West Segments:

Key east-west segments were defined as those that provided the east-west foundation for multiple segment groupings to connect the RTRP's transmission line located south and east of Riverbend area, to a key north segment, to connect to the Mira Loma-Vista No. 1 200 kV line north of the Riverbend area. For this study, key west segments included:

- Segments A, B, C, D, E – Limonite Avenue

- Segment J – "Riverbend East and North Fringe" (modification of existing proposed segment through Riverbend)

- Segment K – "Riverbend South"

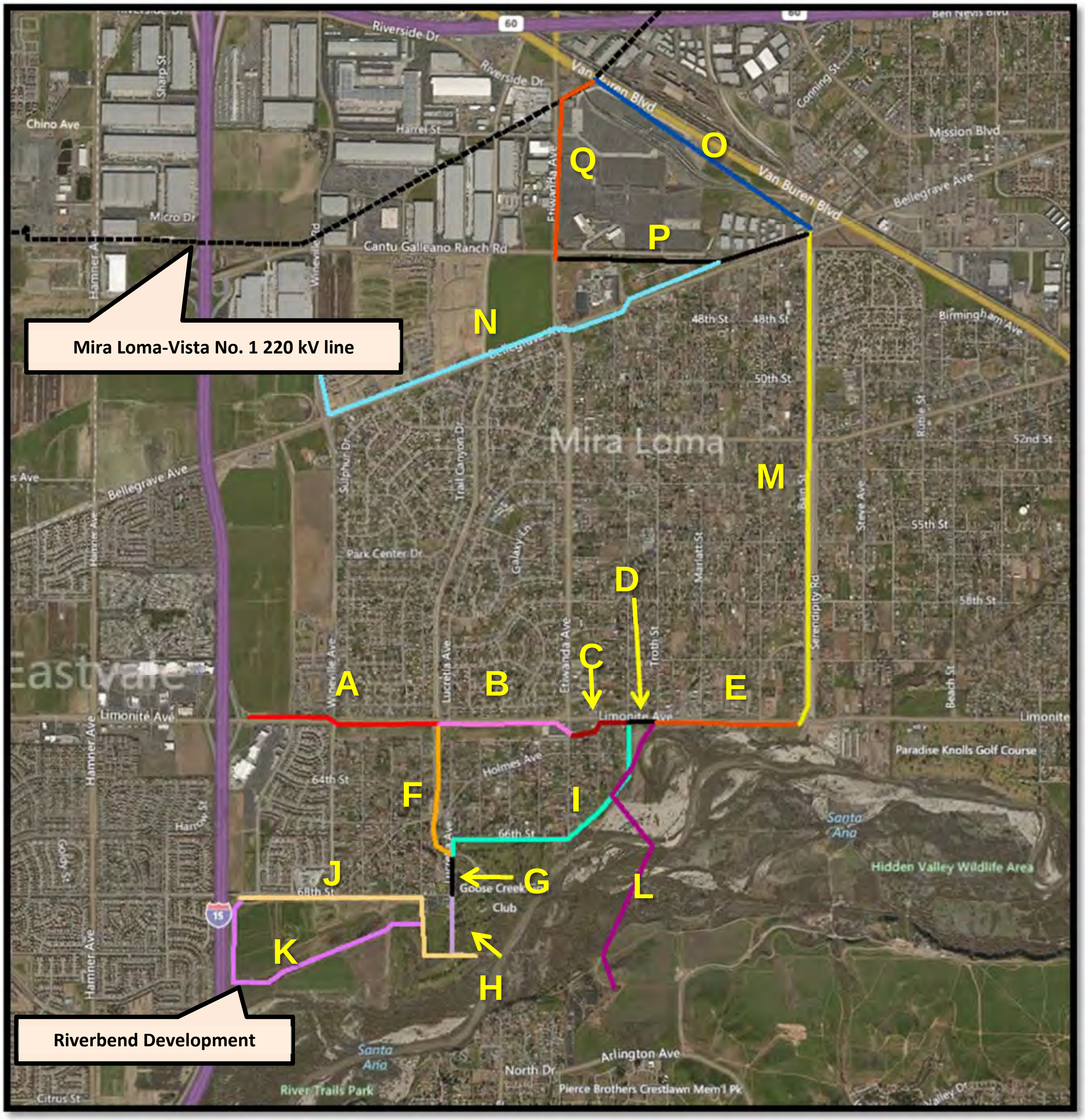
Key North-South Segments:

Key north-south segments were defined as those that provided the north-south foundation for multiple segment groupings to connect the RTRP's transmission line located south and east of Riverbend area, to the Mira Loma-Vista No. 1 200 kV line north of the Riverbend area. For this study, key north segments included:

- I-15 - RTRP Preferred Project.

- Segment M – Bain Street

Figure 4 – Riverbend Area Segments for Alternative Segment Re-Route Study

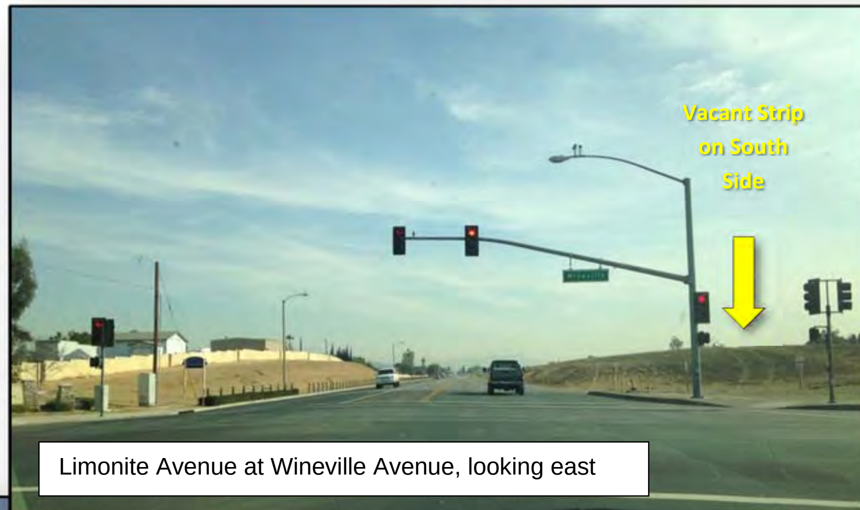


3.2 Limonite Segments

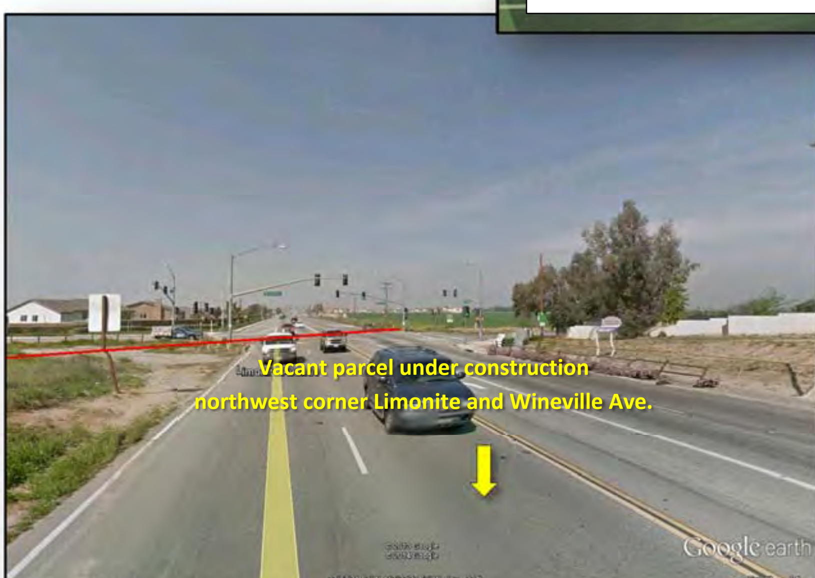
Limonite Avenue is a key east-west street. It was broken into segments, based on individual characteristics along the road.

3.2.1 Segment A - Limonite 1 (I-15 to Flood Control Channel).

Between the Flood Control channel (the eastern segment terminus) and Wineville Avenue (the western segment terminus), the TSPs would be set on the south side in a vacant strip that is approximately 440 feet wide. At the intersection of Wineville Avenue and Limonite Avenue near I-15, the segment would need to cross into the vacant land on the north side of Limonite Avenue due to the presence of residential development on the south side of Limonite Avenue. Construction appears to have proceeded in the vacant area on the north side of Limonite Avenue between Wineville Avenue and I-15. The area is zoned residential.



Limonite Avenue at Wineville Avenue, looking east



Limonite Avenue east of Wineville Avenue, looking west

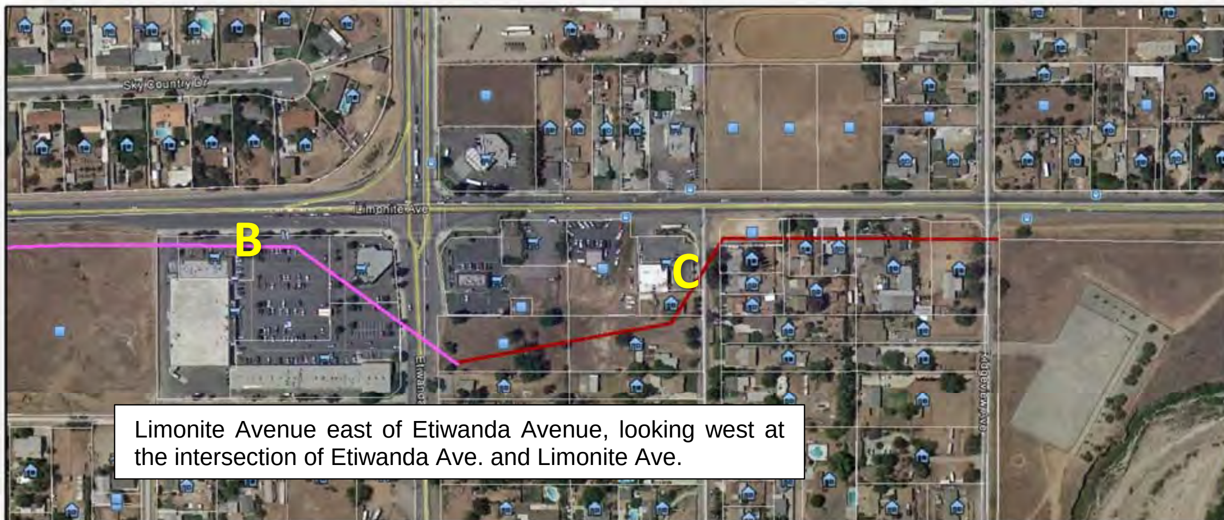
3.2.2 Segment B - Limonite 2 (Between Flood Control Channel and Etiwanda Avenue)

This segment encompasses a four-lane roadway with a vacant section of land on the south side, approximately 440 feet wide, that extends along Limonite Avenue, to Etiwanda Avenue. At Etiwanda Avenue, there is a small shopping center; east of Etiwanda Avenue, Limonite Avenue reduces to two lanes.

Limonite Avenue looking toward the intersection of Limonite Avenue and Etiwanda Avenue

3.2.3 Segment C - Limonite 3 (Between Etiwanda and Ridgeview)

This section is developed with low-density residential and small commercial. Additionally, the roadway is only two lanes. Construction in this segment would impact several existing homes and small businesses along the south side of Limonite Ave.



Limonite Avenue east of Etiwanda Avenue, looking west at the intersection of Etiwanda Ave. and Limonite Ave.

3.2.4 Segment D - Limonite 4 (Ridgeview to Troth)

Vacant; Santa Ana River to the south. The existing Mira Loma-Bain-Pedley 66 kV line crosses north-south at Troth Street.

Limonite Avenue east of Ridgeview, looking east toward the existing Mira Loma-Bain-Pedley 66 kV line

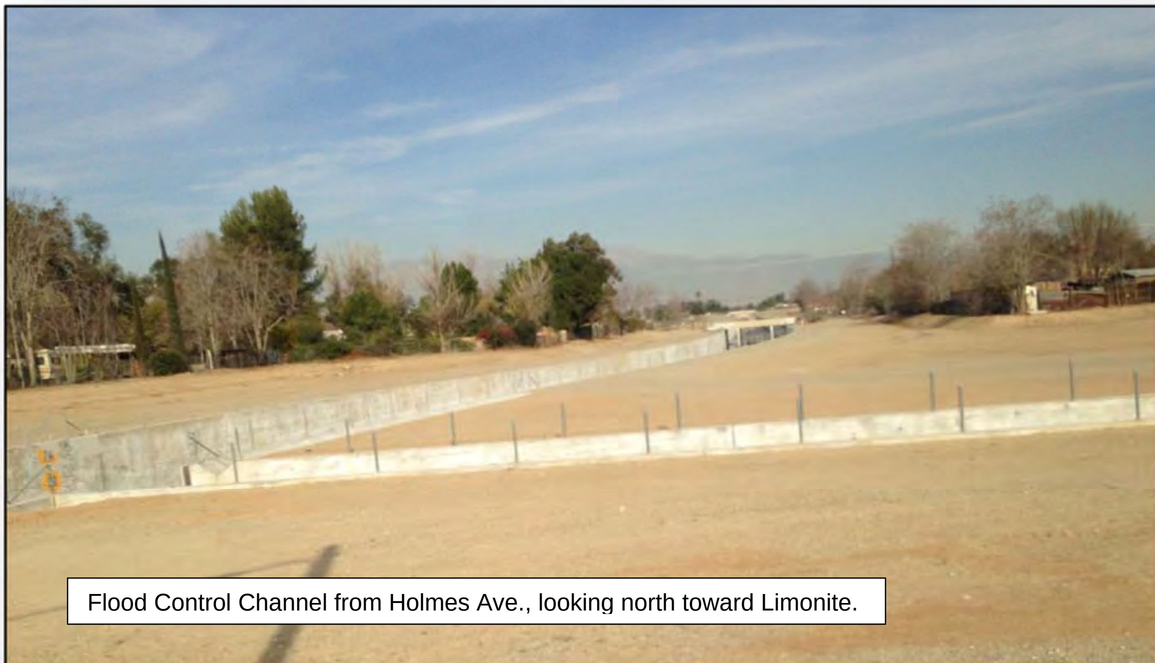
3.2.5 Segment E - Limonite 5 (Troth Street to Bain Street)

Vacant; Santa Ana River on south side.

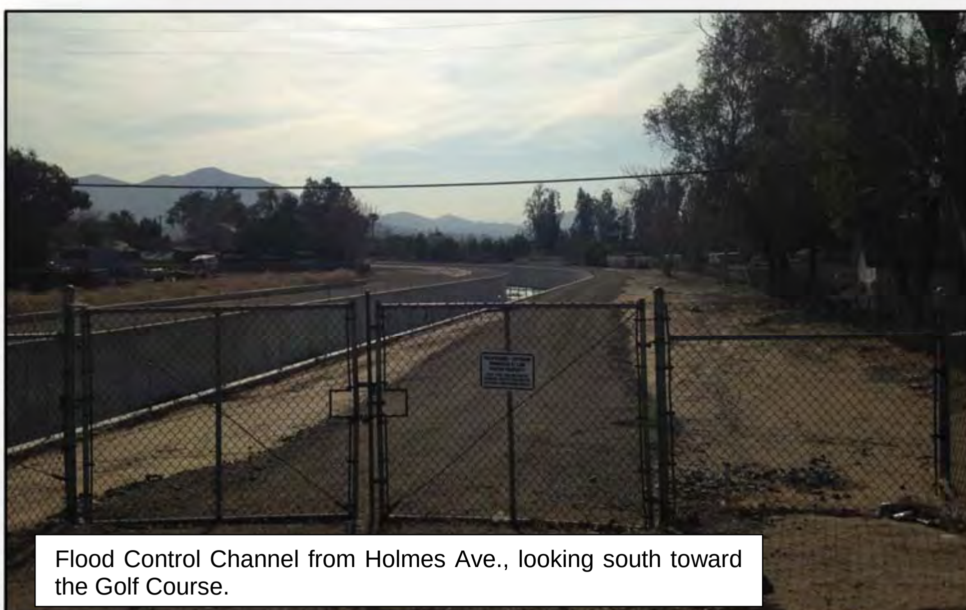
Limonite Avenue east of Troth Street, looking east toward Bain Street

3.3 Segment F - Flood Control Channel (Between Limonite and Golf Course)

This segment would follow the flood control channel between the Goose Creek Golf Course on the south end to Limonite Ave. on the north end. The main flow area of the channel is primarily concrete-lined. Access roads exist on each side of the concrete channel – between Limonite and Holmes Ave., the access roads are primarily dirt; between Holmes and the Golf Course, the access roads on both sides of the channel are paved.



Flood Control Channel from Holmes Ave., looking north toward Limonite.



Flood Control Channel from Holmes Ave., looking south toward the Golf Course.

3.4 Segment G - Lucretia Ave - Golf Course to Flood Control Channel

A golf course and road shoulder lie on the east side of Lucretia, while an existing distribution line lies on the west side.

(Looking north from golf course service entrance off Lucretia Ave)

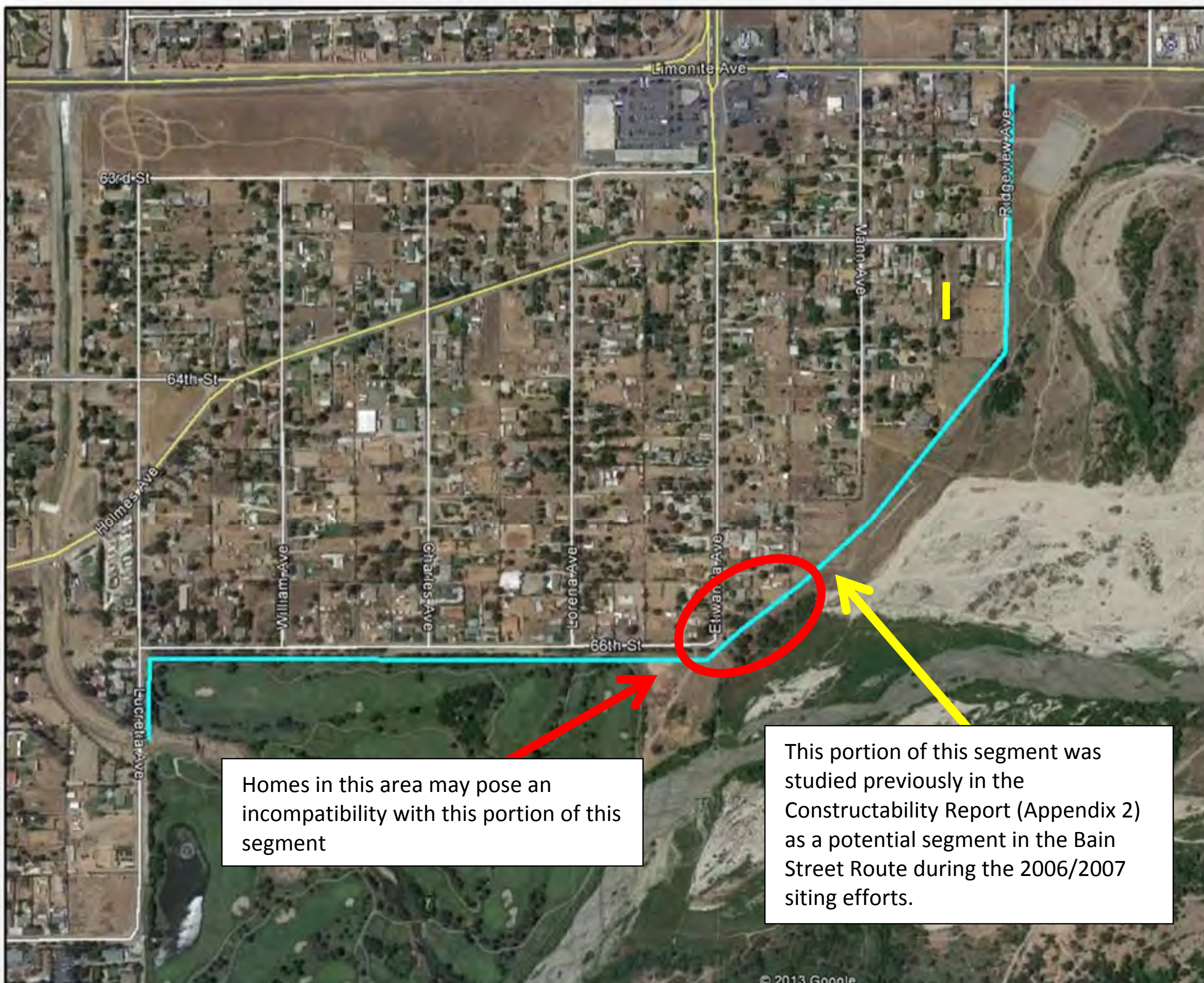
(Looking south from the flood control channel toward the golf course service entrance; the golf course is on the left side of photo; distribution and subtransmission lines are present in the rear left of photo).

3.5 Segment H - Existing 66 kV ROW in Golf Course

This segment would still use the existing proposed structure JA2/JB1 as its origination point in the golf course, on the eastern side of the Santa Ana River. Alignment then uses the existing Mira Loma-Corona-Pedley 66 kV ROW to 68th Street. Use of this segment would require one of the following options: 1) relocation of Mira Loma-Corona-Pedley 66kV, two distribution circuits, and telecom to either a different alignment; 2) relocation of existing 66 kV, distribution and telecom facilities to all underground in the golf course; or 3) use a 3-circuit structure on existing ROW for 220 kV and 66kV (relocate distribution and telecom either through Golf Course, underground, or somewhere else).

3.6 Segment I - "Golf Course North"

Begins at Flood Control Channel on Lucretia Ave, along Golf Course north boundary that follows the south side of 66th Street; continues northeast at 66th Street and Etiwanda Avenue, following behind homes along Etiwanda Avenue to Ridgeview Avenue and north at Ridgeview to Limonite. The portion of this segment on the corner of Etiwanda Avenue and 66th Street is within a proximity to homes, and may pose an incompatibility with residential uses. (Note: a portion of this segment, from Ridgeview to Limonite, was previously studied within the April 2008 *Constructability Report*, attached here as Appendix 2).



Excerpt from the 2008 Constructability Report (Appendix 2). This portion of the current Segment I was identified for study but dismissed due to biological issues.

Bain Street Route – Alternate - Issues

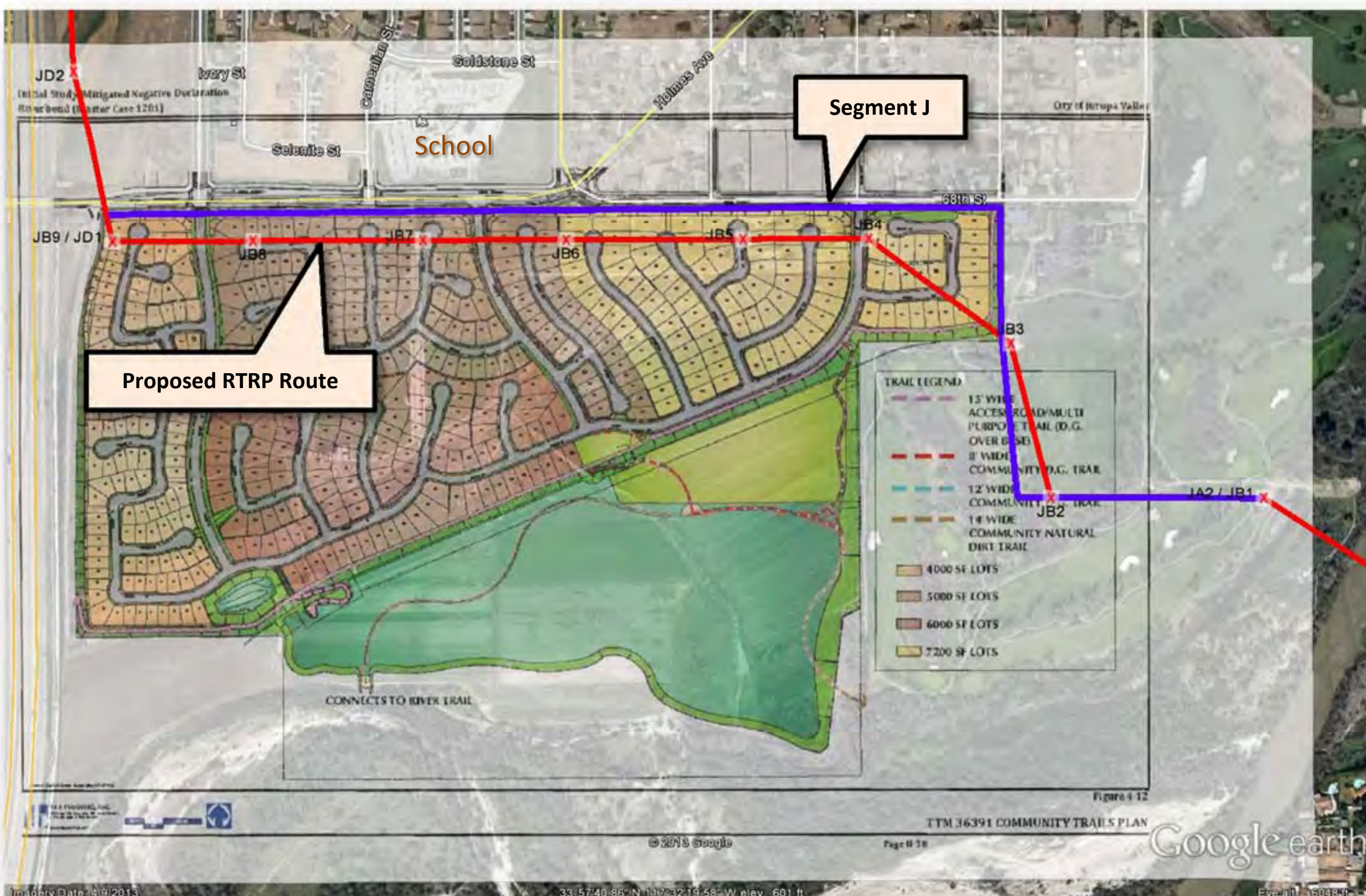
8

Segment I would place the line on the south side of 66th Street, requiring removal of the large trees in the left side of the above photo, as well as tree removal along north side of golf course. Would likely require relocation of the distribution (right side of photo).

Segment I would place the line within proximity to the homes near the intersection of Etiwanda and 66th Street (back of photo) such that this portion of the segment may pose an incompatibility with residential uses. Also, Santa Ana River low flow channel is adjacent to 66th Street, as shown in the right of the photo.

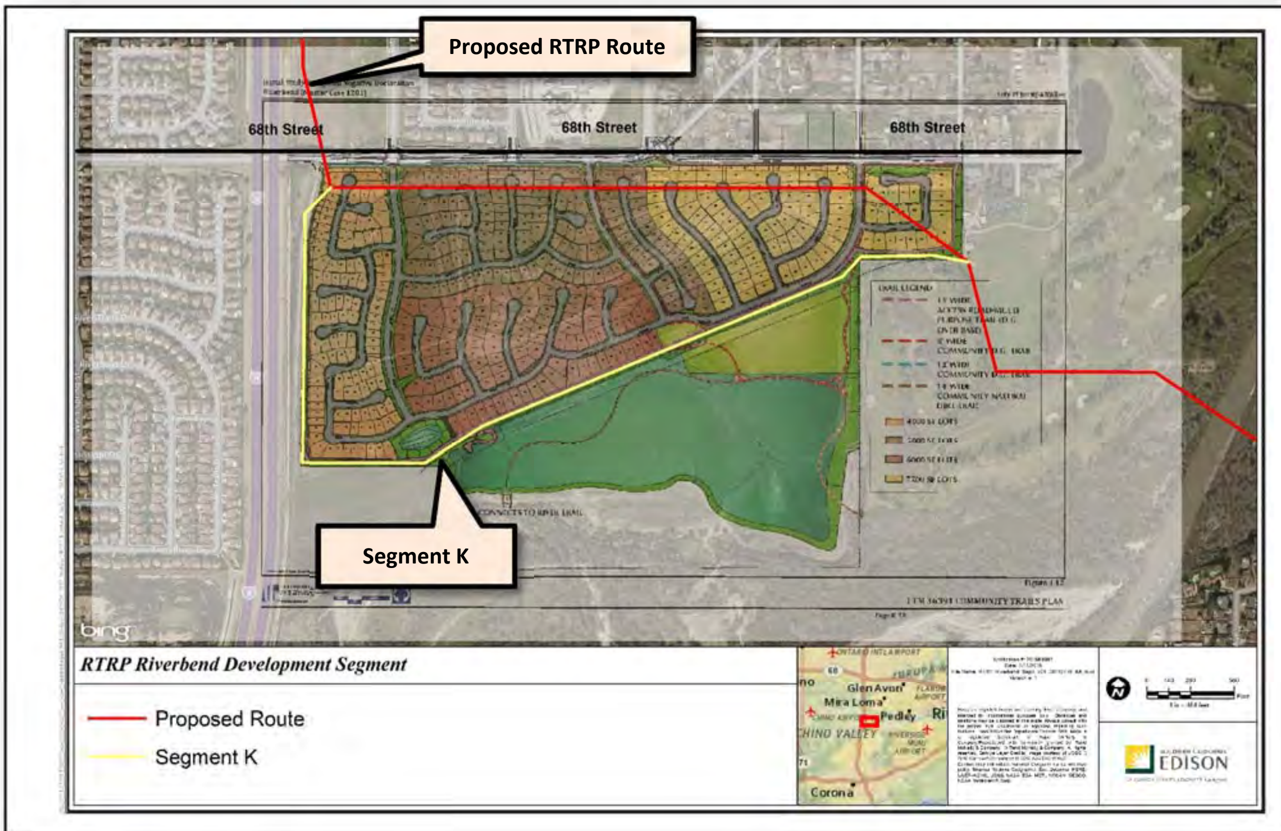
3.7 Segment J - "Riverbend East and North Fringe" (modification of existing segment - south side of 68th Street)

This segment crosses through the golf course using the proposed tower locations JA2/JB1, a slightly relocated JB2, then turn north, to traverse between proposed Riverbend development and the Golf Course, to 68th Street. This segment would then turn west to traverse along the south side of 68th Street, as close to the road/franchise area as possible in an effort to be more compatible to the residential uses proposed for along 68th Street. SCE does not have survey data on the actual lot and home placement in which to determine the number of residential lots that may be incompatible with the segment alignment. However, placement of the TSPs within or adjacent to the franchise area would likely result in one side of the conductor overhanging into the 68th Street traveled way. A portion of this segment would also be approximately 120 feet from the Louis Vandermolen Fundamental Elementary School located on 68th Street, between Carnelian Street and Wineville Avenue. Additionally, to maintain subtransmission/transmission separation requirements, the existing 66kV subtransmission line located on the north side of 68th Street, also would need to be relocated to within the street (underground) or re-routed, depending on the final design of this segment of the 230 kV line.



3.8 Segment K - Riverbend South

This segment would cross the Santa Ana River at the Goose Creek Golf Club, at the location described in the RTRP EIR. Once across the Goose Creek Golf Course at Riverbend's eastern edge, the 230 kV line would proceed west, southwest, and then west again along the southern edge of Riverbend's proposed tract homes, but north of an undeveloped green space between Riverbend and the Santa Ana River channel. The 230 kV line then would continue until just east of I-15, where it would turn north to 68th Street, where it would continue as the RTRP transmission line as described in the EIR.



“Segment K” could potentially enhance RTRP’s compatibility with the Riverbend development plan as identified in the Riverbend MND. However, Segment K may result in increased environmental impacts, due to the proximity of the Santa Ana River to the southern edge of the golf course where the new poles would likely be constructed. These impacts may include but are not limited to biological, geological, and hydrologic impacts when compared with RTRP’s proposed segment through Riverbend.

Despite any general increase in environmental impacts with Segment K, it is unknown whether Segment K would actually result in new significant environmental impacts and/or a substantial increase in the severity of a documented significant impact under CEQA at this time.

Project team comments regarding Segment K included the following:

- Technical Considerations: Due to its proximity to the Santa Ana River, Segment K would require additional geotechnical, hydrological, and engineering studies to determine constructability and pole placement, before this segment can be validated as technically feasible.

- Biological Considerations: The upper terraces of the bank of the Santa Ana River abuts the Goose Creek Golf Club southern property boundary where the poles would likely be constructed. This area contains sensitive vegetation and is home to sensitive bird species. Due to the proximity of this portion of Segment K to the Santa Ana River and the Riverside Multiple Species Habitat Conservation Plan (MSHCP) areas, Segment K may trigger additional permitting and impacts to biological resources associated with the Santa Ana River.

- Aesthetics: Based on Riverbend’s development plan identified in the MND, Riverbend proposes residential use in the northern two-thirds of the development. Distances from the homes closest to Segment K would depend on final engineering of both the Riverbend development and RTRP. However there are no significant designated viewsheds in the area and other electrical line facilities are already present in the area, suggesting that any aesthetic impacts from RTRP on adopted viewsheds will be less than significant. As discussed in the RTRP EIR, there is the potential for impacts to unofficial viewsheds along the Santa Ana River south of Riverbend.

- Land Use/Zoning Change Compatibility: SCE understands the southern portion of the Riverbend development site has historically been used for agriculture. According to Riverbend MND, the development plan authorization included a change in the land use designation for the southern portion of Riverbend, converting it from “OS-R – Open Space Recreation” and “OS-W – Water” to “OS-CH - Open Space Conservation Habitat” and “OS-W – Water.” The Riverbend site plan identifies these “OS” areas as being used for stockpile and borrow and open space. The MND does not identify that these areas will be revegetated or utilized for sensitive species mitigation or set-aside. Therefore, based on SCE’s current understanding of the

Riverbend Project, SCE preliminarily considered Segment K to not significantly impact land uses and/or zoning as identified in the MND.

- Additional ROW Acquisition: Segment K's potential need for additional property along Riverbend's western edge (adjacent to the I-15 and which is proposed for residential use) is not precluded. Preliminary mapping indicates that there is potentially sufficient ROW to support Segment K between I-15 and 68th Street. However, any overlap between Segment K and the areas preliminarily identified for residential use by Riverbend may depend on final engineering and design of both projects.

Figure 5C – Two Approaches To The Pedley Substation Are Possible.

Excerpts from Constructability Report *(Appendix 2). This portion of the current Segment K was identified in the 2006/2007 but not carried forward. "15"circled in the left graphic is a "Land/Water Conservancy Sensitive Area." The yellow arrows in the below graphic identify where the proposed segment could be placed in the golf course, as reported in the Constructability Report.*

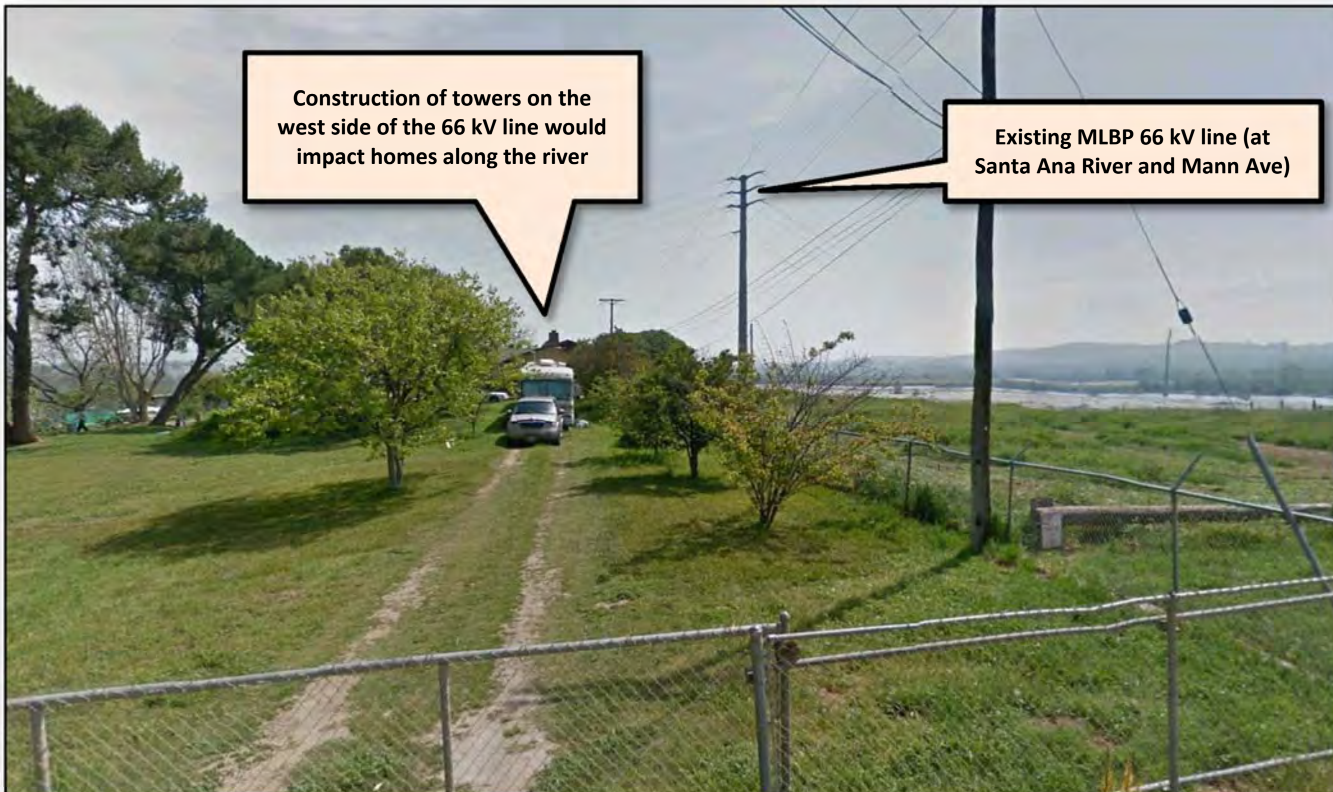
Right Photo: View of the golf course looking east, from a point on the golf course adjacent to the Riverbend development property boundary. The golf course and perimeter road appear in the left and right foreground; dense riparian vegetation trees of the Santa Ana River line the right side of the photo, adjacent to the golf course road, and continues along the edge of golf course from the foreground to the background. Segment K could be placed on the right side of the photo, within or adjacent to the riparian vegetation.

Figure 10B – This Photograph Is Looking West Adjacent To The Santa Ana River area. The Santa Ana River Is On The Left Hand Side Of This Figure and The Golf Course Is Apparent On The Right Hand Side Of This Picture. The Proposed Transmission Line Would Extend East And West And Be Located On The Golf Course Adjacent To The Area of The Reinforced Embankment in The Center of The Picture.

3.9 Segment L - Mira Loma-Bain-Pedley 66 k ROW 1 (Santa Ana River)

This segment alignment would mirror the existing Mira Loma-Bain-Pedley 66 kV line (MLBP) alignment. Currently, lightweight steel poles carry both the MLBP and a distribution circuit. The new 230 kV alignment would likely be placed adjacent to, on the west side of, the MLBP alignment. In order to utilize the existing access MLBP access roads and pad areas, the new double-circuit TSPs would be constructed adjacent to existing pole locations to the extent possible. However, because the 230 kV spans are greater than the 66 kV spans, there may be at least one span that would need to be greater than 1,000 feet to avoid placing a TSP in the direct low flow area of the Santa Ana River. As with the existing MLBP, permits from multiple resource agencies would be required, along with mitigation to offset impacts to the river from both construction and maintenance. Additionally, a portion of the transmission line segment is in direct proximity of several residential properties, as well as the other subtransmission and distribution facilities, and therefore may pose an incompatibility with those uses.

Segment L (Continued)



3.10 Segment M - Bain Street

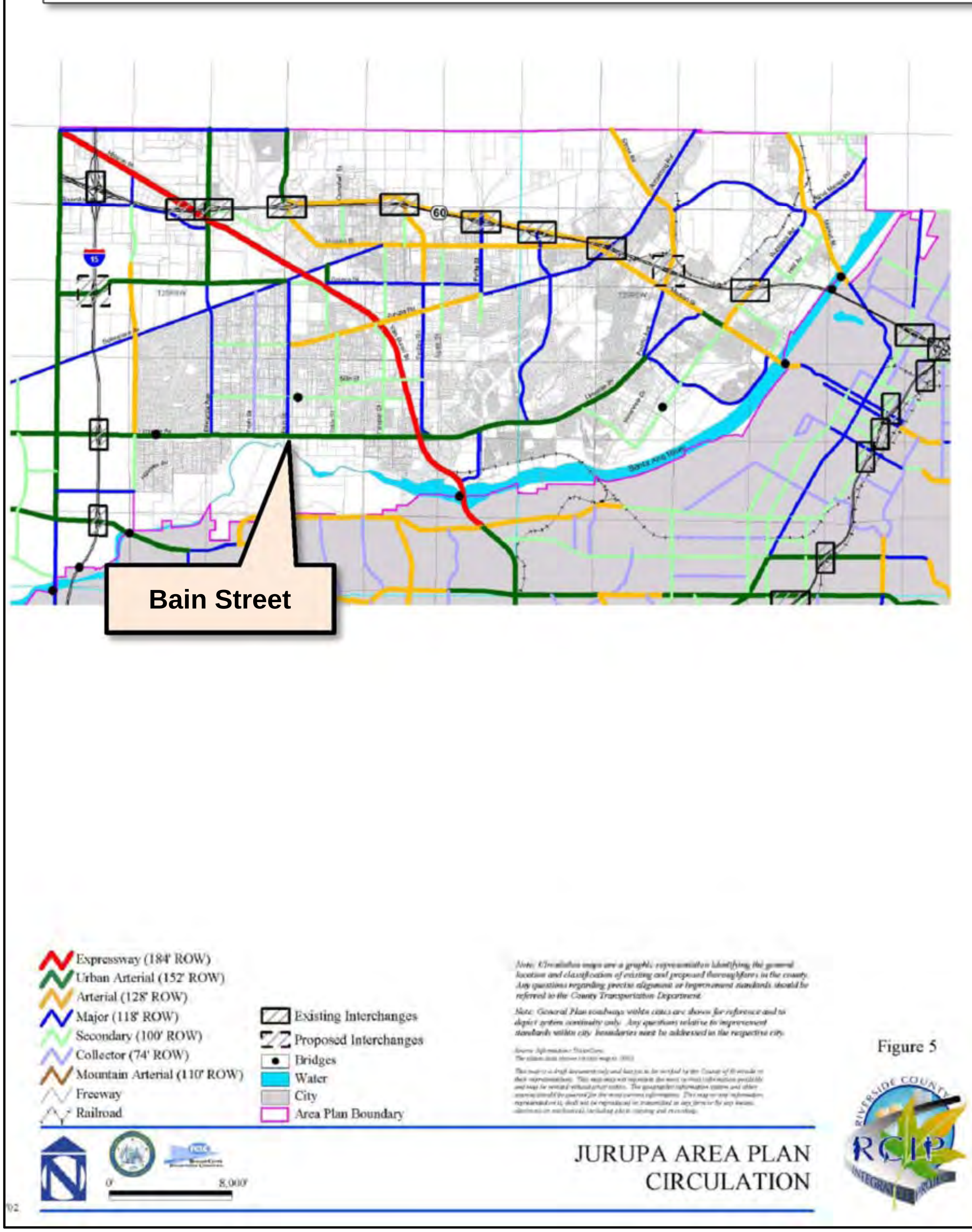
Bain Street, a two-lane road approximately 35 feet wide including road shoulders, was identified because of the availability of approximately 56 feet of road shoulder on the east side. The Jurupa Area Plan, which is part of the Riverside County General Plan, identifies Bain Street as a Major road, which, per plan, would require approximately 118 feet of ROW (an additional approximately 30 feet). Although SCE had no information on if, or when, such a widening project would be scheduled, the widening necessary to conform to the Jurupa Area Plan designation would conflict with the ROW needs for RTRP line.

During the original RTRP siting study, a segment along this same section of Bain Street was also identified as potentially being a suitable segment for the same reasons identified by the current project team. However, the original RTRP siting study (*see* Appendix 1) dismissed the Bain Street segment due to the conflict with the County of Riverside's circulation designation, as well as significant public opposition.

(Top Photo): Bain Street is approximately 90 feet wide from the edge of pavement on the left side to the flood control channel fence on the right side of the photo. Ultimate width per the Area plan is 118 feet.

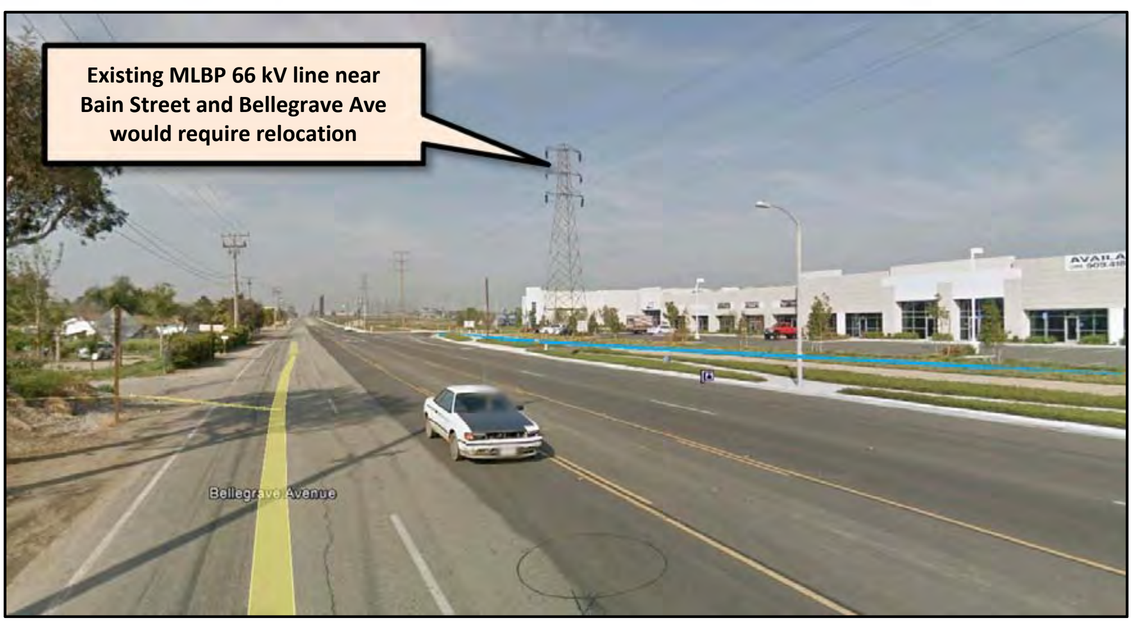
(Right Photo): Currently, a trail exists along the east side of the road, where the new TSPs could be placed. Subtransmission lines cross Bain near Jurupa Avenue; would require standard protection measures. Route was met with significant public opposition during the original RTRP siting studies in 2006/2007.

Figure from Jurupa Area Plan – Circulation Map designates Bain Street as a "Major" road, with an ultimate ROW of 118 feet.



3.11 Segment N – Bellegrave Ave.

The segment travels along Bellegrave Ave. between Bain Street and proposed structure JD22. From Bain Street, the proposed 230 kV line would utilize the north side of Bellegrave to bypass homes, then cross to the south side to bypass the school on the north side, and then cross back onto the north side of Bellegrave continuing westerly to the proposed structure JD22. A portion of the Mira Loma-Bain-Pedley 66 kV line (MLBP) also exists on the north side of Bellegrave Avenue, and would require relocation in order to maintain subtransmission/transmission separation. This segment is dependent on Bain Street as the primary north-south segment leg.



3.12 Segment O - Union Pacific Rear Lot to Mira Loma-Vista No. 1 220 kV

This segment follows along the 66 kV ROW/Bain Street, northwest through the rear portion of the Union Pacific lot. The lot appears to be used for cargo storage. This segment would require acquisition of property (and potentially condemnation) or a non-standard license through the Union Pacific parking lot. Additionally, this segment is dependent on Bain Street which would have insufficient ROW.

3.13 Segment P - Cantu-Galleano Ranch Road + Existing 66 kV ROW

This segment, also dependent upon Bain Street, would travel between the existing Mira Loma-Bain-Pedley 66 kV ROW between Bain Street and Cantu-Galleano Ranch Road, and the existing 66 kV ROW along Cantu-Galleano Ranch Road, between the end of Cantu-Galleano Ranch Road and Etiwanda Ave. The segment would have several potential options: 1) Potentially place new TSPs on north side of Cantu-Galleano Ranch Road, while leaving the 66 kV on south side; 2) place the new TSPs in Union Pacific storage lot on north side; or 3) place new TSPs in existing 66 kV ROW on south side, and relocate the 66 kV.

3.14 Segment Q - Etiwanda (Union Pacific Front Lot)

From corner of Etiwanda Ave and Cantu-Galleano Ranch Road, the 230 kV line would travel north but through the front portion of the storage lot owned by Union Pacific, to the Mira Loma-Vista No. 1 220 kV. The segment could not use Etiwanda Avenue as its north-south segment leg because there are existing sidewalks and not enough room without conductor swinging over the roadway. Therefore, this segment depends on Bain Street as the north-south segment leg.

Chapter 4: SEGMENT SCORING

SCE uses a systematic ranking method to evaluate each segment in order to develop segment groupings for routes (or partial routes in the case of this study). This ranking system for the Siting Process uses a set of factors that contain criteria unique to various subject matter areas. The ranking method is based upon the principles discussed in SCE's *Transmission Environmental Guide* (attached hereto as Appendix) which was prepared pursuant to the CPUC Request No. 111 of June 20, 1973, requesting utilities to develop a written set of standards for design and construction of transmission facilities.

The factors and criteria are designed to serve as "signals" of key issues that may affect a specific location's constructability, environmental compliance, and/or social acceptance if developed as a transmission line.

Project team members who have expertise in the specific subject matter areas evaluate each segment based on this standard, pre-defined system. Each evaluation uses a combination of field observation, desktop database research, and, in the case of the community evaluation (when applied / or where applicable), input from briefings with local government officials.

The specific factors used and their weights for transmission lines are provided in Table 1.

4.1 Segment Scores

The designated subject matter expert assigned a numeric value to each criterion. The numeric value ranges from 1 to 5, with 1 being best, and 5 being worst. A value of "F" would be a fatal flaw for that criterion. Therefore, a high segment score would represent a segment with the most concerns.

The numeric values from the SMEs are translated into a "segment score" based on the weight of the criteria. The segment score summary for the RTRP re-route is provided in Table 2. Scores and comments from the SMEs are located in Appendix – *Segment Scores and SME Comments*.

Table 1 Segment Scoring Factors and Weights

= Low Weight (.25) = Med Weight (.50) = Med-High Weight (.75) = High Weight (1.00)

Aesthetics	***EMF***
Visual Character / Quality	Setbacks from Prioritized Land Uses
Locally-Valued Places	***Geology / Geotechnical***
Impacts to Scenic Vistas	Adverse Soil Conditions
Scenic Highways	Erosion Potential
Biology	Flooding Potential
Wildlife Corridors	Slope Stability / Landslide Hazards
Avian Collision	Liquefaction Potential
Permitting Time Required	Fault Rupture Hazard Zones
Water Bodies	Soil Contamination
Special Status Species	***Transmission Project Delivery (construction and operations)***
Civil Engineering – Access Roads	Slope of Segment for Access Roads
Access to the Segment for Construction / Operations	Remove / Replace Existing Structures
Overall Terrain	Constructability-Pole/Tower Design for Transmission
Access Roads Needed for Construction	Constructability - Permits and Restrictions
Permits & Restrictions	Surface and Subsurface Obstacles (Visual Observation Only)
Surface and Subsurface Obstacles	Difficulty Scheduling Outages on Existing Lines to Proceed with Construction
Transmission Engineering	Access to the Segment for Construction
Slope of Segment	Access Roads Needed for Construction
Pole / Tower Design	Availability of ROW for Construction
Availability of ROW for Operations & Maintenance	***Land Acquisition/Government Lands***
Terrain along Segment	Ownership Type
Access to Segment for Operations & Maintenance	Property Rights (Existing or Need to Acquire)
Community	***Land Use***
Potential Site-Specific Stakeholders (schools, churches, etc.)	Zoning / General Plan Land Use on the Site
Community Development Guidelines	Zoning / General Plan Land Use(s) Surrounding the Site
Current / Past Controversy At or Near the Site	Existing Land Use(s) on the Site
Planned Future Development Near the Site	Existing Land Use(s) Surrounding the Site
Local Gov't. Attitude toward Infrastructure Projects	Special Districts, Specific Plans, Re-development Project Area
Cultural Resources	Farmland / Agricultural Conservation
Paleontological Resources	Airport Land Use Plan
Cultural Resources	Grading Permit & Additional Improvements
Cultural Resources Permitting Time	***Subtransmission***
Native American Resource Issues	Difficulty in Scheduling Outage
	Remove/Relocate/Reconfigure Existing

4.2 Segment Elimination

To develop a top pool of segments, the project team discussed all segments to determine if they should be eliminated or retained for consideration. This section describes the segments that were eliminated through team review of the scores and team discussion.

4.2.1 Segment A – Limonite 1 (flood control channel to I-15)

In this segment, an approximately 440-foot-wide vacant strip exists on the south side between the flood control channel and Wineville Avenue. However, between Wineville Avenue and the I-15, the south side contains a residential development. The north side of the street is vacant, and the 230 kV line could cross from the south to the north side of the street. Construction appears to have proceeded on the vacant north parcel. SCE verified that the parcel is zoned for residential. SCE distribution planning also reported an active service application for a residential tract at this location. Therefore, the project team eliminated this segment because of the advanced stages of construction for the observed residential development.

4.2.2 Segment F – Flood Control Channel between Lucretia Avenue and Limonite Avenue

Segment F scored relatively well for most criteria, except for transmission and property acquisition. The flood control channel in this section is concrete-lined and contains a mixture of unimproved access roads and paved access roads. Low-density rural residential exists on both the east side and west side of the channel; the homes were generally closer to the streets while the back lots abutted the flood control channel. The back lots generally had small pens for animals such as goats and horses. For high-voltage lines SCE prefers to obtain full ownership, and it was unlikely that the County of Riverside's flood control administration would give up ownership of the flood control channel. Additionally, pole placement to completely avoid overhang into back yards may not be possible. The pole placement would also likely interfere with the maintenance of the flood control channel. Therefore, the project team eliminated Segment F from further consideration.

4.2.3 Segment J -Modification of Existing RTRP Segment through Riverbend

This proposed segment was an attempt to modify the segment of the proposed 230 kV route that overlaps with a portion of the Riverbend development. However, this alignment would result in the relocation of the existing subtransmission line, at least one side of conductor hanging over the traveled way of 68th Street, and likely needing to position the TSPs in, or immediately adjacent to, franchise - all of which still may not improve the compatibility between this RTRP segment and Riverbend. Therefore, the project team eliminated it from further consideration.

4.2.4 Segment L – Mira Loma-Bain-Pedley 66 kV ROW in Santa Ana River

The project team eliminated this segment for a variety of reasons. First, transmission engineering expressed significant concerns of exposing the TSP footings of a 230 kV line to the erosional forces of the Santa Ana River. They noted that to avoid placement of footings directly in the more active low-flow channel would require a span of over 1,000 feet, which is not preferred for technical and engineering reasons. SCE noted that although the existing 66 kV line is located within the Santa Ana River, the operations and maintenance personnel have reported often losing the maintenance roads and subtransmission pole footings due to the erosional forces of the Santa Ana River. Species permits and mitigation would likely be necessary for construction and maintenance of the TSPs due to their location being in a biologically sensitive area of the Santa Ana River. The team also noted that a portion of the segment along Ridgeview would be in direct proximity to existing homes and new rights-of-way would be required, which would cause an incompatibility between this portion of this segment and residential uses.

4.2.5 Segment M – Bain Street

Bain Street, an approximate 2-mile segment, was considered a key segment as it provides a key north-south alignment alternative to the proposed RTRP I-15 route. A route using Bain Street was also studied in the 2006/2007 RTRP siting efforts. From the scores of this current siting effort and apart from the RTRP EIR preferred route, Bain Street would likely have the least environmental impacts. Aesthetically, the area is low-density rural residential, and does not afford significant views. The flood control channel already divides that area of the community. Mira Loma Middle School exists approximately 150 feet east of the proposed line, just north of Jurupa Road.

From a transmission design perspective, there were two locations where a natural gas pipeline and an existing 66 kV line would cross perpendicular to a new transmission line. These crossings would require that protection measures be included in the 230 kV tower/conductor design to ensure safety and compatibility between the transmission conductor and the other utilities. SCE utilizes standard engineering protection methods for crossings with other utilities and subtransmission, so these crossings would be technically possible. There was concern however relative to designing the line to avoid a water pumping station at the corner of Limonite Avenue and Bain Street.

Because Bain Street was a critical segment and was reviewed during the previous siting effort, the team reviewed the conclusions of the past reports and available newspaper clippings, in order to compare those concerns with the current conditions. Highlights from the previous siting efforts included opposition from the Bain Street residents, citing EMF and aesthetic concerns. During this siting effort, SCE's EMF specialist stated that EMF was not a significant concern. To evaluate aesthetics, the team considered the Bain Street viewshed and the I-15 viewshed. During the past siting effort, residents indicated that the I-15 in the Jurupa Valley afforded expansive views of agricultural fields and other landforms. The team discussed that transmission lines along freeways and interstates are very common, and may be more accepted than if they exist within a low-density residential neighborhood.

Additional concerns expressed included the protection measures for the crossing of the two utilities would likely mean taller towers in those two locations. Also, the use of Bain Street would likely conflict with the Jurupa Area Plan, which is part of the Riverside

County General Plan. The Jurupa Area Plan identifies Bain Street as a "Major," road with an ultimate width of approximately 118 feet. Because the current roadway and dirt shoulder on the east side is only approximately 90 feet wide, Bain Street's planned ultimate width (as described in the Jurupa Area Plan) would conflict with the ROW needs for the RTRP 230 kV transmission line. In light of these considerations, the RTRP project team eliminated this segment from further consideration.

Table 2 - -Segment Scores

Subject Matter Area	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
AESTHETICS	5.75	4.75	4.75	5.75	5.75	5.75	6.25	7.25	8.00	5.50	10.00	8.50	5.25	4.50	3.25	3.25	3.25
BIOLOGY	3.00	3.00	3.00	3.00	4.50	3.00	3.50	5.25	5.25	3.00	10.00	12.25	3.00	3.00	3.00	3.00	3.00
CIVIL ENGINEERING - ACCESS ROADS	10.00	8.50	8.50	4.50	10.50	7.50	4.50	6.50	4.50	8.50	13.00	14.00	4.50	8.50	8.50	6.50	6.50
COMMUNITY	8.25	8.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25
CULTURAL RESOURCES	2.75	3.25	2.25	3.25	4.25	2.75	2.75	3.75	4.25	3.75	3.75	4.25	2.25	1.75	1.75	1.75	1.75
EMF	1.00	1.00	1.00	1.00	0.75	1.00	0.75	0.50	1.00	1.25	0.50	0.50	1.25	1.00	0.75	1.25	0.75
GEOLOGY / GEOTECH	5.00	5.00	5.00	5.00	9.50	9.00	5.00	7.00	9.50	7.00	11.00	13.00	5.00	5.00	5.00	5.00	5.00
GOVERNMENT LANDS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LAND ACQUISITION	3.00	3.00	5.00	2.00	2.00	3.00	3.00	3.00	4.00	5.00	2.00	3.00	5.00	5.00	3.00	5.00	3.00
LAND USE	8.00	8.00	5.75	6.75	7.75	8.50	8.50	9.00	8.00	6.25	9.00	9.00	9.25	4.75	4.25	6.50	3.75
SUBTRANSMISSION	25.75	25.75	25.75	5.00	1.00	1.00	5.00	5.00	5.00	100.00	1.00	1.00	1.00	1.75	1.00	28.75	4.00
TRANSMISSION ENGINEERING	10.00	11.00	14.00	11.00	11.00	13.25	14.00	13.00	11.00	13.25	16.50	11.00	14.00	11.00	14.00	11.00	14.00
TRANSMISSION PROJECT DELIVERY	16.00	15.25	15.25	14.75	14.75	17.00	17.50	24.50	18.50	23.25	25.50	24.50	17.00	14.75	0.00	17.25	14.75
Totals:	**99.50**	**97.75**	**98.50**	**70.25**	**80.00**	**80.00**	**79.00**	**93.00**	**87.25**	**185.00**	**110.50**	**109.25**	**75.75**	**69.25**	**52.75**	**97.50**	**68.00**

Chapter 5: Segment Group Re-Route Development

5.1 Segment Grouping

Irrespective of the individual segment elimination, all segments were grouped to form a potential re-route to improve potential compatibility in the Riverbend area. The team then reviewed this information to determine if, when viewed together, a previously eliminated segment should return to the pool for reconsideration.

Table 3 provides the possible segment groupings to form a re-route around the Riverbend development. Segment groupings were constructed beginning from the easternmost point, which were segments, K, J, H, and L, then configured directionally to connect to a RTRP proposed 230 kV tower location either along I-15 or at the Mira Loma-Vista No. 1 220 kV tap point.

The overall segment group scores are based on the individual segment scores, not considering the team's selection of individual segment elimination. The lower the score, the fewer the potential impacts, based solely on individual SME scores. Alternatively, the higher the score, the greater the potential impacts, based solely on individual SME scores. Segment Group 2 received the highest, or worst score; Segment Group 8 was the best scoring segment group.

After review of the various segment group configurations, the RTRP project team's review did not support the return of any previously eliminated segments to the pool for reconsideration.

Table 3 – Segment Group Configuration Scores

Segment Group ID	Segment Group	Overall Score based on Segment Scores	Segment Group Length (miles)
1	K	110.50	1.49
2	J	185.00	1.24
3	H G F A	90.49	1.93
4	H G F B C D E M O	76.54	5.90
5	H G F B C D E M N	78.17	6.87
6	H G F B C D E M P Q	82.80	6.71
7	H G I C B A	93.17	3.33
8	H G I D E M O	75.13	5.61
9	H G I D E M N	77.04	6.57
10	H G I D E M P Q	81.85	6.41
11	L E M N	81.11	6.09
12	L E M O	79.79	5.13
13	L E M P Q	86.42	5.93
14	L D C B A	102.19	3.07

5.2 Segment Group Elimination

After confirming the segment elimination and the segment grouping scores, the project team reviewed the segment groupings that could be carried forward (Table 4). The only segment group the team could carry forward was Segment Group 1 (Segment K), which would skirt the southern boundaries of the Golf Course and the adjacent Riverbend development. The rest of the segment groups were eliminated due to their dependency on key directional segments that were eliminated.

Table 4 – Segment Group Configurations Based on Segment Elimination

Segment Group ID	Segment Group	Overall Score	Eliminated/ Retained	Segments Eliminated Making Segment Group Configuration Not Feasible
1	K	110.50	Retained	
2	**J**	185.00	Eliminated	J – Modified Riverbend
3	H G **F A**	90.49	Eliminated	A – Limonite, F – Flood Channel
4	H G **F** B C D E **M** O	76.54	Eliminated	M – Bain, F – Flood Channel
5	H G **F** B C D E **M** N	78.17	Eliminated	M – Bain, F – Flood Channel
6	H G **F** B C D E **M** P Q	82.80	Eliminated	M – Bain, F – Flood Channel
7	H G I C B **A**	93.17	Eliminated	A – Limonite
8	H G I D E **M** O	75.13	Eliminated	M - Bain
9	H G I D E **M** N	77.04	Eliminated	M - Bain
10	H G I D E **M** P Q	81.85	Eliminated	M - Bain
11	**L** E **M** N	81.11	Eliminated	L- Santa Ana River, M - Bain
12	**L** E **M** O	79.79	Eliminated	L- Santa Ana River, M - Bain
13	**L** E **M** P Q	86.42	Eliminated	L- Santa Ana River, M - Bain
14	**L** D C B **A**	102.19	Eliminated	L- Santa Ana River, A – Limonite

5.3 Segment Group Selection

And though Segment Group 1 (Segment K) was the only one that was retained, the project team identified several environmental and engineering challenges that contributed to its relatively high score. Comments regarding Segment K included the following:

- Technical Considerations: Due to its proximity to the Santa Ana River, Segment K would require additional geotechnical, hydrological, and engineering studies to determine constructability and pole placement, before this segment can be validated as technically feasible.

- Biological Considerations: The upper terraces of the bank of the Santa Ana River abuts the Goose Creek Golf Club southern property boundary where the poles would likely be constructed. This area contains sensitive vegetation and is home to sensitive bird species (*see* Figure 5, Least Bell's Vireo Critical Habitat). Due to the proximity of this portion of Segment K to the Santa Ana

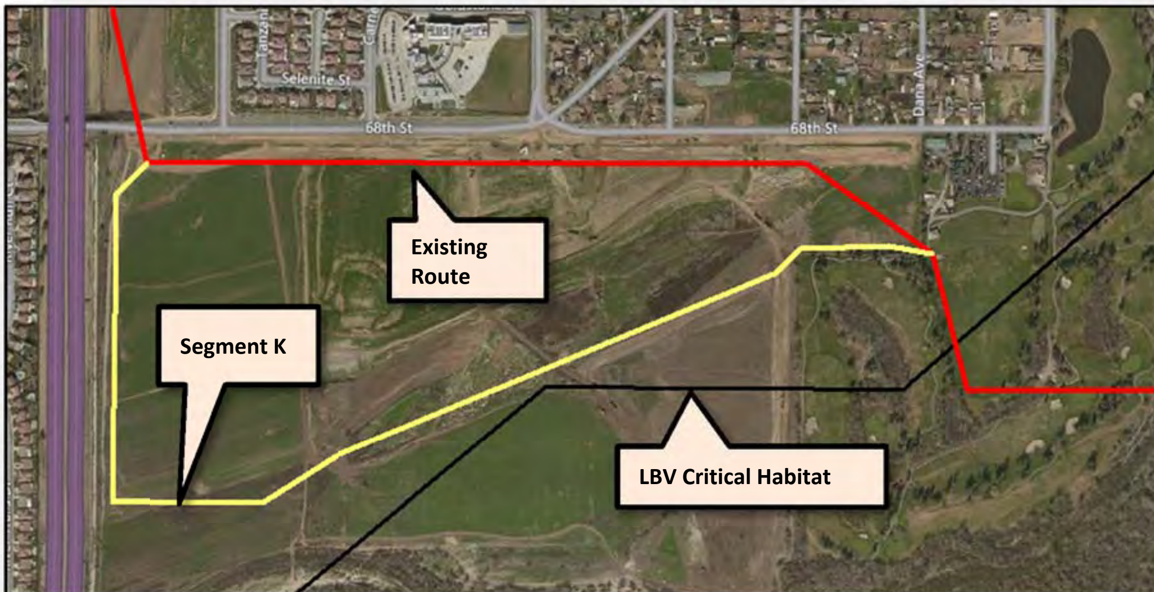
River and Riverside MSHCP areas, Segment K may trigger additional permitting and impacts to biological resources associated with the Santa Ana River.

- Aesthetics: Based on Riverbend's development plan identified in the MND, Riverbend proposes residential use only on the northern two-thirds of the development. Distances from the homes closest to Segment K would depend on final engineering of both the Riverbend development and RTRP. However there are no significant designated viewsheds in the area and other electrical line facilities are already present in the area, suggesting that any aesthetic impacts from RTRP on adopted viewsheds will be less than significant. As discussed in the RTRP EIR, there is the potential for impacts to unofficial viewsheds along the Santa Ana River south of Riverbend.

- Land Use/Zoning Change Compatibility: The southern portion of the Riverbend development site is currently being used for farming. According to Riverbend MND, the development plan authorization included a change in the land use designation for the southern portion of Riverbend, converting it from "OS-R – Open Space Recreation" and "OS-W – Water" to "OS-CH - Open Space Conservation Habitat" and "OS-W – Water." The Riverbend site plan identifies these "OS" areas as being used for stockpile and borrow and open space. The MND does not identify that these areas will be revegetated or utilized for sensitive species mitigation or set-aside. Therefore, based on SCE's current understanding of the Riverbend Project, SCE preliminarily considered Segment K to not significantly impact land uses and/or zoning as identified in the MND.

- Additional ROW Acquisition: Segment K's potential need for additional property along Riverbend's western edge (adjacent to the I-15 and which is proposed for residential use) is not precluded. Preliminary mapping indicates that there is potentially sufficient ROW to support Segment K between I-15 and 68th Street. However, any overlap between Segment K and the areas preliminarily identified for residential use by Riverbend may depend on final engineering and design of both projects.

Figure 5 – Least Bell's Vireo Critical Habitat



Chapter 6: COMPARISON OF SELECTED SEGMENT RE-ROUTE TO PROPOSED RTRP SEGMENT NEAR RIVERBEND

The project team reviewed the segment of the Riverbend segment as proposed in the RTRP EIR against the team's selected Segment Group 1 (Segment K). The team re-affirmed that despite the intervening approvals of Riverbend and the Vernola Apartment projects, the approximately 1.5 mile of RTRP's 230 kV transmission route that occupies portions of these developments remains the environmentally superior alternative under CEQA. None of the alternative segments considered in this analysis would have less environmental impacts than RTRP's currently proposed transmission segment in the Riverbend Area.

Segment K, more fully described in Section 3.8, could potentially enhance RTRP's compatibility with the Riverbend and Vernola Apartment developments. However, Segment K may result in increased environmental impacts, due to the proximity of the Santa Ana River to the southern edge of the golf course where the new poles would likely be constructed. These impacts may include, but are not limited to, biological, geological, and hydrologic impacts when compared with RTRP's proposed segment through the Riverbend and Vernola Apartment developments which are unoccupied and in very early stages of construction (SCE is informed that the Vernola Apartments project, while entitled, has not yet broken ground).

Despite any general increase in environmental impacts with Segment K, it is unknown whether Segment K would actually result in new significant environmental impacts and/or a substantial increase in the severity of a documented significant impact under CEQA at this time.

Appendix 1

Riverside Transmission Reliability Project Siting Study, August 31, 2006

POWER ENGINEERS, INC.
ENERGY, FACILITIES, COMMUNICATIONS

POWER ENGINEERS

731 E. BALL ROAD
SUITE 100
ANAHEIM, CA 92805-5951

PHONE 714-808-0123
FAX 714-808-0122

LETTER OF TRANSMITTAL

DATE: September 20, 2006

TO: Mr. Doug McEntee
Southern California Edison
1321 S. State College Blvd.
Fullerton, California 92813

SUBJECT: Riverside Transmission Reliability Project

Siting Study (Revised)

PROJECT NUMBER: 108539

THESE ARE TRANSMITTED: ☐ FOR YOUR INFORMATION ☒ FOR ACTION SPECIFIED BELOW ☐ FOR REVIEW AND COMMENT ☒ FOR YOUR USE ☐ AS REQUESTED

DOCUMENT DATE	COPIES	DESCRIPTION
9/20/06	1	RTRP Siting Study (Revised)

MESSAGE

Dear Mr. McEntee,

Enclosed are eight copies of the RTRP Siting Study. Some minor revisions have been made to this document; however, all maps and graphics are unchanged. This version replaces the original.

If you have any questions or comments, please contact me at (714) 507-2705.

Sincerely,

Allison Carver

Allison Carver
Environmental Specialist

AC
Enclosure(s)
Sent Via: UPS Second Day Air
Tracking Number: 1Z W28 V81 37 1000 187 6
cc: File

IF ENCLOSURES ARE NOT AS NOTED, PLEASE NOTIFY US AT ONCE.

ANA 009-063

August 31, 2006

CITY OF RIVERSIDE, CALIFORNIA (PUBLIC UTILITIES DEPARTMENT)

RIVERSIDE TRANSMISSION RELIABILITY PROJECT

SITING STUDY

PROJECT NUMBER:
109528

PROJECT CONTACT:
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POWER ENGINEERS

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EXECUTIVE SUMMARY

1 INTRODUCTION

Riverside Public Utilities (RPU) is a municipal utility that serves the City of Riverside, which is one of the fastest growing areas in Southern California. In order to meet increased electrical demand associated with this growth and the projected growth within the RPU service area, expansion in electrical generation capability and increased transmission capacity are required. In order to provide the additional capacity and to maintain system reliability, transmission line and substation improvements are necessary.

In November 2004, the RPU Board authorized RPU to enter an agreement with Southern California Edison (SCE) for completion of a System Impact Study and a Facilities Study. The results of these studies were received in June and October 2005, and indicate the need for construction of a double-circuited 230 kV transmission line into the City of Riverside, as well as a 230-69 kV substation (tentatively named Jurupa). The identified components (230 kV transmission line and substation are collectively called the Riverside Transmission Reliability Project (RTRP).

The System Impact Study identified the existing SCE Mira Loma-Vista 230 kV transmission line (Mira Loma-Vista #1) as the tap point for interconnecting the proposed Jurupa Substation to the existing SCE electrical grid. RPU has owned the proposed Jurupa Substation site since the 1970s for the purpose of eventually building a 230 kV substation. It is located near the northeast corner of Wilderness Avenue and Ed Perkic Street. The Project will also require construction of three 69 kV transmission lines within the city to transfer the bulk power into the RPU electrical system.

POWER Engineers, Inc. (POWER) was retained to complete the RTRP Feasibility Study. This Siting Study is a component of the Feasibility Study for the RTRP. The primary purposes of this Siting Study are to identify feasible alternative transmission line routes for the RTRP. These alternative routes will then be evaluated within the CEQA environmental review document that will be produced for evaluating potential environmental impacts from the proposed Project. The City of Riverside City Council will be the CEQA lead agency and decision making body for the Project.

This report presents the results of an inventory of baseline environmental conditions, sensitivity analyses for each environmental resource evaluated, and alternative route locations for the 230 kV transmission line. Figure E-1 presents a map of the Project Study Area.

2 PROJECT COMPONENTS AND ALTERNATIVES

The RTRP project components that were evaluated in this study include:

1. One double-circuit 230 kV transmission line from the proposed Jurupa substation to the existing SCE Mira Loma-Vista 230 kV line;
2. One double-circuit 69 kV transmission line from the proposed Jurupa Substation to Mt. View Substation
3. Two double-circuit 69 kV transmission lines from the proposed Jurupa Substation to a tap point on the RERC-Mt. View double-circuit 69 kV transmission line.

The siting study identified sensitive areas by utilizing a sensitivity analysis process that assigned sensitivity levels to environmental resources within the Project Study Area. Sensitivity levels were categorized into four levels: Exclusion, High Avoidance, Moderate Avoidance, and Low Avoidance. Environmental resources identified within the Study Area were then assigned a sensitivity level dependent upon the resources sensitivity to the construction, operation, and maintenance of the project components.

The data inventories were developed for each resource, consisting of land use, cultural resources, biological resources, water resources, and geohazards. Based upon this inventory and the sensitivity analyses, routing corridors were identified within the study area. These routing corridors represent wide areas that a transmission line could potentially be sited within. The corridors were established by avoiding the Exclusion areas, and avoiding the remaining sensitivity levels, to the greatest extent possible. Within the routing corridors, several alternative transmission line routes, or assumed centerlines, were identified that would meet the purpose and need of the RTRP. Aerial photography assisted in the identification of these alternative routes within the wide corridors. The corridors and alternative routes (assumed centerlines of the transmission lines) are shown on Figure E-1 and further described within Chapter 5 of this report. The alternative corridors and routes are also shown on Map 12, within Appendix A.

2.1 Field Review of 230 kV Alternatives

Following the identification of the alternative routes (Map 12, Appendix A), a field reconnaissance of each route was conducted. The field reconnaissance was focused on determining the feasibility of constructing each alternative transmission line route. RPU, SCE, and POWER representatives participated in the field review.

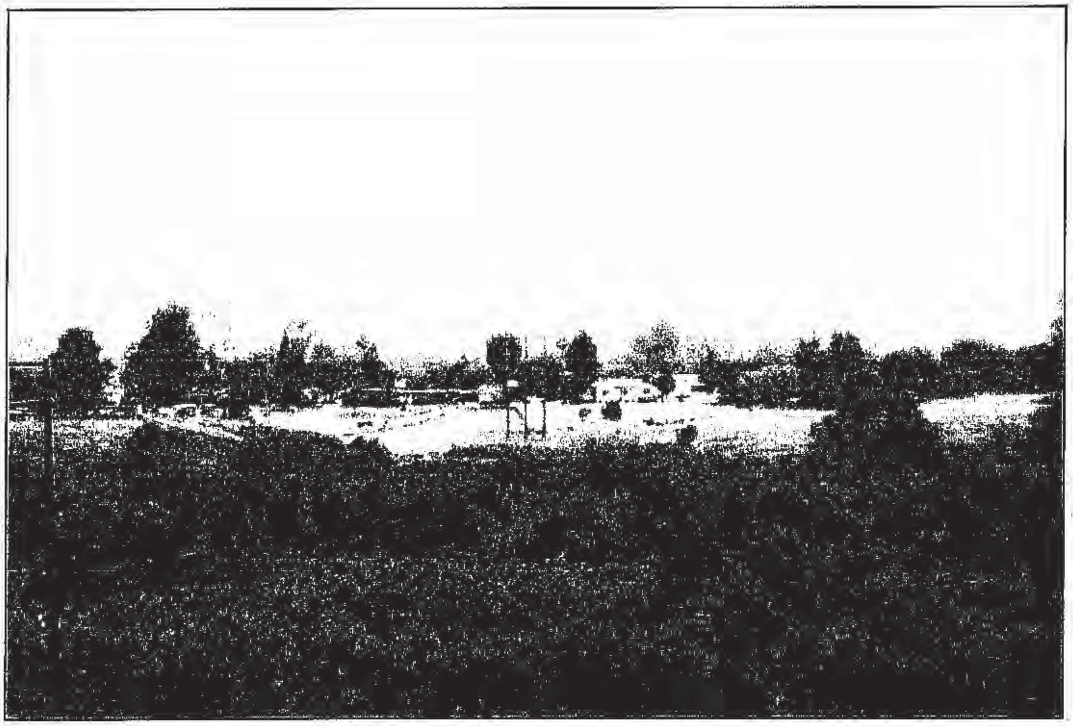
Several adjustments, removals, and additions were made to the alternative routes during the field investigation. Many of the changes included small adjustments of the originally identified routes. These were made in the field to better suit existing land uses, better placement of transmission structures, and to utilize existing access roads to the greatest extent. The major changes, primarily including removals and additions, are described below. The final alternative routes, reasonable for consideration for the proposed project, are displayed on Figure E-2.

Santa Ana River West Corridor

A change resulting from the review of the alternative routes within the Santa Ana River West Corridor (a description of this corridor is included in Chapter 5) involved the most westerly route, parallel Interstate 15. The open land, south of Limonite Ave. and east of Interstate 15, was observed as being graded for residential development. During the data collection task for this report, the area was identified within a specific plan and proposed residential. However, at that time the development had not begun. The current development would preclude the location of the proposed transmission line, and therefore the route was removed from consideration as not being a reasonable alternative.

Further changes included the relocation of the Santa Ana River crossing within the western corridor. The original crossing, located directly south of Bain Street, would be nearly a one-mile crossing and would be located adjacent to the Hidden Valley Nature Center, administered by the Riverside County Parks Department. The crossing was moved up-stream approximately one mile to a narrow crossing, and would be located parallel to an existing utility line (see Photo ES-1).

Photo ES-1: Proposed Santa Ana River crossing, east of Van Buren Blvd. and parallel to an existing electrical line.



Central Corridor

The Central Corridor alternatives were adjusted to better suit existing facilities and land uses within the corridors. These adjustments included the alternative that is located parallel to Van Buren Blvd., near Limonite Ave. Limonite Ave. is an underpass crossing of Van Buren Blvd. and the Union Pacific Railroad. The offramp from Van Buren Blvd. to Limonite Ave. is located within the spacing between Van Buren Blvd. and the railroad. Within this area, the alternative was re-routed to the east of the railroad, and then located back between Van Buren Blvd. and the railroad, on the north side of the Metrolink train station (see Photo ES-2). However, a new alternative was added along Etiwanda Ave., north of Galena Street. The new route would located on the east side of Etiwanda Ave. adjacent or within the Union Pacific Railroad Automobile Distribution Center.

Other changes included the removal of a small alternative adjacent to east side of Van Buren Blvd., immediately north of the Santa Ana River. This was removed because adequate spacing was not available due to existing land uses (commercial buildings).

Photo ES-2: Northern view along Union Pacific railroad and Van Buren Blvd. crossing over Limonite Ave.

Santa Ana River East Corridor

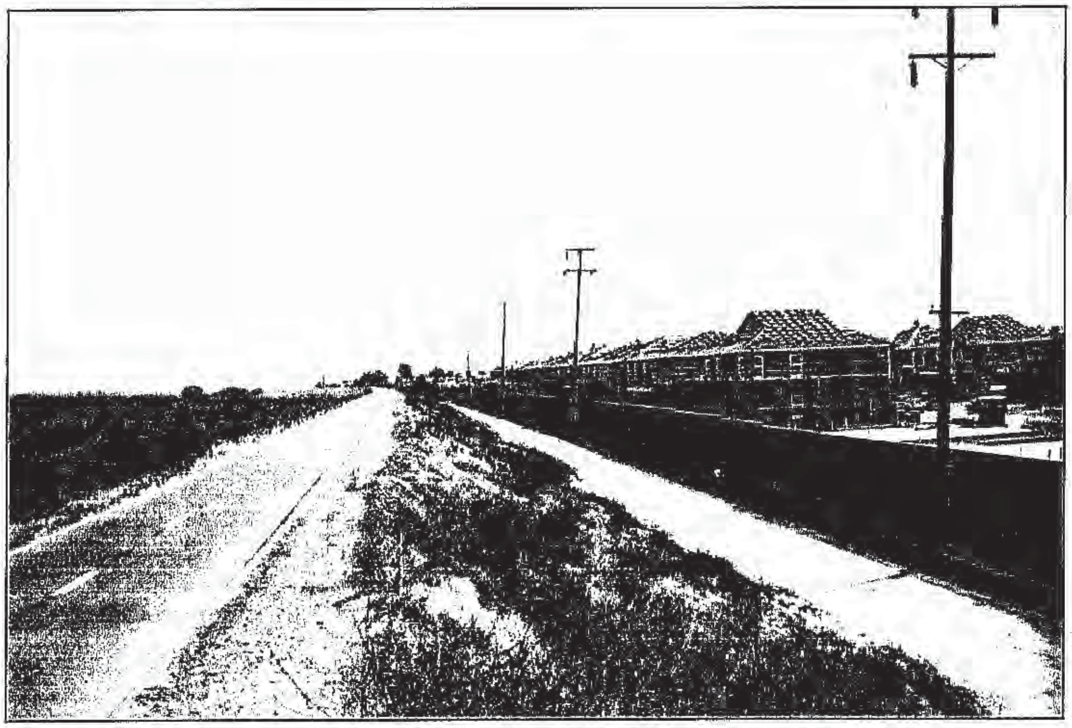
Approximately one and half miles east of the proposed Jurupa Substation site is a closed landfill. The alternative route crossing the landfill was removed from consideration due to engineering constraints on placement of transmission poles on unstable ground. The alternative was re-routed to the south side of the landfill. Adequate spacing on the north side of the landfill was not available.

One segment of the alternative routes along the south side of the Santa Ana River was removed between Market Street and Riverside Ave. (Main Street within Riverside County). The segment was removed due to existing and developing residential land uses adjacent to the Santa Ana River (see Photo ES-3). It was determined that adequate spacing for placement of the proposed double-circuit 230 kV transmission line was not available between the Santa Ana River levee and the residential properties (approximately 23 total feet between the base of the levee and the subdivision wall).

The removal of the segment described above led to the addition of an additional river crossing on the east side of Riverside Ave. An additional segment was added for consideration near the tap point on the Mira Loma-Vista #1 230 kV transmission line, east of the Santa Ana River. This segment was added for additional flexibility due to the presence of many existing transmission lines within the area, which may pose an engineering constraint to placement of the proposed transmission line.

The alternative route, adjacent to Riverside Ave. and north of Agua Mansa Road, was removed due to a lack of adequate spacing from existing land uses adjacent to the roadways.

Photo ES-3: Looking northeast along southern levee of the Santa Ana River; residential development adjacent to levee.



CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Riverside Public Utilities (RPU) is a municipally owned electric and water utility that serves the City of Riverside, California, which is located in the Inland Empire, one of the fastest growing areas in Southern California. In 2005, RPU, in association with Southern California Edison (SCE), conducted a System Impact Study and a Facilities Study that indicate the need for an electrical system upgrade in order to supply power to this rapidly increasing population.

1.2 PURPOSE AND NEED

The RTRP would provide a long-term solution to provide enough electrical capacity to meet RPU's current and projected load growth. Currently, all of RPU's energy for its customers comes through SCE's Vista Substation, located in the City of Grand Terrace. The capacity for RPU at the Vista Substation is limited to 557 MW. Based on current load growth, that limit could be exceeded as early as summer 2006.

The RTRP also would help to increase the reliability of RPU's electrical system. Because the Vista Substation is the only source of energy supply for RPU, any loss of supply at that substation would greatly affect RPU's ability to serve its customers. The proposed RTRP would provide a second point of delivery for electricity, reducing dependence on the existing Vista Substation and providing the capacity and reliability needed to support recent and future growth in the area. An additional substation also provides greater flexibility for future expansion of the electrical system, as needed.

1.3 RTRP PROJECT COMPONENTS

RTRP includes several system improvements, including a new double circuit 230 kV transmission line, new 230/69 kV substation, and new 69 kV overhead transmission lines.

The following is a listing of the RTRP project components that were evaluated in this study. More detailed descriptions of each project component evaluated are included in the subsequent chapters of this report.

1.3.1 230 kV Transmission Line

A new double-circuit 230 kV transmission line connecting the proposed Jurupa substation, located on RPU-owned land near the northeast corner of Wilderness Avenue and Ed Perkic Street, to the existing SCE Mira Loma-Vista #1 230 kV transmission line.

1.3.2 69kV Transmission Lines

As part of the RTRP, several 69 kV transmission lines would be constructed to connect the proposed Jurupa Substation to the existing RPU 69 kV electrical system. One double-circuit 69 kV transmission line would be built from the proposed Jurupa Substation to the Mt. View Substation.

Two double-circuit 69 kV transmission lines from the proposed Jurupa Substation would be built along Wilderness Avenue to a tap point on the RERC-Mt. View double-circuit 69 kV transmission line.

1.4 ROUTE STUDY OBJECTIVES

POWER Engineers, Inc. (POWER) was retained to complete the RTRP Siting Study. The primary objectives of this study are to:

- identify feasible alternative transmission line routes that would accommodate the proposed RTRP utilities;
- determine the feasibility of permitting alternative line routes;
- recommend alternative line routes and that should receive further study or action.

This report presents and summarizes the results of the environmental resource inventories and sensitivity analyses, alternatives identification process for transmission line alternatives, and recommendations for specific transmission line alternatives.

CHAPTER 2: STUDY METHODOLOGY

2.1 INTRODUCTION

2.2 STUDY AREA DELINEATION

The RTRP study area is located in the northwestern portion of Riverside County and the southwestern portion of San Bernardino County, and includes portions of the City of Riverside, the City of Norco, the City of Fontana, the City of Rialto, the City of Colton, City of Grand Terrace, and unincorporated areas of Riverside and San Bernardino Counties (Map 1). The study area measures approximately 41,720 acres (approximately 65 square miles) and was delineated to encompass all RTRP components and feasible transmission line alternatives. The northern boundary of the study area is logically defined by the location of the existing 230 kV transmission lines owned by SCE, including the project tap point, Mira Loma-Vista #1. The eastern boundary parallels existing 230 kV transmission lines then curves south, generally paralleling the urbanized area of the City of Riverside and the Santa Ana River corridor. The southern boundary parallels the Santa Ana River corridor and includes the RERC Substation and the proposed Jurupa Substation. The western boundary of the study area generally follows Interstate 15 and the existing residential development along the highway. The study area was utilized as the basis for data inventory and mapping and sensitivity analyses.

2.3 DATA INVENTORY AND MAPPING

Resource data for the study area were obtained from a variety of sources, including published and unpublished literature (e.g., documents, reports, studies, maps, etc.), correspondence and discussions with personnel from local, state and federal agencies, and aerial photographs. Inventory data were collected for six primary resource areas including land use resources, visual resources, biological resources, cultural resources, water resources, and geohazards. Resource data were then mapped utilizing a geographic information system (GIS), and ground reconnaissance was completed to verify and supplement inventory mapping. Once inventory mapping was completed, the maps were subsequently utilized for the purposes of conducting sensitivity analyses. The following provides information on inventory methodology by resource area.

2.3.1 Land Use

Land use inventory data were collected from a variety of sources for the study area. Land use inventory data for the study area were mapped utilizing GIS (Map 2). These data were organized into three general components:

- existing land use;
- planned land use; and
- parks, recreation, and preservation areas.

The existing land use component identifies surface structures, improvements, and land use designations that occur within the study area. The planned land use component identifies objectives, goals and/or policies regarding the locations of transmission lines, within the study area, per agency adopted or approved land use plans.

The parks, recreation, and preservation areas component identifies areas within the study area where the established or proposed land use is primarily for recreational enjoyment or to protect and preserve a valuable environmental resource.

2.3.2 Visual Resources

The visual resource inventory included identification of important visually sensitive points, corridors, and areas. These receptors include residential land uses, parks and recreation areas, important trails and travel corridors, and agency management plans and special designations. These were identified through literature review, correspondence and discussions with governmental agencies, GIS data collected from agencies, and field investigations. Land management plans and land use regulations were also reviewed to determine statutory requirements or policy guidelines relating to visual resources within the study area.

2.3.3 Cultural Resources

Cultural resources are districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious or other reasons. For this sensitivity analysis, cultural resources have been divided into three major categories: archaeological resources, architectural resources, and traditional cultural properties (TCPs). Archaeological resources are locations where human activity has measurably altered the earth or left deposits of physical remains (e.g., stone tools, cans, bottles, milling stations, petroglyphs, pictographs, house foundations, cemeteries). Architectural resources include standing buildings (e.g., houses, schools, churches) and intact structures (e.g., canals, bridges). Traditional cultural properties (TCPs) are resources that are important to a community's traditional practices and beliefs and for maintaining the community's cultural identity (Parker and King 1998).

Several laws and regulations require that information about cultural resources be kept confidential to protect them from vandalism. For this reason, this section offers only limited descriptions of the characteristics and locations of cultural resources in the project area. In addition, no information on TCPs will be shared without permission from those providing the information.

TRC Solutions, Inc., a subcontractor to POWER Engineers, Inc., conducted a records search for the area within the project boundaries to identify portions of the project area with potentially sensitive cultural resources. TRC consulted historic and archaeological records at the Archaeological Information Centers at the University of California, Riverside and the San Bernardino County Museum. Each is part of the California Historical Resources Information System (CHRIS) of the Office of Historic Preservation (OHP). The project boundaries include portions of the U.S. Geological Survey (USGS) Corona North, Guasti, Fontana, Riverside East, Riverside West, and San Bernardino South 7.5-minute quadrangles. TRC reviewed those maps at the information centers to determine the locations of previous cultural resource technical studies and of cultural resources recorded during those studies. Specific data regarding previously recorded cultural resources were tabulated, including each resource's OHP trinomial designation; UTM coordinates; township, range, and section number; site type, site size, and its current status, as indicated on the most recent site record, regarding eligibility for inclusion in the National Register of Historic Places. Cultural resource data was mapped using GIS (Map 4).

Additionally, all manuscript numbers for technical studies conducted within the project boundaries were listed, however, well over a hundred studies were identified and a review of each study was outside the scope of this sensitivity analysis.

TRC also reviewed the National Register Information System (NRIS) of the National Register of Historic Places, the California Register of Historic Resources, and the list of California Historical Landmarks provided by the OHP.

TRC has requested that the California Native American Heritage Commission (NAHC) review its records for the presence of any Native American sacred lands or traditional cultural properties within the project boundary.

No field survey was performed to verify or supplement the information obtained from these data sources

2.3.4 Biological Resources

Existing information on biological resources was obtained from a variety of sources, including existing reports, the California Natural Diversity Database (CNDDB), and the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Biological resource inventory data for the study area were mapped utilizing GIS (Map 5).

2.3.5 Water Resources and Wetlands

Information on water resources within the study area were obtained from a variety of sources. Water resources evaluated include riparian vegetation, floodplains, rivers, ponds, lakes/reservoirs, and ditches/canals/channels. Water resource inventory utilized GIS data obtained from Riverside County, the Federal Emergency Management Agency, and the Riverside County Regional Flood Control and Water Conservation District. National Wetlands Inventory (NWI) mapping was not available for the study area. A water resource inventory map was prepared utilizing GIS (Map 7).

2.3.6 Geohazards

For the purposes of this study, geohazards considered within the study area included active faulting, liquefaction, and steep slopes. Information on geological hazards within the study area was obtained from the County of Riverside and the City of Riverside and mapped on the Geohazards Map (Map 8). Slopes were mapped into four categories of percent slope: 0 – 15%, 15 – 30%, 30 – 45%, and above 45%.

2.4 SENSITIVITY CRITERIA

Sensitivity is defined as a measure of probable adverse response of a resource to direct and indirect impacts associated with the construction, operation, and maintenance of project components. The determination of sensitivity included consideration of the following:

- **Resource Value:** A measure of rarity, intrinsic worth, singularity, or diversity of a resource within the area;
- **Protective Status:** A measure of the formal concern as expressed by legal protection or special status designation;
- **Present and Future Uses:** A measure of the level of potential conflict with land management and land use policies; and
- **Hazards:** A measure of the degree to which construction and/or operation of the proposed project represents a significant hazard to a resource.

Using this framework, the mapped inventory data will be analyzed and assigned relative sensitivity values. Sensitivity maps were developed for **land use, cultural, biological, and water resources, and geohazards**. Sensitivity levels were categorized as exclusion, high, moderate, or low based upon the following general characteristics:

<u>Exclusion</u>: Areas where the siting of transmission lines is essentially precluded. This category includes: (1) areas which contain polices for legally protected resources (e.g. wilderness area, national park); (2) where government regulation expressly prohibits encroachment; (3) where ownership and use of the land preempts the siting of a transmission line, and (4) areas where there would be unacceptable hazards to the construction or operation of a transmission line.

<u>High Avoidance</u>: Areas are determined to have high sensitivity due to: (1) the presence of unique, highly valued, or legally protected cultural, biological, or water resources; (2) a large potential for conflict with existing or planned land uses; and (3) substantial hazards to construction and operation of a transmission line or substation. Areas designated as high sensitivity also include those portions of the study area with a combination of resources that result in a high potential for impacts. For the purposes of this study, areas designated as high sensitivity are considered to be least desirable and should be avoided, if possible.

<u>Moderate Avoidance</u>: Areas are determined to have moderate sensitivity due to: (1) the presence of cultural, biological, or water resources that are valued and/or assigned special status; (2) a moderate potential for conflict with existing or planned land uses; and (3) limited hazards to construction and operation of a transmission line or substation. For the purposes of this study, areas designated as moderate sensitivity are not considered to be highly desirable, but may be used with careful consideration of design, layout, and the minimization of adverse impacts.

<u>Low Avoidance or Opportunities</u>: Areas are determined to have low sensitivity where: (1) there are no cultural resources, no valued or special status biological, or water resources; (2) minimal conflict with existing or planned land uses; and (3) no hazards exist to construction and operation of a transmission line or substation. For the purposes of this study, areas designated as low sensitivity are most desirable for the siting of project components.

2.4.1 Land Use

Land use sensitivity levels were largely based upon the potential for conflict with existing or planned land uses within the study area. Examples of relatively sensitive land uses that were designated as Exclusion include schools and residential areas. A High Avoidance level was assigned to areas that contain proposed or planned residential development, and a Moderate Avoidance was assigned to areas such as commercial and industrial areas. Low Avoidance areas were those areas that had no valued or protected resources such as existing utility or transportation corridors.

2.4.2 Visual Resources

For the purposes of this study, parks, recreation and preservation areas, residential areas, mapped regional recreational and historic trails, and existing or proposed designated scenic corridor or parkways were buffered ½ mile for expected foreground viewing condition for high expected visibility.

The focus of the visual resources inventory was on existing land uses and local laws, ordinances and regulations. Important visual receptors were identified based on potential high impacts and visual sensitivity.

Visual sensitivity for this study is a function of:

- Land Use Patterns: urban areas that have a mix of divergent and incoherent land uses and visual quality (commercial and industrial areas with a wide variety of signage, lights and billboards) are likely to be less sensitive than established residential neighborhoods where people are much more likely to have a stake in the quality of the landscape;

- Agency visual resource management guidelines and jurisdictional plans: land management agencies often have established plans, laws, and regulations as to how the visual environment will be managed;

- View duration: long view durations typically tend to increase sensitivity levels;

- User attitudes towards change: areas where the public has low expectations for maintaining scenic integrity generally occur in commercial or industrial areas where human-caused modifications already exist in the landscape; conversely, high expectations for maintaining scenic quality are likely to occur where a critical part of most people's visual experience is the quality of the environment, such as in residential and recreation areas;

- Use volume: high levels of use, such as more visits to a park or higher traffic volume on a road, would be expected to cause a greater overall effect on sensitivity levels; and

- Distance: the proximity of seen areas or elements will influence sensitivity levels; the closer visual contrasts are to a viewer, the more likely the viewer could be affected.

Based on previous studies of similar transmission lines, the highest impacts on high sensitivity viewers for a 230 kV line in a similar environmental setting would be expected to potentially cause the greatest impacts within 1/2 –mile.

2.4.3 Cultural Resources

A general sensitivity rating was assigned for specific portions of the project area to distinguish areas of high and low cultural resource sensitivity. Criteria for selecting areas of high sensitivity are:

- The presence of known archaeological or historical site distributions

- Geographical features, such as the Jurupa Mountains and the Santa Ana River drainage, that are known to contain numerous cultural resources; and

- Large parcels of unsurveyed and undeveloped land for which there is no information available on cultural resources and which appear to be relatively undisturbed.

Criteria for identifying areas low in cultural resource sensitivity are:

- Previously surveyed parcels that do not contain any recorded cultural resources;

- Highly developed areas of relatively recent construction that area unlikely to contain intact or undisturbed archaeological or historical components.

2.4.4 Biological Resources

Biological sensitivity levels were based upon the presence or absence of threatened, endangered, or sensitive (TES) plant and animal species as well as habitats that support these species. Areas designated as High Avoidance include habitats that are known to support TES species and habitats that are of appropriate size, configuration, and vegetation characteristics to generally support the life history requirements of one or more species covered under the MSHCP. Native vegetation communities, such as Riversidian Sage, support special status plant and wildlife species, and were designated as High Avoidance. Areas designated as Low Avoidance or Opportunities are disturbed non-native grasslands, field croplands, and developed residential and industrial areas.

2.4.5 Water Resources and Wetlands

Sensitivity criteria were developed to reflect the sensitivity of water resources relative to the identification of transmission line corridors. Sensitivity levels for water resources were largely based upon their hydrological capacity, potential to affect engineering and design, and accessory benefits (e.g., plant and wildlife habitat). Regulations affecting water resources will become more pertinent at the design level where state and local regulations regarding stream and river buffers will be taken into consideration. The primary objective during the corridor selection phase was to minimize the number of stream, river, and lake crossings. Generally, man-made structures, such as ditches, canals and channels, were considered to have low sensitivity and were designated Low Avoidance, while floodplains, rivers, wetlands, and lakes/reservoirs were categorized as moderate sensitivity and Moderate Avoidance.

2.4.6 Geohazards

Sensitivity criteria were developed to reflect the sensitivity of geohazards relative to the identification of transmission line corridors. Sensitivity levels were largely based upon the degree to which soils within the study area are prone to the presence or absence of faults within the study area, liquefaction in the event of seismic activity, and the presence of steep slopes that have the potential to place constraints on the siting of transmission lines. The primary objective during the corridor selection phase was to identify areas where geological hazards would constrain or prevent the routing of transmission lines.

CHAPTER 3: INVENTORY RESULTS

3.1 INTRODUCTION

This chapter presents the results of the environmental inventories that were conducted for the study. These inventory results were used as the basis for subsequent sensitivity analyses and the identification of opportunities and constraints areas for the project components. The following presents a description of inventories by individual resource area, and includes:

- **Land use resources** – land jurisdiction, existing land use, existing zoning, planned land use, and parks, recreation, and preservation areas;
- **Visual resources** – landscape character, sensitive viewers, and jurisdictional plans;
- **Biological resources** – threatened and endangered species, critical habitat, and unique or sensitive habitats;
- **Cultural resources** – historical and archaeological characteristics;
- **Water resources** – flood control basins and channels, floodplains, wetlands, and lakes/reservoirs; and
- **Geohazards** – earthquake faults, liquefaction susceptibility, and steepness of slopes.

3.1.1 Land Use Resources

3.1.1.1 Environmental Setting

The study area encompasses unincorporated portions of northwestern Riverside County, southwestern San Bernardino County and 6 incorporated cities (Riverside, Norco, Fontana, Rialto, Colton, and Grand Terrace). Unincorporated communities include Rubidoux, Sunnyslope, Belltown, Glen Avon, Indian Hills, Pedley, Mira Loma, Bloomington, and Highgrove. Rapid population growth in the study area has resulted in a rapid increase in development, with accompanying changes in land use. The natural topography can be described as a valley lowland area intersected with rolling hills surrounded by mountainous ranges.

The Santa Ana River, located in the south and southeast of the study area, represents a recreational, habitat, and visual resource. Throughout the area, interconnecting trails provide access to a scenic wildlife setting. The Hidden Valley Wildlife Area serves as a nature center that includes hiking and equestrian activities.

3.1.1.2 Existing Land Use

The existing land uses analyzed in this section include both natural and human-modified developments. The majority of the study area is characterized by rural, urban and suburban development intermixed with agricultural operations and undeveloped lands. Existing land uses within the study area include developed, agriculture, and open space/vacant land categories. Developed land uses include residential uses (single-family detached, single-family attached, high-density residential, and mobile homes), commercial uses (retail/office and tourist/commercial recreation), industrial uses (light industrial/business park, heavy industrial, mineral extraction, and warehouse), public facilities (utilities, other public facilities, and schools), air facilities, linear facilities (roadways, railroads, bikeways, trails, flood control channels, major utility corridors), recreational uses (recreation open space), and rural uses (rural residential). Agricultural land in the study area includes row crops, groves, nurseries, dairies, poultry farms, processing plants, and other related uses. Open space/vacant lands are composed of natural, vacant, and water categories.

Schools, air facilities, linear features, drainage systems, and solid waste facilities are discussed further below. Map 2 is a land use inventory map for the study.

Schools

As shown in Map 2 there are 38 existing and 6 planned public or private schools located within the study area (see Table 3-1).

Table 3-1 Existing and Planned Public or Private Schools within the Study Area

Existing School Name	School District
Fremont Elementary School	Riverside Unified School District
Bryant Elementary School	Riverside Unified School District
Southridge Middle School	Fontana Unified School District
Canyon Creek Elementary School	Fontana Unified School District
Oak Park Elementary School	Fontana Unified School District
Jurupa Vista Elementary School	Colton Joint Unified School District
D'Arcy Elementary School	Colton Joint Unified School District
Ruth O. Harris Middle School	Colton Joint Unified School District
Riverview Elementary School	Corona-Norco Unified School District
Jurupa Valley High School	Jurupa Unified School District
Mission Bell Elementary School	Jurupa Unified School District
Granite Hill Elementary School	Jurupa Unified School District
Sunnyslope Elementary School	Jurupa Unified School District
Nueva Vista Continuation High School	Jurupa Unified School District
Mission Middle School (closed during 2005-2006)	Jurupa Unified School District
Mission Middle School (Interim Campus)	Jurupa Unified School District
Ina Arbuckle Elementary School	Jurupa Unified School District
Mira Loma Middle School	Jurupa Unified School District
Van Buren Elementary School	Jurupa Unified School District
Jurupa Middle School	Jurupa Unified School District
Glen Avon Elementary School	Jurupa Unified School District
Rubidoux High School	Jurupa Unified School District
Stone Avenue Elementary School	Jurupa Unified School District
Camino Real Elementary School	Jurupa Unified School District
Rustic Lane Elementary School :	Jurupa Unified School District
West Riverside Elementary School	Jurupa Unified School District
Pacific Avenue Elementary School	Jurupa Unified School District
Peralta Elementary School	Jurupa Unified School District
Indian Hills Elementary School	Jurupa Unified School District
Pedley Elementary School	Jurupa Unified School District
Troth Street Elementary School	Jurupa Unified School District
Sky Country Elementary School	Jurupa Unified School District
Terrace Elementary School	Alvord Unified School District
Norte Vista High School	Alvord Unified School District
Existing School Name	**School District**
Son Shine Christian Elementary School	Private
Glen Avon Christian Elementary School	Private
La Petite Elementary School	Private
Our Lady of Perpetual Help Elementary School	Private

Planned School Name	School District
Patricia Beatty Elementary School	Riverside Unified School District
Louis VanderMolen Fundamental Elementary School	Corona-Norco Unified School District
K-8 School	Jurupa Unified School District
Pedley Elementary School Future expansion 7-8 grades	Jurupa Unified School District
K-8 School (within Rio Vista Specific Plan 243)	Jurupa Unified School District
K-8 School (within Emerald Springs Ranch Specific Plan 337)	Jurupa Unified School District

Air Facilities

Two airports, Riverside Municipal Airport and Flabob, are located within or in the immediate vicinity of the study area. Owned and operated by the City of Riverside, Riverside Municipal Airport is situated inside the western portion of the city limits. The airport occupies some 441 acres with its operations overseen by the City of Riverside Airport Commission. It has two intersecting runways; the primary runway running roughly east/west, and a shorter crosswind runway, aligned north/south. A precision instrument approach procedure is established from the west, although most of the aircraft operations are in the opposite direction. An air traffic control tower serves the airport. From a land use compatibility standpoint, the most significant improvement planned for the airport is a 750-foot easterly extension of the runway. Establishment of a non-precision instrument approach procedure from the east also is planned.

Flabob Airport, a private airport, is situated along the edge of the Santa Ana River just west of downtown Riverside. The present airport has existed since at least 1925. The airport was acquired by the Thomas W. Walthen Foundation in 2000. The new owners have removed some of the old buildings, constructed several new hangars, and repaved much of the airfield. Today, the airport is home to some 200 aircraft, many of them vintage or experimental airplanes. Providing educational programs for local schoolchildren is another role played by the airport. Facility improvement plans include a school (aviation-based public charter high school), a museum and educational center, a 12.5-acre business park with space for 10 to 29 aviation-based businesses, and 85 new hangars for individual airplane owners. The hangars would be constructed in conjunction with a 85-home housing tract (Masterpiece Skyport at Flabob Airport) to be built next to Flabob by a private developer. A corresponding increase in aircraft operations can be anticipated. However, the limited land area prevents expansion of the single 3,190-foot runway (a shorter turf runway was closed in the early 1980s).

Linear Features

The existing circulation and transportation system serving the study area and immediate vicinity is composed of a series of separate modes or types of passenger travel and goods movement. These modes of travel and goods movement include passenger vehicles and truck freight, transit, passenger and freight rail, non-motorized systems (bicycle facilities, pedestrian facilities, and equestrian facilities). The study area also contains major utility corridors.

The transportation system is composed of state highways (both freeways and arterial highways), as well as county and city roadways. The street and highway system provides a rather dense definition of roads of countywide significance. The highway network is composed of three interstate routes (I-10, I-15, and I-215), and two state routes (SR-60 and SR-91). In addition, the highway system includes numerous county roadways, as well as roadways within each of the six cities in the study area. Some of the major roadways include Agua Mansa Road, Armstrong Road, Jurupa Road, Limonite Avenue, Market Street, Mission

Boulevard, Pedley Road, Riverside Avenue, Rubidoux Boulevard, Van Buren Boulevard, and Washington Street. Proposed improvements to Riverside Avenue would realign the roadway generally across or around the closed Riverside County landfill, circumventing the Spring Mountain Ranch development on the north, connecting to Main Street in the community of Highgrove in unincorporated Riverside County, proceed westerly across I-215 to Riverside Avenue, and follow Riverside Avenue north to I-10. In addition, La Cadena Drive would be realigned to allow an elevated intersection with the Pigeon Pass-Riverside Avenue arterial west of I-215. The realigned portion of La Cadena would match the existing La Cadena roadway.

The public transit system includes fixed route public transit systems (Riverside Transit Agency), common bus carriers, MetroLink (commuter rail service), and other local agency transit and paratransit services. In addition, the transportation system in the study area includes freight rail service (Union Pacific Railroad), bicycle facilities, and other non-motorized forms of transportation (pedestrian and equestrian trails).

Major conveyance lines for water, natural gas, and electricity transmission systems form a substantial network of corridors crossing the study area. Major utility transmission lines are shown on Map 1. There is a concentration of major electrical transmission lines running west to east, approximately 2 miles south of I-10.

Drainage Systems

The Riverside County Flood Control and Water Conservation District (RCFCWCD) is responsible for the operation and maintenance of regional flood control facilities such as dams, flood basins, levees, open channels and regional underground storm drains. In most cases, RCFCWCD does not maintain storm drain inlets or pipes less than 36 inches in diameter. The RCFCWCD is also responsible for construction of new facilities called for in its adopted Master Drainage Plan. Smaller drainage facilities, consisting mostly of underground closed conduits and storm drains located primarily in developed areas, are typically maintained by City or County Transportation Department crews. These local facilities collect stormwater and convey it to regional facilities, including the Santa Ana River and arroyos located in the study area. The United States Army Corps of Engineers has the primary planning responsibility for the Santa Ana River. The facilities constructed pursuant to Corps of Engineer master plans are operated by the RCFCWCD.

Solid Waste Facilities

The Colton Sanitary Landfill is located in the study area. This active landfill is located approximately one mile west of the Vista Substation. Plans for the landfill include either closure or expansion.

3.1.1.3 Planned Land Use

The study area contains land under the jurisdiction of the County of Riverside, County of San Bernardino, and the cities of Riverside, Norco, Fontana, Rialto, Colton, and Grand Terrace.

Planned land uses are defined by long-range planning documents, such as general plans, community plans, specific plans, and zoning ordinances, which guide future development and growth patterns within a given jurisdictional planning area. State law requires all counties and cities in the State to prepare and maintain a general plan for the long-term growth, development, and management of the community. The general plan acts as a charter for development, and is a city's or county's lead legal document in relation to growth, development, and resource management issues. Specific Plans are usually highly detailed and often include special development and land use standards which supersede both the General Plan and the Zoning Ordinance. Other plans include habitat or wildlife conservation plans. The following section presents a general description of plans and policies, applicable to the study area. These planning documents, as they relate to utilities, are described below.

County of Riverside

General Plan

Unincorporated lands in Riverside County, not within a specific plan or a Community Plan, are covered by the Riverside County General Plan (2003) as administered by the Riverside County Transportation and Land Management Agency.

The General Plan provides policy direction at two levels: 1) Countywide for the entire unincorporated portion of the County under Board of Supervisors' Authority; and 2) for 19 sectors of the County in the form of Area Plans. The intent of this tiered system of policy direction is to distinguish between policies that apply uniformly everywhere in unincorporated territory and those that apply explicitly in distinct geographic areas. Area Plans provide more detailed policy direction.

The countywide policy direction is captured in traditional topical elements as depicted in the California Government Code: Land Use, Circulation, Multipurpose Open Space (Open Space and Conservation as specified in the law), Safety, Noise and Housing. An additional optional element, Air Quality, also operates at the countywide level. Policies at this level apply to all Area Plans in addition to the localized policies contained in them, but do not have to be duplicated in the area plan documents.

<u>Countywide Policies</u>

LU 5.4 Ensure that development and conservation land uses do not infringe upon existing public utility corridors, including fee owned rights-of- way and permanent easements, whose true land use is that of "public facilities". This policy will ensure that the "public facilities" designation governs over what otherwise may be inferred by the large scale general plan maps.

LU 13.5 Require new or relocated electric or communication distribution lines, which would be visible from Designated and Eligible State and County Scenic Highways, to be placed underground.

LU 14.2 Review all proposed projects and require consistency with any applicable airport land use compatibility plan as set forth in Appendix L of the General Plan and as summarized in the Area Plan's Airport Influence Area section for the airport in question.

LU 14.7 Ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

LU 14.9 All development proposals within an Airport Influence Area will be submitted to the affected airport.

LU 25.5 Require that public facilities be designed to consider their surroundings and visually enhance, not degrade the character of the surrounding area.

LU 25.6 Ensure that development and conservation land uses do not infringe upon existing public utility corridors, including fee owned rights-of-way and permanent easements, whose true land use is that of Public Facilities. This policy will ensure that the "public facilities" designation governs over what otherwise may be inferred by the large-scale general plan maps.

OS 20.2 Prevent unnecessary extension of public facilities, services, and utilities, for urban uses, into Open Space-Conservation designated areas.

OS 20.3 Discourage the absorption of dedicated park lands by non-recreational uses, public or private. Where absorption is unavoidable, replace park lands that are absorbed by other uses with similar or improved facilities and programs.

Area Plan Policies

Eastvale Area Plan-Santa Ana River Corridor Policy Area

EAP 1.13 Discourage utility lines within the river corridor. If approved, lines shall be placed underground where feasible and shall be located in a manner to harmonize with the natural environment and amenity of the river.

Jurupa Area Plan-Santa Ana River Corridor Policy Area

JURAP 7.13 Discourage utility lines within the river corridor. If approved, lines shall be placed underground where feasible and shall be located in a manner to harmonize with the natural environment and amenity of the river.

Jurupa Area Plan-Flabob Airport Influence Policy Area

JURAP 8.2 There are three safety zones associated with the Flabob Airport Influence Area. Properties within these zones are subject to regulations governing such issues as development intensity, density, height of structures, and noise.

Riverside Municipal Airport and Flabob Airport Influence Policy Area.

Properties within these zones are subject to regulations governing such issues as development intensity, density, height of structures, and noise. Within Flabob Airport imaginary approach surfaces and Areas of Additional Safety Concerns, residential lot sizes smaller than two and one-half acres are not allowed. These land use restrictions are fully set forth in Appendix L of the General Plan and are summarized in Table 4, Land Use Compatibility Guidelines for Airport Safety Zones for March, Flabob, Bermuda Dunes, Chino, and Skylark Airports, and land use proposals shall be evaluated for appropriateness within these safety zones. For more information on these zones and additional airport policies, refer to Appendix L and the Land Use, Circulation, Safety and Noise Elements of the Riverside County General Plan.

JURAP 8.3 To provide for the orderly development of Flabob Airport and the surrounding area, comply with the Airport Land Use Compatibility Plan for Flabob Airport as fully set forth in Appendix L of the General Plan and as summarized in Table 4 therein, as well as any applicable policies related to airports in the Land Use, Circulation, Safety and Noise Elements of the Riverside County General Plan.

Jurupa Area Plan-Riverside Municipal Airport Influence Policy Area

JURAP 9.1 To provide for the orderly development of Riverside Municipal Airport and the surrounding area, comply with the Airport Land Use Compatibility Plan for Riverside Municipal

Airport as fully set forth in Appendix L of the General Plan and as summarized in Table 5, as well as any applicable policies related to airports in the Land Use, Circulation, Safety and Noise Elements of the Riverside County General Plan.

Specific Plans

The following specific plans were identified in the study area:

- Mission De Anza Specific Plan 123
- Sky Country Specific Plan 125
- Agua Mansa Industrial Corridor Specific Plan 210
- Rio Vista Specific Plan 243
- Interstate 15 Specific Plan 266
- Emerald Meadows Ranch Specific Plan 337

County of San Bernardino

General Plan

The General Plan is a policy document that guides all aspects of land use within the County. The current San Bernardino County General Plan is the product of a comprehensive update completed in June of 1989 that was a major overhaul of the previous General Plan. The 1989 General Plan established land use policies for a 20-year planning horizon.

The San Bernardino County General Plan was adopted in 1989 and revised in 1999. The General Plan has been amended by the adoption of a resolution by the Board of Supervisors on December 21, 2000, November 22, 2001, September 10, 2002, and March 27, 2003. The following policies and actions are provided.

Countywide Plans

OR-1 Because preservation of open space lands will be facilitated through the application of land use standards, the County shall implement the following actions:

> c. Utilize the Hazard and Resources Overlay Maps to identify areas suitable or required for retention as open space. Resources and issues identified on the Overlays which indicate open space as an appropriate use may include: flood, fire, geologic, aviation, noise, cultural, prime soils, biological, scenic resources, minerals, agricultural preserves, utility corridors, water supply and water recharge.
>
> e. Ensure that any portion of the planning area that is under public and quasi-public domain but not necessary for public or quasi-public use be considered first for open space, and then for uses requiring development of the site.

OR-51 Because the provision of scenic areas, trails and scenic highways is an integral part of the planning process, the County shall require the following:

> h. Encourage undergrounding of all utility facilities for all projects requiring discretionary or ministerial action.

ET-3 Because the efficient production, distribution and routing of energy and telecommunications will maximize resources, the County shall:

> a. Actively participate in the formation of regional siting plans and policies, such as:
>
> i) Memorandum of Understanding with other affected agencies
> ii) The Joint Utilities Management Program

b. Consolidate pipeline and transmission line corridors by requiring proposed new facilities to locate in existing corridors to the maximum extent feasible. When new transmission facilities cannot be located within existing corridors, assist in investigating the feasibility of establishing corridors parallel to interstate freeways.

ET-6 Because the use of new and innovative resources, technologies and design features in energy and telecommunications facilities can assist in maximizing resources and minimizing impacts, the County shall:

b. Require undergrounding of new and existing transmission lines when feasible.

e. Resist any proposed powerline routes for major steel tower electrical transmission lines along existing wooden pole lines.

ET-7 Because land uses adjacent to utility corridors must be compatible, the County shall approve only those secondary uses within corridors that are compatible with adjacent land uses.

Specific Plans

The following specific plans were identified in the study area:

- Agua Mansa Industrial Corridor Specific Plan
- Kaiser Commerce Center

Recognizing a need to update the 1989 General Plan, the Board of Supervisors has approved a General Plan Update (GPU) process that consists of two phases, the first of which was completed in 2002. During Phase I of the GPU, a strategic analysis of the 1989 General Plan and Environmental Impact Report (EIR) was conducted. The actual General Plan Update, Phase II, currently undergoing.

City of Riverside

General Plan

The Riverside General Plan 2010, adopted in 1994, currently serves as the principal policy document guiding the growth and development of Riverside.

The Growth Management section contains five of the elements required by state law. Relevant Airport Goals and Policies, identified in the Transportation Element, are listed below:

Goal T 3 To support and expand airport services for the Riverside community.

Policy T 3.5 The City should protect flight paths from inappropriate development encroachment.

Policy T 3.7 The City should place a high priority on air safety through careful planning and management of the airport system.

Policy T 3.8 The City should limit building heights and land use intensities beneath airport approach and departure paths to protect public safety.

Area Plans

The General Plan includes two categories of area plans: community plans and specific plans. The total planning area is divided into 25 subareas or "communities". Many of these encompass areas historically recognized as distinct communities or neighborhoods and which have been the subject of past planning studies. Generally, plans which have been previously adopted for various subareas are more detailed but are nevertheless consistent with the General Plan. Several subareas have currently adopted community plans which have been developed in past years. Pre-existing community plans have been superseded by the community plan text of the Riverside General Plan 2010. Community plans contained in the General Plan and within the study area are:

- Northside (adopted 1991)

The Plan area for the Northside Community includes approximately 1,904 acres generally bounded by I-215 Freeway on the east, U.S. 60 on the south, the Santa Ana River on the west, and San Bernardino County and the City of Colton to the north.

The Northside Community Plan focuses on guidelines to achieve a balanced community with single family residential neighborhoods, recreation and open space areas, specific areas for office and industrial development and commercial uses. Presented below are relevant goals and policies included within the Northside Community Plan.

Goal N-1 To establish the Northside Community as a balanced community in which it is pleasant to live, work and recreate.

Policy N-1.6 The Orange Street frontage of Reid Park should be modified by replacing the overhead utilities with underground utilities.

Policy N-2.3 Center Street shall be extended to Main Street generally along the Riverside County's 1970 adopted specific plan right-of-way except that the portion at the intersection of Center Street and Orange Street should be modified so that any construction or right-of-way acquisition is outside the Trujillo Adobe property. The grant funding for the adobe's purchase apparently precludes any encroachment on the property. Developments on or adjacent to the proposed alignment should dedicate the right-of-way and construct portions of the street per standard City development practices. In order to create a new visual image for this part of the Community Plan area, the street from the I-215 Freeway to Main Street should be constructed with a tree planted landscape median and with all utilities placed underground.

Policy N-2.14 The long term goal for land use within the Northside Specific Plan is to move all utilities underground. Funding should come from City and County budget allocations, possible assessment districts and CALTRANS. Given the high cost and likely long time span for implementation, priorities for moving utilities should be as shown below:

Table 3-2 Utility Undergrounding Priorities, by Street

Priority	Street
1	Columbia Avenue (Main to Orange Street)
2	Orange Street (Columbia Avenue to Burt Drive)
3	Columbia Avenue (Orange Street to W. La Cadena)
4	Orange Street (Columbia Avenue to U.S. 60 Freeway) (Burt Drive to Placentia Lane)
5	Other Streets
*	West La Cadena
**	Center Street

* West La Cadena Drive should be considered a special case since the overhead utilities detract from the Scenic Highway designation of this street. Undergrounding should be incorporated as part of any widening of the I-215 Freeway and funded as part of the Freeway project.
** Portions of existing Center Street and Placentia Lane that will be part of the new Center Street having existing 12 KV lines. These lines should be undergrounded as part of the Center Street extension.

Policy N-2.16 The U.S. 60 Freeway and Interstate 215 shall be considered to be designated as City of Riverside Scenic Highways with the following aesthetic measures:

Overhead utility lines on West La Cadena Drive should be placed underground.

Several subareas contain adopted or pending specific plans. Most of the adopted specific plans coincide with subareas of the same name as noted above. A few, however, are portions of larger subareas or communities. Other specific plans within the study area are:

- Rancho La Sierra (adopted 1996)
- Rancho La Sierra (Update in progress, proposed expansion area)
- Downtown (adopted 2002)

The City of Riverside is currently updating its General Plan. The City Planning Commission completed review and action on the Draft Plans on August 18, 2005. The next steps in the process include City Council Review and action on revised Draft Plans. The updated General Plan is anticipated to be tentatively adopted in late May 2006 or June 2006 (Hayes 2006).

City of Norco

General Plan

The City of Norco General Plan contains no specific goals and policies regarding the siting of a major transmission line.

City of Fontana

General Plan

The current General Plan was adopted in October of 2003. In addition, the City has adopted 14 Specific Plans and five Community Plans, with two more Specific Plans under consideration. Within the City's Sphere of Influence, the County of San Bernardino has adopted an Industrial Specific Plan. The current General Plan considers all these factors and sets the tone for future growth and development. Issues, Goals, Policies and Actions include the following:

Issue #2: Land Use Compatibility
Goal #2:

Policies:

2) Regionally beneficial land uses such as transportation corridors, flood control systems, utility corridors, and recreational corridors shall be sensitively integrated into our community.

5) Multiple uses within utility easements shall emphasize open spaces but may accommodate more intensive uses to safely augment adjacent uses.

Actions:

5) Administer a utility coordination program with utility providers to consolidate disruptions of public rights-of-way.

6) Coordinate with utility providers to determine which open space opportunities have potential and negotiate agreements accordingly.

Issue #9: Public Utilities
Goal #9

Policies:

2) The installation of utilities shall be coordinated so that disruption of public rights-of-way and private property is kept to a minimum.

3) Collaboration with utility companies shall occur to achieve the maximum undergrounding of utility lines commensurate with available funds.

Actions:

2) Establish and maintain a utility coordinating process to coordinate installation of utility pipes and lines in public rights-of-way and through private property. Include provisions for appropriately conditioning development projects.

3) Establish and maintain a utility undergrounding program.

One approved specific plan (Valley Trails SPL04-04) was identified in the study area.

City of Rialto

General Plan

The City of Rialto General Plan was adopted in 1992 and is currently being updated. The City of Rialto General Plan contains no specific goals and policies regarding the siting of a major transmission line.

City of Colton

General Plan

The City of Colton General Plan was adopted in 1987 and is currently being updated. The City of Colton General Plan contains no specific goals and policies regarding the siting of a major transmission line.

City of Grand Terrace

General Plan

The City of Grand Terrace General Plan was updated in 1989 and is currently being updated. The City of Grand Terrace General Plan contains no specific goals and policies regarding the siting of a major transmission line.

Multi - Species Habitat Conservation Plan (MSHCP)

In June of 2003, the Riverside County Board of Supervisors adopted the MSHCP to provide a regional conservation solution to species and habitat issues that have historically threatened to stall infrastructure and land use development. The MSHCP is a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) focusing on Conservation of species and their associated habitats in Western Riverside County. The MSHCP is a multi-jurisdictional effort that includes the unincorporated area of western Riverside County and 14 cities. The MSHCP covers 146 species and addresses biological diversity within 1.26 million acres, from west of the San Jacinto Mountains to the Orange County border. While protecting high-profile species like the Stephen's kangaroo rat and the Quino checkerspot butterfly, the MSHCP is primarily designed to protect more than 30 federally threatened and endangered species and conserve 510,000 acres, of which 347,000 acres are already in public and quasi-public ownership. The underlying goal of the MSHCP is to protect multiple species by preserving a variety of habitat and providing linkages between different habitat areas.

The MSHCP serves as an HCP pursuant to Section 10(a)(1)(B) of the Federal Environmental Species Act, as well as a Natural Communities Conservation Plan (NCCP) under the NCCP Act of 2001. Though the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) have authority to regulate the take of threatened and endangered species, consistent with the terms and conditions of approval of the MSHCP, the USFWS and CDFG have granted "Take Authorization" to participating jurisdictions in exchange for the assembly and management of coordinated MSHCP Conservation Areas for 146 "covered species" (including 14 narrow endemic plant species). Of the 146 "covered species," 118 species are considered "adequately conserved" within the MSHCP.

The Habitat Evaluation and Acquisition Negotiation Strategy (HANS) process is used by the County of Riverside to implement portions of the MSHCP by identifying and delineating conservation areas on specific properties. The HANS process applies to property that may be needed for inclusion in the MSHCP Conservation Area or subjected to other MSHCP Criteria and shall be implemented by the County and those Cities that have agreed to implement the HANS process. Under the incentive-based MSHCP program, the Western Riverside County Regional Conservation Authority (RCA), the County, Cities, or various State and Federal Agencies may obtain interests in property needed to implement the MSHCP over time (interest may be obtained in fee, conservation easement, deed restriction, land exchange, flood control easement or other type of interest acceptable to the RCA, the County, Cities, acquiring State and/or Federal Agency, and property owner). Fee ownership of property may not be required. If it is determined that all or a portion of property is needed for inclusion in the MSHCP Conservation Area, various incentives may be available to the property owner in lieu of or in addition to monetary compensation in exchange for the conveyance of a property interest.

A Criteria Cell is land (approximately 160 acres) that has been identified as an area where conservation potentially needs to occur.

The following Criteria Area/Criteria Cells were identified in the study area:

- Santa Ana River North
- Santa Ana River Central
- Santa Ana River South
- Delhi Sands Area
- Jurupa Mountains

Conserving lands within these areas would secure habitat for several sensitive species as well as maintain connections between key locations in the study area.

Riverside County Airport Land Use Compatibility Plan

Riverside County's Airport Land Use Commission (ALUC) periodically updates an Airport Comprehensive Land Use Plan, commonly known as an Airport Land Use Compatibility Plan. The Airport Land Use Compatibility Plan designates zones of airport-influenced areas for every airport in Riverside County and provides a series of policies and compatibility criteria to ensure that both aviation uses and surrounding uses may continue. The Airport Land Use Compatibility Plan includes provisions for two airports within or in the vicinity of the study area (Riverside Municipal Airport and Flabob Airport). The Comprehensive Land Use Plans for the airports are intended to protect and promote the safety and welfare of residents of the airport vicinity and users of the airport while ensuring the continued operation of the airports. Specifically, these plans seek to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

Riverside Municipal Airport

RI.1 Compatibility Map Delineation

1.1 Airport Master Plan Status: The most recent airport master plan was adopted by the City of Riverside in November 1999. The airport layout plan drawing was subsequently updated in January 2001.

1.2 Airfield Configuration: The Airport Master Plan proposes an easterly 750-foot extension of Runway 9-27. Establishment of a straight-in non-precision instrument approach to Runway 27 also is contemplated. The compatibility map for Riverside Municipal Airport takes into account the traffic patterns associated with both the existing and future runway ends and approach types.

1.3 Airport Activity: For the purposes of the Compatibility Plan, the Master Plan forecasts have been extended to a level anticipated to have a time horizon of 20+ years. Specifically, a projection of 220,000 annual operations, almost double the current level, is assumed. Essentially all of this growth is expected to be in operations by turboprop aircraft, business jets, and helicopters; single-engine airplane activity is projected to remain roughly constant.

1.4 Airport Influence Area: The instrument approach route and typical extent of the airport traffic pattern define the of the airport influence area boundary for Riverside Municipal Airport. To the east and west, this boundary mostly coincides with the outer edge of the airport's FAR Part 77 conical surface. A westward extension encompasses locations where aircraft on a precision instrument approach are lower than 1,000 feet above the airport elevation.

RI.2 Additional Compatibility Policies

2.2 Zone B2 Building Height: Not withstanding the limitation of two aboveground habitable floors indicated in Table 2A of Chapter 2, any nonresidential building in Compatibility Zone B2 at Riverside Municipal Airport may have up to three aboveground habitable floors provided that no such building or attachments thereto shall penetrate the airspace protection surfaces defined for the airport in accordance with Federal Aviation Regulations Part 77.

According to City of Riverside Zoning Codes, airport zone (AIR) and airport industrial (AI) zone restrict types of uses and heights of structures on and near the airport.

Flabob Airport

FL.1 Compatibility Map Delineation

1.1 Airport Master Plan Status: No master plan has been prepared for this privately owned airport. The airport layout plan prepared by the airport proprietor in 2003 serves as the basis for the *Compatibility Plan*.

1.2 Airfield Configuration: No modifications to the runway length or approach types are anticipated for Flabob Airport.

1.3 Airport Activity: The basic character of the airport's usage and the small size of the facility will limit future activity levels. For compatibility planning purpose, aircraft operations are assumed to reach no more than 43,400 per year, a 60% increase from the estimated 27,000 annual operations at present.

1.4 Airport Influence Area: The outer edge of the FAR Part 77 conical surface defines the airport influence area boundaries on the west and northeast. To the north, south, and southeast, the airport's impacts are less extensive and roads are therefore used to delineate the limits of the airport influence area.

Other Proposed Land Uses

Proposed land uses consist of large residential development proposals, which have been recently approved or are currently under consideration for approval by governmental agencies. Information regarding proposed land use was obtained through personal communication with agency planning staff. The following proposed projects would be located within the study area:

- Tract No. 33253 (City of Riverside)
- Tract No. 31894 (Riverside County)
- The Resort (Riverside County)
- Stonehill Estates (Riverside County)

3.1.1.4 Parks, Recreation, and Preservation Areas

As shown in Map 2 there are 35 existing and 6 planned parks, recreation and preservation facilities/areas within the study area (see Table 3-3).

Table 3-3 Existing and Planned Parks, Recreation, and Preservation Facilities/Areas within the Study Area

Existing Facility/Area	Jurisdiction
Hidden Valley Wildlife Area*	Riverside County Regional Park & Open-Space District
Santa Ana River Regional Park*	Riverside County Regional Park & Open-Space District
Martha McLean-Anza Narrows Park	Riverside County Regional Park & Open-Space District
Louis Robidoux Nature Center	Riverside County Regional Park & Open-Space District
Jensen-Alvarado Historic Ranch and Museum*	Riverside County Regional Park & Open-Space District
Rancho Jurupa Park*	Riverside County Regional Park & Open-Space District
Trujillo Adobe Historic Area	Riverside County Regional Park & Open-Space District
Fairmont Park*	City of Riverside Park, Recreation & Community Services
Agricultural Park	City of Riverside Park, Recreation & Community Services
Mt. Rubidoux Park	City of Riverside Park, Recreation & Community Services
Reid Park*	City of Riverside Park, Recreation & Community Services
Tequesquite Park	City of Riverside Park, Recreation & Community Services
Nichols Park	City of Riverside Park, Recreation & Community Services
Rutland Park	City of Riverside Park, Recreation & Community Services
Carlson Park	City of Riverside Park, Recreation & Community Services
Loring Park	City of Riverside Park, Recreation & Community Services
Ab Brown Soccer Complex	City of Riverside Public Utilities
Oak Park	City of Fontana Community Services and Recreation
Southridge Park	City of Fontana Community Services and Recreation
Village Park	City of Fontana Community Services and Recreation
Catawba Park	City of Fontana Community Services and Recreation
Martin Tudor Jurupa Hills Park* Jurupa Swim Lagoon & Waterslide	City of Fontana Community Services and Recreation
River Trails Park	City of Norco Parks, Recreation & Community Services

Existing Facility/Area	Jurisdiction
Jurupa Community Center/Wedding Garden/Skate Park	Jurupa Area Recreation and Park District
Rick Thompson Arena/Agate Park/Harvey Ball Field	Jurupa Area Recreation and Park District
Avalon Park/Wanamaker Gymnasium	Jurupa Area Recreation and Park District
Clay Park	Jurupa Area Recreation and Park District
Knowles Athletic Park	Jurupa Area Recreation and Park District
Laramore Park/Arena	Jurupa Area Recreation and Park District
Veterans Memorial Park/Pool/Community Center/Picnic Area	Jurupa Area Recreation and Park District
Wineville Park	Jurupa Area Recreation and Park District
Limonite Meadows Park	Jurupa Area Recreation and Park District
Feldspar Arena	Jurupa Area Recreation and Park District
Jurupa Mountains Cultural Center	Private
Big League Dreams Sports Park	Private
Planned Facility/Area	**Jurisdiction**
Savi Ranch Park	City of Riverside Park, Recreation & Community Services
Centennial Park	Jurupa Area Recreation and Park District
Horseshoe Lake Park	Jurupa Area Recreation and Park District
Glen Avon Heritage Park	Jurupa Area Recreation and Park District
Rio Vista Park (Sunnyslope)	Jurupa Area Recreation and Park District
Emerald Meadows (Rubidoux/Belltown)	Jurupa Area Recreation and Park District

*Land & Water Conservation Fund Grant Site (as of 3/30/2006). Section 6(f) resources are those acquired through the use of Land and Water Conservation Funds (LWCF). The LWCF (Public Law 88-578) was enacted by Congress to provide money to federal, state, and local governments to purchase lands for maintaining or enhancing recreational opportunities, clean water, wildlife habitat, scenic resources, historic sites, and wilderness areas (Land and Water Conservation Fund, 2003; U.S. Forest Service, 2003). Resources that have been purchased using LWCF cannot be converted to other than public outdoor recreation uses without the approval of the Department of Interior's National Park Service (NPS). Section 6(f) directs the NPS to assure that replacement lands of equal value, location, and usefulness are provided to mitigate conversions of these lands for other than public outdoor recreation uses.

3.1.1.5 National Trail

The National Trails System is a network of scenic, historic, and recreation trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs, promote the enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources, and encourage public access and citizen involvement.

Portions of two national trails (Juan Bautista de Anza National Historic Trail and Santa Ana River National Recreation Trail) are located within the study area. The Juan Bautista de Anza National Historic Trail, designated on August 15, 1990, commemorates the route followed by a Spanish commander, Juan Bautista de Anza, in 1775-76 when he led a contingent of 30 soldiers and their families to found a presidio and mission near the San Francisco Bay. This trail was also designated a National Millennium Trail on June 26, 1999. National historic trails commemorate historic (and prehistoric) routes of travel that are of significance to the entire Nation. They must meet all three criteria listed in Section 5(b)(11) of the National Trails System Act. Such trails are established by an Act of Congress.

The Santa Ana River Trail is a National Recreation Trail. The Santa Ana Watershed Project Authority (SAWPA) has been working with the Crest-To-Coast Partnership in assisting efforts to complete the entire Santa Ana River Crest-to-Coast Trail and add parkway elements to the river. The effort is funded by the counties and cities in the watershed and by environmental groups interested in facilitating the completion of the 110 miles of trail system. Three county parks districts, Orange County, San Bernardino County, and Riverside County are involved with help from the Wildlands Conservancy in completing this process. When completed, the bicycling, riding and hiking trail will extend from the Pacific Ocean to the San Bernardino Mountains, providing recreational and commuting opportunities in three Counties. National recreation trails also authorized in the National Trails System Act, are existing regional and local trails recognized by either the Secretary of Agriculture or the Secretary of the Interior upon application.

3.1.1.6 Mitigation Bank

A mitigation area is an area with resource value, where the owner records a conservation easement on the property and sells mitigation credits prior to the execution of a mitigation banking agreement with the Wildlife Agencies. Mitigation areas are permanently conserved and managed for natural resource values. Mitigation areas are intended to protect resources in large, connected areas in advance of the need for mitigation and therefore are considered a valuable tool for assembling the MSHCP Conservation Area.

The Santa Ana River Wetlands Mitigation Bank is located in the study area.

3.1.1.7 Trails and Bikeway System

The study area contains bicycle, pedestrian, and multi-purpose trails that traverse urban, rural, and natural areas. These trails accommodate hikers, bicyclists, equestrian users, and others as an integral part of the circulation system. These multi-use trails serve both as a means of connecting communities and activity centers throughout the study area and as an alternate mode of transportation. In addition to transportation, the trail system also serves by providing recreation and leisure opportunities.

3.1.1.8 Golf Courses

The following ten golf courses were identified in the study area:

- El Rivino Country Club
- Riverside Golf Club
- Fairmount Municipal Golf Course
- Oak Quarry Golf Club
- Country Village Golf Course
- Goose Creek Golf Club
- Paradise Knolls Golf Course
- Indian Hills Country Club
- Jurupa Hills Country Club
- Skylinks Golf Course

3.1.2 Visual Resources

3.1.2.1 Residences

Existing and planned residential areas are located throughout the study area, but are less prevalent on the northeast side of the study area, where topography does not allow development, and along the Santa Ana River corridor. A lower concentration of residential development occurs north and northwest of Belltown in the study area.

3.1.2.2 Parks, Recreation, and Preservation Areas

See Chapter 3.1.1.5 for important regional trails, parks, recreation, and preservation areas identified in the study area.

3.1.2.3 Travel Corridors

The following existing designated scenic roadway was identified in the study area:

- Mission Boulevard - City of Riverside Gateway/Planned Parkway
- Van Buren Boulevard - City of Riverside Gateway
- Jurupa Avenue - Proposed City of Riverside Scenic Boulevard
- Arlington Avenue - Proposed City of Riverside Scenic Boulevard/Planned Parkway
- University Avenue - City of Riverside Planned Parkway
- Market Street - City of Riverside Planned Parkway
- Cedar Avenue - San Bernardino County Scenic Highway

3.1.2.4 Other Areas

The City of Riverside, as detailed in the General Plan, identified cemeteries as sensitive scenic areas. The following cemeteries were identified in the project area with the City of Riverside:

- Crestlawn Memorial Park east of the intersection of California Avenue and Arlington Avenue in the southwest corner of the study area; and
- Evergreen Cemetery is located approximately between Redwood Drive and Cedar Street on the northwest end of 14th Street.

3.1.2.5 Jurisdictional Plans

__Federal__

No federal Laws, Ordinances, Regulations, and Standards (LORS) apply to visual resources in the project area for the purposes of identifying corridor feasibility.

__State__

There are no State eligible or designated scenic highways in the study area.

__Local__

Riverside County

Riverside County Land Use Policy LU 13.1 seeks to "preserve and protect outstanding scenic vistas and visual features for the enjoyment of the traveling pubic", and has designated scenic highways. There are no county scenic highways in the study area.

A large portion of the study area is under the jurisdiction of Riverside County. "Area Plans" that focus on geographical units are identified in the General Plan. Area Plans applicable to the project area include the Eastvale Area Plan, Jurupa Area Plan, and the Highland Area Plan. There are specific "policy areas" identified in these plans that contain special or unique characteristics that merit focused policies. The Jurupa Area Plan has ten policy areas, the Eastvale Area Plan has two policy areas, and the Highgrove Area Plan has three policy areas.

Relevant Eastvale and Jurupa Area Plan visual resource policies are detailed in Table 3-4 below.

Table 3-4 Relevant Area Plan Policies-Eastvale and Jurupa Area Plans

Eastvale Area Plan Policy Number	Jurupa Plan Policy Number	Policy
EAP 1.2	JURAP 7.2	Require development, where allowable, to be set back an appropriate distance from the top of bluffs, in order to protect the natural and recreational values of the river and to avoid public responsibility for property damage that could result from soil erosion or future floods.
EAP 1.3	JURAP 7.3	Encourage future development that borders the Policy Area to design for common access and views to and from the Santa Ana River.
EAP 1.13	JURAP 7.13	Discourage utility lines within the river corridor. If approved, lines shall be placed underground where feasible and shall be located in a manner to harmonize with the natural environment and amenity of the river.

The Highgrove Land Use Plan identifies the Highgrove Community Policy Area, with the following relevant visual resource policies:

HAP 1.2.c. In order to implement scenic recreational and transportation corridors and any regional trails proposed to connect thereto, development applications shall provide easements for public access along a project's perimeter or within or along areas of the project otherwise traversed by the rights-of-way dedicated to the public use.

HAP 1.2.e. Development applications that incorporate designated scenic recreational and transportation corridors within their project boundaries shall construct or cause to be constructed the following recreational and transportation amenities for the use and enjoyment of the general public, according to current applicable Riverside County standards:

1) A combination Class I bikeway and jogging trail.
2) An equestrian path.
3) Adequate vegetative or other buffering features between the above facilities to increase their attractiveness, to promote privacy, and to reduce any potential conflicts between uses.

San Bernardino County

Chapter 5 (Open Space/Recreation/Scenic), Section 8 of the 1989 San Bernardino General Plan (San Bernardino 1989) describes the County's scenic resources, and provides policies and standards which apply to the need to preserve important scenic vistas as part of the open space system (Goals C-55 through C-57, Policies OR-50 through OR- 58). Applicable Scenic Resource Goals for the County are as follows:

- Preserve and protect the outstanding scenic resources of the county for their continued future enjoyment (Goal C-55),
- Restrict development along scenic corridors (Goal C-56), and
- Provide for visual enhancement of existing and new development through landscaping (Goal C-57).

Within the study area, the Santa Ana River Trail is considered part of the county's scenic resources. In addition, features that have the following characteristics are specifically defined as being scenic that are potentially within the study corridor (Policy OR-50.b):

- Views of major mountain ranges or portions thereof, especially from urban areas (i),
- Areas containing significant biological resources as identified by the Biotic Overlay map (ii),
- Any natural blue line stream (viii),
- Regional Parks and their local access routes (xii), and
- Any portion of the regional trail system (xiii).

In addition, Policy OR-51 states that the County shall require the following:

Review of proposed development along scenic highways and trails shown on the Resource Overlay Maps to ensure preservation of scenic values for the traveling public and those seeking a recreational driving experience (a),

Encourage undergrounding of all utility facilities for all projects requiring discretionary or ministerial action (h), and

Control development on prominent ridgelines (j),

Policy OR-53 states that because preservation of scenic qualities is important to the County, development which would alter the character of visually significant resources should be prevented.

Policy OR-58 designates scenic highways within the county, with all applicable policies to development within the Scenic Corridor. Within the study area, Cedar Avenue from Bloomington Avenue south to Riverside County line is designated as a San Bernardino County Scenic Highway (within the East Valley Regional Planning Area).

City of Fontana

The City of Fontana adopted General Plan (2003) has a number of goals, policies, and actions relative to visual resources that are applicable to transmission line siting.

Within the Land Use Element of the plan, Goal #2 (G2) states seeks to avoid development that has "negative impacts on residence and businesses" and should be "compatible with, and enhance(s)" the natural and built environment. To that end, Policy #2 (G2) requires that regionally beneficial land uses such as transportation corridors, flood control systems, utility corridors, and recreational corridors shall be sensitively integrated into the community.

City of Riverside

The City of Riverside is undergoing a plan revision, which is currently in draft form (Draft Riverside General Plan 2005). The existing General Plan, adopted in 1994, identifies specific Goals and Policies regarding the management of visual resources.

"Goal OS1" was established to "create a system of open space areas and linkages throughout the General Plan Area that protects the natural and visual character of the community and provide for appropriate active and passive recreational uses." Policies for the implementation of Goal OS 1 include:

- Identification and location of open space areas and "scenic roadways" for the city (OS 1.1);
- The provision that the City should recognize the value of major institutional passive open spaces, particularly cemeteries, as important components of the total open space system and protect their visual character.

The City of Riverside established 14 concepts as a means to implement the Vision Statement that describes Riverside as a city "that builds on its past and present character to create a diverse and distinctive community of quality for the future." One of these concepts states that "distinctive gateways should clearly identify entrances into this City and help define" the boundaries. The Gateway is defined as a point along a roadway entering a city or a county at which a motorist gains a sense of having entered the city or county.

Goal CC 1 OF Section IV (Community Enhancement) seeks to use urban design policies to maintain and strengthen the identity of the City of Riverside as a community of character, quality, and diversity. Policy CC 1.1 identifies a series of key gateways into the City. These gateways include entrances from the north at the northerly City limits/County line on North Main Street, west via Highway 60, northeast via Highway 215 and Van Buren Boulevard, east via Highway 60 and Alessandro Boulevard, southeast via Trautwein Road, south via Mockingbird Canyon Road and La Sierra Avenue, southwest via Highway 91, and west via Arlington Avenue. These entry points define the physical boundaries of the community and emphasize its distinctive character to residents and visitors alike. General Plan policies and implementation measures related to City gateways shall apply to the gateways defined in this policy.

3.1.3 Cultural Resources

The results of the review show that 146 archaeological and historical surveys have been conducted within the project area. These surveys were performed by many different professionals using various methods and probably vary in the intensity and quality of survey coverage. Further review of these studies will be necessary to evaluate which portions of the project area have been surveyed for cultural resources according to modern standards. Some previously surveyed locations may require additional survey to confirm the absence of cultural resources.

As a result of the technical studies, 118 cultural resources are recorded with the California Historical Resources Information System (CHRIS). Of these, 28 are historic (usually Euro-American) and the remaining 90 are prehistoric (Native American). The historic sites include remnants of historic buildings (i.e., residences, a chapel, and a winery), irrigation facilities (i.e., canals and ditches), a quarry, roadways, historic town sites, and at least 11 historic refuse deposits or surface scatters. The 90 prehistoric sites include 61 bedrock milling stations and 20 lithic scatters containing stone flakes and tools (10 of the sites are both milling stations and lithic scatters). There are also four locations containing pictographs or petroglyphs. The majority of the prehistoric sites are located along the Santa Ana river drainage and in the Jurupa Mountains in the northern part of the project area.

Various historic structures within the project area have been determined eligible for listing in the National Register of Historic Places. Most of these structures occur in the older portions of downtown Riverside; many are within the City of Riverside's Historic Preservation Districts. Others consist of linear features, primarily irrigation canals or roads. One property -- a "Chinatown" neighborhood in Riverside -- is listed in the National Register. Records also show that one California Historical Landmark, a historic period cemetery, is located within the project boundaries.

Of the 119 resources identified, 72 have not been evaluated for National Register eligibility. Of the remainder, 39 were recommended as ineligible for inclusion in the National Register, three (a pictograph site and two canals) were recommended as eligible, three are listed on the National Register of Historic Places, one is a California Historic Landmark, and two have indeterminate eligibility. Eligibility recommendations were made by the cultural resource professionals preparing the inventory form and have not been reviewed by the TRC, POWER Engineers, or OHP.

NAHC staff are currently reviewing a request to the NAHC for information on Native American sacred lands or TCPs within the project boundary. At this time, there is no information available this class of cultural resource is located in the project area.

3.1.4 Biological Resources

3.1.4.1 Vegetation

Reconnaissance-level surveys were conducted within the study area to delineate vegetative communities and identify sensitive habitats. This information was subsequently used to help determine the potential occurrence of special status plant and animal species. The study area is located within the Riverside Lowlands Bioregion, which is characterized by a relatively arid climate and a high level of urbanization. Primary vegetation communities in the bioregion include Riversidean sage scrub and annual grasslands. Elevations in the study area range from 680 to 1,900 feet MSL. Most of the study area has been developed, and the only remaining large areas of native habitats occur along the Santa Ana River and in the Jurupa Mountains. There are also several smaller undeveloped areas (i.e., Pedley Hills and Mt. Rubidoux) that continue to support native vegetation.

Native vegetative communities in the study area include chaparral, Riversidian sage scrub, coastal and freshwater marsh, disturbed alluvial, riparian scrub, Riversidian alluvial fan sage scrub, southern cottonwood/willow riparian, and southern willow scrub. Non-native vegetative communities that occur in the area include disturbed, non-native grassland, and field croplands. A map of vegetative communities in the study area is presented in Map 5. The following presents brief summaries of each of these communities based upon descriptions presented in the MSHCP:

Chaparral – Chaparral occurs on the arid, upper slopes in the Jurupa Mountains. Chaparral is a shrub-dominated community that is composed largely of evergreen species that range from 3 to 12 feet in height. The primary species in this community is chamise (*Adenostoma fasciculatum*), with other common shrub species including manzanita (*Arctostaphylos* spp.), oak (*Quercus* spp.), laurel sumac (*Malosma laurina*), and mountain-mahogany (*Cercocarpus betuloides*). Less common species include sages (*Salvia* spp.), bush penstemon (*Keckiella* sp.), monkeyflower (*Mimulus aurantiacus*), nightshade (*Solanum* sp.), California buckwheat (*Eriogonum fasciculatum*), and a variety of herbaceous species. In the study area, chaparral is intergrades with Riversidian sage scrub and non-native grassland.

Riversidian Sage Scrub - Riversidian sage scrub is the primary native community within the study area. This community occurs on lower, undeveloped slopes throughout the area, including the Jurupa Mountains, Pedley Hills, Mount Rubidoux, and the extreme northeast corner of the study area. Riversidian sage scrub is dominated by a suite of short, aromatic, deciduous shrub species, including such as California sagebrush (*Artemisia californica*), California buckwheat, brittlebush (*Encelia farinosa*), California encelia (*Encelia californica*), black sage, white sage, blue elderberry (*Sambucus*

Mexicana), boxthorn (*Lycium* sp.), cholla (*Opuntia* sp.), and prickly-pear (*Opuntia* spp.). In the study area, Riversidian sage scrub intergrades with chaparral and non-native grassland.

Coastal and Freshwater Marsh – Several small patches of coastal and freshwater marsh occur along the Santa Ana River in the southwestern portion of the survey area. These areas are seasonally inundated and have standing water for part of the year. The coastal and freshwater marsh community supports native species including cattail (*Typha latifolia*), mulefat (*Baccharis salicifolia*), smartweed (*Polygonum* spp), stinging nettle (*Urtica dioica*), and willow (*Salix* spp.), as well as non-native species such as arundo (*Arundo donax*), poison hemlock (*Conium maculatum*), and tree tobacco (*Nicotiana glauca*).

Disturbed Alluvial - Disturbed alluvial habitats occur along the entire length of the Santa Ana River within the study area, and represent areas that have been disturbed by flooding events and changes in the river channel. These habitats are currently dominated by weedy species such as arundo, horehound (*Marrubium vulgare*), mustard, poison hemlock, tree tobacco, and wild radish. Disturbed alluvial communities intergrade with riparian scrub and southern cottonwood/willow riparian forest.

Riparian Scrub – A few small patches of riparian scrub are located along the central portion of the Santa Ana River. This community is dominated by shrubs, including arrow weed (*Pluchea sericea*), castor bean, mulefat, nightshade, with a few trees including southern California black walnut, (*Juglans californica*), tree tobacco, and willows.

Riversidian Alluvial Fan Sage Scrub - Riversidean alluvial fan sage scrub occurs on alluvial deposits along the Santa Ana River in the eastern portion of the study area. This community is dominated by scalebroom (*Lepidospartum squamatum*), white sage, California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), tarragon (*Artemisia dracunculus*), yerba santa (*Eriodictyon* spp.), and mule fat.

Southern Cottonwood/Willow Riparian - Southern Cottonwood/Willow Riparian habitats occur along the entire length of the Santa Ana River riparian corridor within the study area. This community is dominated by cottonwood (*Populus* spp.) and willow trees with occasional western sycamore (*Platanus racemosa*). Understory vegetation includes shrubs and herbaceous plants such as arundo, fiddleneck, mulefat, nettle, sowthistle, and wild radish. Southern Cottonwood/Willow Riparian habitats intergrade with riparian scrub and disturbed alluvial vegetation.

Southern Willow Scrub – A few small patches of southern willow scrub are located along tributaries of the Santa Ana River in the southwestern portion of the study area. This community is dominated by willows, particularly arroyo willow (*Salix lasiolepis*).

Disturbed - Disturbed areas occur throughout the study area, and generally occur on vacant lots and near roads and developed areas. These areas have been subjected to disturbance and are dominated by weedy species such as castor bean (*Ricinus communis*), cheeseweed (*Malva parvifolia*), fiddleneck (*Amsinkia menziesii*), filaree (*Erodium* sp.), mustard (*Brassica* spp.), sowthistle (*Sonchus oleraceus*), tree tobacco, wild radish (*Raphanus raphanistrum*), and non-native, annual grasses, including foxtail barley (*Hordeum murinum*), ripgut grass (*Bromus diandrus*), and wild oats (*Avena* spp). Scattered native species may be found within disturbed.

Non-native Grasslands - Non-native grasslands occur throughout the study area and are most widespread on level terrain and extending up slopes into Riversidian sage scrub or riparian habitats. These areas dominated by non-native, annual grasses, including foxtail barley, ripgut grass, and wild oats. Herbaceous, weedy species, including filaree, mustard, sowthistle, and wild radish, are also present to a lesser extent. Scattered native species may be found within areas of non-native grassland.

Field Croplands – Field croplands occur in the western portion of the study area along the I-15 corridor. Croplands either support various types of row crops or are fallow.

3.1.4.2 Wildlife

Habitats within the study area support a large number of amphibian, reptile, bird, and mammal species. Table 3-5 presents a list of species that were observed during field investigations. While this is not a comprehensive list of all species that occur in the area, it provides an indication of the general types of species and habitats that are present in the area.

Table 3-5 Wildlife Species Observed in the Study Area

Common Name	Scientific Name
gopher snake	*Pituophis melanoleucus*
side-blotched lizard	*Uta stansburiana*
western fence lizard	*Sceloporus occidentalis*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
American kestrel	*Falco sparverius*
Anna's hummingbird	*Calypte anna*
ash-throated flycatcher	*Myiarchus cinerascens*
barn swallow	*Hirundo rustica*
Bewick's wren	*Thryomanes bewickii*
black-headed grosbeak	*Pheucticus melanocephalus*
black phoebe	*Sayornis nigricans*
blue grosbeak	*Guiraca caerulia*
California towhee	*Pipilo crissalis*
Cassin's Kingbird	*Tyrannus vociferans*
cliff swallow	*Petrochelidon pyrrhonata*
common raven	*Corvus corax*
common yellowthroat	*Geothlypis trichas*
Cooper's hawk	*Accipiter cooperii*
European starling	*Sturnus vulgaris*
golden eagle	*Aquila chrysaetos*
great egret	*Ardea alba*
Hammond's flycatcher	*Empidonax hammondii*
hooded oriole	*Icterus cucullatus*
house finch	*Carpodacus mexicanus*
house sparrow	*Passer domesticus*
killdeer	*Charadrius vociferus*
Lark Sparrow	*Pooecetes gramineus*
lesser goldfinch	*Carduelis psaltria*
mallard	*Anas platyrhynchos*
mourning dove	*Zenaida macroura*
Nashville warbler	*Vermivora ruficapilla*

Common Name	Scientific Name
northern mockingbird	*Mimus polyglottos*
Nuttall's woodpecker	*Picoides nuttallii*
red-shouldered hawk	*Buteo lineatus*
red-tailed hawk	*Buteo jamaicensis*
roadrunner	*Geococcyx californianus*
rock dove	*Columba livia*
rock wren	*Salpinctes obsoletus*
Say's phoebe	*Sayornis saya*
song sparrow	*Melospiza melodia*
turkey vulture	*Cathartes aura*
western kingbird	*Tyrannus verticalis*
western meadowlark	*Sturnella neglecta*
western scrub-jay	*Aphelocoma californica*
white-crowned sparrow	*Zonotrichia leucophrys*
white-throated swift	*Aeronautes saxatalis*
Wilson's warbler	*Wilsonia pusilla*
yellow-rumped warbler	*Dendroica cornata*
Botta's pocket gopher	*Thomomys bottae*
California ground squirrel	*Spermophilus beecheyi*
coyote	*Canis latrans*
desert cottontail	*Sylvilagus audubonii*
long-tailed weasel	*Musetla frenata*

3.1.4.3 Special Status Species

Special status species include those listed as threatened, endangered, candidate, or proposed under the Federal Endangered Species Act (ESA) and those listed as threatened, endangered, or special concern under the California Endangered Species Act (CESA), and those included in the MSHCP. The native vegetative communities that occur within the study area provide suitable habitat for a number of special status plant and wildlife species. Based upon an evaluation of species habitat requirements and known distributions, a total of 91 of the 146 MSHCP species are likely to occur in the study area. The MSHCP includes species listed under the Federal and State ESAs. Table 3-6 presents a list of special status species that are known or likely to occur in appropriate habitats within the study area based upon information presented in the MSHCP, species accounts, and the CNDDB. This table also identifies the species' Federal and State status and the general habitat types in which they occur.

The Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) is a federally endangered species that is known to occur in the study area. This species is endemic to fine, sandy soils in the Delhi soil series. The Delhi sands flower-loving fly is typically found in relatively intact native habitats with less than 50% vegetative cover. All known extant populations of the Delhi Sands flower-loving fly occur within an 8 to 11-mile radius of each other within Riverside and San Bernardino counties. The distribution of the Delhi Sands flower-loving fly within Riverside is limited to the northern portion of the County in the vicinity of Mira Loma, Jurupa, and the Agua Mansa area.

Table 3-6 Special Status Species Likely to Occur in the Study Area

Common Name	Scientific Name	Status[1]	Habitat	Observed during survey
American bittern	*Botaurus lentiginosus*	--	Marshes, Riparian	-
Arroyo chub	*Gila orcutti*	SSC	Santa Ana River	-
Bald eagle	*Haliaeetus leucocephalus*	FT, ST	Riparian	-
Bell's sage sparrow	*Amphispiza belli belli*	SSC	Sage Scrub, Chaparral	-
Black-crowned night heron	*Nycticorax nycticorax nycticorax*	--	Marshes, Riparian	-
Black-tailed jackrabbit	*Lepus californicus bennettii*	SSC	Sage Scrub, Chaparral, NNG	-
Bobcat	*Lynx rufus californicus*	--	Sage Scrub, Chaparral, Santa Ana River	-
Brand's phacelia	*Phacelia stellaris*	--	Santa Ana River, sandy benches	-
Brush rabbit	*Sylvilagus backmanii cinerascens*	--	Sage Scrub, Chaparral	-
burrowing owl	*Athene cunicularia hypugaea*	SSC	Sage Scrub, Chaparral, NNG, Cropland	-
Cactus wren	*Campylorhynchus brunneicapillus cousei*	SSC	Sage Scrub	-
California gnatcatcher	*Polioptila californica californica*	FT, SSC	Sage Scrub, Chaparral	-
California muhly	*Muhlenbergia californica*	--	All habitats, moist areas	-
California newt	*Taricha torosa torosa*	SSC	Riparian	-
California Orcutt grass	*Orcuttia californica*	FE, SE	Vernal pools	-
Coast horned lizard	*Phrynosoma coronatum blainvilli*	SSC	All habitats	-
Coastal western whiptail	*Cnemidophorus tigris multiscutatus*	--	Sage Scrub, Chaparral, NNG	-
Cooper's hawk	*Accipiter cooperii*	SSC	Riparian, Santa Ana River	yes
Coyote	*Canis latrans clepticus*	--	All habitats	yes
Delhi sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE	Delhi Sands	-
Desert woodrat	*Neotoma lepida intermedia*	SSC	Sage Scrub, Chaparral, NNG	-
double-crested cormorant	*Phalacrocorax auritus*	SSC	Open water	-
Downy woodpecker	*Picoides pubescens turatie*	--	Riparian, Santa Ana River	-
Dulzura kangaroo rat	*Dipodomys simulans*	--	Sage Scrub, Chaparral	-
ferruginous hawk	*Buteo regalis*	SSC	All habitats	-
Golden eagle	*Aquila chrysaetos canadensis*	SSC	Sage Scrub, Chaparral	yes

Common Name	Scientific Name	Status[1]	Habitat	Observed during survey
Graceful tarplant	*Holocarpha virgata elongata*	--	Sage Scrub, Chaparral	-
Granite night lizard	*Xantusia henshawi*	--	Sage Scrub, Chaparral with rock outcrop	-
Granite spiny lizard	*Sceloporus orcutti orcutii*	--	Sage Scrub, Chaparral with rock outcrop	-
Grasshopper sparrow	*Ammodramus savannarum*	--	Grasslands	-
Great blue heron	*Ardea herodias*	--	Riparian, Open water, Santa Ana River	-
Hammitt's clay-cress	*Sibaropsis hammittii*	--	Sage Scrub, Chaparral	-
Horned lark	*Eremophila alpestris actia*	SSC	Grasslands	-
Intermediate mariposa	*Calochortus weedii intermedius*	--	Sage Scrub, Chaparral	-
Large-leaf filaree	*Erodium macrophyllum*	--	Sage Scrub, NNG	-
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE	Riparian, Santa Ana River	-
Lincoln's sparrow	*Melospiza lincolnii- breeding*	--	All habitats	-
Little mousetail	*Myosurus minimus apus*	--	Vernal pools	-
Loggerhead shrike	*Lanius ludovicianus gambeli*	SSC	All habitats	-
long-spined spine flower	*Chorizanthe polygonoides var. longispina*	--	Sage Scrub, Chaparral, Grassland, Clay soil	-
Long-tailed weasel	*Mustela frenata latriostra*	--	Riparian, Santa Ana River	yes
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC	Sage Scrub, NNG	-
Many-stemmed dudleya	*Dudleya multicaulis*	--	Sage Scrub, Chaparral	-
Merlin	*Falco columbarius*	SSC	All habitats	-
Mountain plover	*Charadrius montanus*	SSC	NNG, cropland	-
Munz's onion	*Allium munzii*	FE, ST	Sage Scrub, Chaparral	-
Nashville warbler	*Vermivora ruficapilla ridgwayi*	--	Riparian, Santa Ana River	yes
Nevin's barberry	*Berberis nevinii*	FE, SE	Sage Scrub, Chaparral	-
Northern harrier	*Circus cyaneus hudsonius*	SSC	NNG, cropland	-
Orange-throated whiptail	*Cnemidophorus hyperythrus beldingi*	SSC	Sage Scrub, Chaparral, Riparian	-
Osprey	*Pandion haliaetus carolinensis*	SSC	Riparian, Santa Ana River	-
Palmer's grapplinghook	*Harpagonella palmeri palmeri*	--	Sage Scrub, Chaparral, NNG	-
Parry's spineflower	*Chorizanthe parryi parryi*	--	Sage Scrub, Chaparral	-

Common Name	Scientific Name	Status[1]	Habitat	Observed during survey
Peninsular spineflower	*Chorizanthe leptotheca*	--	Sage Scrub, Chaparral	-
Peregrine falcon	*Falco pereginus*	SE	Santa Ana River	-
Plummer's mariposa lily	*Calochortus plummerae*	--	Sage Scrub, Chaparral	-
Prairie falcon	*Falco mexicanus*	SSC	Rocky outcrops and cliffs, grasslands	-
Prostrate spineflower	*Chorizanthe procumbens*	--	Sage Scrub, Chaparral, NNG	-
Purple martin	*Progne subis subis*	SSC	Riparian, NNG	-
Red diamond rattlesnake	*Crotalus ruber ruber*	SSC	Sage Scrub, Chaparral, NNG, Riparian	-
Rufous-crowned sparrow	*Aimophila ruficeps canescens*	SSC	Sage Scrub, Chaparral	-
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE, SSC	Sage Scrub, Disturbed Alluvial, Riparian	-
San Diego ambrosia	*Ambrosia pumila*	--	NNG, Vernal pools	-
San Diego banded gecko	*Coleonyx variegatus abbotti*	SSC	Sage Scrub, Chaparral	-
San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC	Sage Scrub, Chaparral, NNG, cropland	-
San Miguel savory	*Satureja chandleri*	--	Sage Scrub, Chaparral, NNG, Riparian	-
Santa Ana River woollystar	*Eriastrum densifolium sanctorum*	FE, SE	Santa Ana River	-
Santa Ana sucker	*Catastomus santaanae*	FT, SSC	Santa Ana River	-
Sharp-shinned hawk	*Accipiter striatus velox*	SSC	Riparian	-
Small-flowered microseris	*Microseris douglasii var. platycarpha*	--	Grasslands, Vernal pools	-
Small-flowered morning-glory	*Convolvulus simulans*	--	Sage Scrub, NNG	-
Southern California black walnut	*Juglans californica californica*	--	Sage Scrub, Riparian	yes
Southwestern pond turtle	*Clemmys marmorata pallida*	SSC	Riparian	-
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE, SE	Riparian	-
Spreading (=Ditch) navarretia	*Navarretia fossalis*	FT	Vernal pools	-
Stephens' kangaroo rat	*Dipodomys stephensi*	FE, ST	Sage Scrub	-
Swainson's hawk	*Buteo swainsoni*	ST	NNG, Riparian, cropland	-
Thread-leaved brodiaea	*Brodiaea filifolia*	FT, SE	NNG, Vernal pools	-
Tree swallow	*Tachycineta bicolor*	--	NNG, Riparian, Freshwater Marsh	-

Common Name	Scientific Name	Status[1]	Habitat	Observed during survey
Tricolored blackbird	*Agelaius tricolor*	SSC	Riparian, NNG, Marshes, Croplands	-
Turkey vulture	*Cathartes aura meridionalis*	--	NNG, Chaparral, Sage Scrub, Riparian	yes
Vernal barley	*Hordeum intercedens*	--	Vernal pools	-
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Vernal pools	-
Western spadefoot	*Scaphiopus hammondii*	SSC	Vernal pools	-
Western yellow-billed cuckoo	*Coccyzus americanus occidental*	FC, SE	Riparian, Santa Ana River	-
White-faced ibis	*Plegadis chihi*	SSC	Freshwater Marshes, NNG, cropland	-
White-tailed kite	*Elanus leucurus majusculus*	--	NNG, Riparian, cropland	-
Wilson's warbler	*Wilsonia pusilla pileolata*	--	Riparian, Chaparral, croplands	yes
Wright's trichocoronis	*Trichocoronis wrightii wrightii*	--	Vernal pools	-
Yellow warbler	*Dendroica petechia brewsteri*	SSC	Riparian	-
Yellow-breasted chat	*Icteria virens longicauda*	SSC	Riparian	-

[1]Status designations:
FE= Federal Endangered
FT= Federal Threatened
FC= Federal Candidate
SE= State Endangered
ST= State Threatened
SSC=State Species of Special Concern

3.1.5 Water Resources and Wetlands

The study area lies within the Santa Ana River watershed. This watershed is located within one of the fastest growing areas in California. As this watershed is located in an arid region, little natural perennial surface water is present.

The Santa Ana River is located along the southern and eastern border of the study area and is the most prominent water resource. The Santa Ana River flow is primarily perennial and includes treated wastewater discharges, urban runoff, irrigation runoff, and groundwater forced to the surface by shallow/rising bedrock.

Within the study area, 100-year floodplains present are primarily associated with the Santa Ana River. Narrower 100-year floodplains are present along several man-made channels and ditches in the study area (Map 5).

Wetlands in the study area are also associated with the Santa Ana River. Riparian communities occur along the entire length of the Santa Ana River and several small patches of coastal and freshwater marsh communities occur along the Santa Ana River in the southwestern portion of the study area (Map 5). See Section 3.1.4.1 Biological Resources for a description of these plant communities.

Several small lakes/reservoirs are present in the study area, including Lake Evans, Hole Lake, and Horseshoe Lake.

3.1.6 Geohazards

The study area lies within the boundary between the Transverse Mountain Ranges to the north and the Peninsular Mountain Ranges to the south. Although no active or potentially active faults are known to exist within the study area, the study area does lie within a region with several active fault lines: the San Andreas, the San Jacinto, the Elsinore and the Cucamonga faults. The San Andreas fault is located along the south side of the San Bernardino Mountains, approximately 10 miles north of the study area. The San Jacinto fault lies approximately 2 miles northeast of the study area, the Elsinore fault lies approximately 8 miles west to southwest of the study area and the Cucamonga is approximately 9 miles north.

Liquefaction susceptibility is strongest in sands and recently-deposited alluvial soils where the ground water depth is less than fifty feet below the surface. Within the study area, the alluvial plain south of the Jurupa Mountains and the Santa Ana River flood plain both posses soil types and groundwater characteristics that render them susceptible to liquefaction (Map 9).

Although the study area contains many hills and several small mountains, the natural slope in the majority of the area is less than 15%. Only on the hills and Jurupa Mountains do slopes become steeper, ranging from 15 – 45%.

CHAPTER 4: SENSITIVITY ANALYSIS RESULTS

4.1 INTRODUCTION

The sensitivity analysis process involves evaluating the data collected for each component and assigning appropriate sensitivity levels to that inventory. Methods used for this evaluation are outlined in Chapter 2. The specific sensitivities identified for each resource are listed below. This chapter also presents the results of the composite sensitivity analysis. Based upon the sensitivity analyses, a set of alternatives for the RTRP project components were developed. These alternatives are described in the last section of this chapter.

4.2 RESOURCE AREAS

4.2.1 Land Use

Land use sensitivity mapping was developed (Map 3) to reflect the sensitivity of land use resources relative to the development of alternative routes. Table 4-1 identifies specific land use components that were mapped within the study area and the corresponding sensitivity levels.

Table 4-1 Land Use Sensitivity

Land Use Component	Exclusion	High Avoidance	Moderate Avoidance	Low Avoidance or Opportunities
Airport	•			
Residential (existing) – Assumes non-removal of residences. Actual distances to residences would be dictated by Public Utility Commission's General Order (GO) 95 "Rules for Overhead Electric Line Construction".	•			
School (School Site and Facilities)	•			
Residential (planned)		•		
School Buffer Zones – California Department of Education guideline is 150 feet from the edge of an easement for a 220-230 kV line. This guide has been designed to help school districts select and gain state approval for school sites.		•		
National Trail		•		
County/City/Private Park, Recreation, and Preservation Area		•		
Mitigation Bank		•		
Multiple – Species Habitat Conservation Plan Criteria Area/Criteria Cell		•		
County Scenic Highway		•		
Active Landfill		•		
Commercial			•	
Golf Course			•	

Agriculture			•	
Industrial				•
Vacant/Undeveloped				•
Roads (Interstate, State Highway, County Road)				•
Railroads*				•
Transmission Lines				•

* Although considered an opportunity, construction, operation, maintenance, repair or removal of a transmission line, in close proximity to a railroad, could create interference issues. Interference includes, but is not limited to, physical interference from electromagnetic induction, electrostatic induction, or from stray or other currents, with the operation, maintenance or use of right-of-way, tracks, structures, pole lines, signal or communication lines, radio or other equipment, devices or other property appurtenances. As a result, appropriate mitigation/protection may be necessary.

4.2.2 Visual Resources

Potential visual impacts to recreational viewers and along officially designated corridors will potentially be high for all significant resources identified. High sensitivity is typically expected for residential areas and residences regardless of the setting. For users of parks, recreation and special trails in an urban environment such as one that occurs in the project area, high sensitivity is also expected for these areas due to the high use coupled with high user expectation (user attitudes). For designated scenic roadways, gateways and City of Riverside cemeteries, official designation and specific references in LORS specifically identify that scenic beauty and visual quality are an important, if not primary, considerations during the planning process. Therefore, all of these areas inventoried may potentially cause high impacts on visual resources within the project area, and therefore have High Avoidance Level.

Because of the dominance of residential areas and abundant parks and recreation sites in the study area coupled with ½ mile buffering, most of the study area is located in a High Avoidance Level designation. Visual resources do not significantly contribute to the identification of routing options at this level of detail, and therefore the visual resource sensitivity map was not used in producing the Composite Sensitivity Map.

4.2.3 Cultural Resources

A general sensitivity rating was determined for specific portions of the project area to distinguish areas of high and low sensitivity based upon the areas potential for cultural resources. High sensitivity was based on: 1) the presence of known archaeological or historical site distributions; 2) geographical features that are known to contain numerous cultural resources; and 3) large parcels of unsurveyed and undeveloped land for which there is no information available on cultural resources and which appear to be undisturbed. Areas low in cultural resource sensitivity are: 1) previously surveyed parcels that do not contain cultural resources; and 2) recently developed areas that area unlikely to contain intact or undisturbed cultural resources. High and low sensitivity areas for cultural resources are illustrated in Map 4.

These broadly categorized areas were mapped as a GIS cultural resources sensitivity layer for future planning considerations. High sensitivity areas for cultural resources are located along the Santa Ana River drainage and in the Jurupa Mountains in the northern part of the project area. The remainder of the project area is classified as low sensitivity.

The sensitivity assessment was based on existing records only and has not been confirmed in the field. Overall, less than 50 percent of the project area has been surveyed for archaeological and historical resources. It is likely that future surveys of the currently unsurveyed portions of the project area will result in the identification of additional sensitive cultural resources and of locations that definitely do not contain cultural resources. Until a response is received from the California NAHC, it is not possible to state whether sacred sites or TCPs exist within the project boundaries.

4.2.4 Biological Resources

Sensitivity ratings were developed to reflect the sensitivity of biological resources relative to the development of alternative corridors (Table 4-2). Since all of the native vegetative communities in the study area support special status plant and wildlife species, the sensitivity classifications for biological resources are based upon habitat types. The specific biological resource components and the corresponding sensitivity levels were mapped and included in the composite sensitivity analysis (Map 6).

Table 4-2 Biological Sensitivity

Biological Component	Exclusion	High	Moderate	Low
Chaparral		•		
Riversidian Sage Scrub		•		
Coastal and Freshwater Marsh		•		
Disturbed Alluvial		•		
Riparian Scrub		•		
Riversidian Alluvial Fan Sage Scrub		•		
Southern Cottonwood/Willow Riparian		•		
Southern Willow Scrub		•		
Undeveloped Delhi Soils (potential habitat for the Delhi Sands flower-loving fly)		•		
Disturbed				•
Non-native Grassland				•
Field Croplands				•
Developed portions of the Study Area				•

4.2.5 Water Resources and Wetlands

Sensitivity ratings were developed to reflect the sensitivity of water resources and wetlands relative to the identification of transmission line corridors (Table 4-3). Sensitivity levels for water resources were largely based upon their hydrological capacity, potential to affect engineering and design, and accessory benefits (e.g., plant and wildlife habitat). Where practical, the number of stream, river, and lake crossings will be minimized; additionally, due to engineering constraints, portions of lakes or river channels that exceed allowable span widths will be excluded. The specific water resource components and the corresponding sensitivity levels were mapped and included in the composite sensitivity analysis (Map 8).

Table 4-3 Sensitivity Ratings for Water Resources and Wetlands

Resource Component	Sensitivity Level			
	Exclusion	High	Moderate	Low
100-Year Floodplains			•	
Wetlands			•	
Lakes/Reservoirs/River Channel		•		
Ditches/Channels/Canals				•

4.2.6 Geohazards

Although no active or potentially active faults are known to exist in the study area, the study area does lie within a region that is seismically active. Four major active faults considered to have the greatest impact on the study area are the San Andreas, San Jacinto, Elsinore and Cucamonga Faults. The San Andreas fault is estimated to have the capability of producing a magnitude (M) 8.3 earthquake. The San Jacinto fault is estimated to be capable of a 7.0M earthquake, while the Elsinore fault is estimated to be capable of producing a 6.0M earthquake. The Cucamonga fault is estimated to be capable of a 7.0M event. Given the proximity of four active faults capable of producing moderate to strong earthquakes, it is reasonable to assume that seismic shaking poses a potential hazard to transmission lines within the study area.

Liquefaction is a phenomenon in which saturated, cohesionless soils lose their strength due to the build-up of excess pore water pressure during cyclic loading such as that induced by earthquakes. The primary factors affecting the liquefaction potential of a soil deposit are: 1) intensity and duration of earthquake shaking, 2) soil type and relative density, 3) overburden pressures, and 4) depth to groundwater. Soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands, and not-plasticed silts that are saturated. Silty sands have also been proven susceptible to liquefaction. Liquefaction susceptibility is strongest in sands and geologically-recent alluvial soils where the ground water depth is less than fifty feet below the surface. The plain south of the Jurupa Mountains is composed of alluvial deposits which are highly susceptible to liquefaction during an earthquake, and have been mapped as having a high potential for liquefaction. Areas containing soil deposits of late Holocene age, such as current river channels and their historic floodplains and marshes, and where the ground water level is less than fifty feet below the surface, are very highly susceptible to liquefaction. The Santa Ana River and much of its flood plain posses these characteristics, and has been mapped as having a very high potential for liquefaction (Map 9).

Given the relative lack of slopes greater than 45% within the study area, it is unlikely that steep slopes will prevent the routing of transmission lines; however, the gentle natural slope of the greater portion of the study area combined with soils highly or very highly susceptible to liquefaction present an additional liquefaction hazard. Lateral spread is a type ground surface deformation in which surface sediments displace laterally above a zone of liquefaction in a subsurface layer, and typically occurs on gentle slopes (less than 15%). Lateral spreads may displace surface sediments up to tens of meters. Such movement typically damages structures that have shallow foundations, such as utility structures. See Map 10 for overall Geohazards Sensitivity within the study area.

4.3 COMPOSITE SENSITIVITY ANALYSIS

A composite sensitivity map was developed by overlaying the individual resource sensitivity maps. The map indicates the highest sensitivity for a particular area. For example, if a particular site was identified as high sensitivity on biological resources and low sensitivity for all other resources, then it is identified as high on the composite map. This map provides an overview of resource sensitivities for the project area (Map 11).

CHAPTER 5: CORRIDOR AND ROUTE SELECTION RESULTS

5.1 INTRODUCTION

Following the mapping of resource sensitivity constraints, GIS layers were overlaid to create a composite sensitivity map (Appendix A, Map 11). Utilizing this map to avoid highly sensitive resources, corridors were identified in which transmission lines could be routed (see Appendix A, Map 12).

Corridors are described below:

5.2 230 KV TRANSMISSION LINE CORRIDORS

Santa Ana River West Corridor

The Santa Ana River West Corridor generally follows the Santa Ana River from the proposed Jurupa substation west to I-15, covering the entire width of the river channel from between 1/3 of a mile to 1 ½ miles at the widest section. South of 68th Street the Corridor turns north, paralleling the eastern side of I-15 to Mira Loma-Vista #1 transmission line. The Corridor widens near Limonite Avenue to encompass existing commercial and agricultural areas.

Central Corridors

Two alternative corridors have been determined in the central-western portion of the Study area. The first follows the Santa Ana River West Corridor from the proposed Jurupa Substation to Bain Street. The Bain Street corridor is located between residential on both the west and east sides of the street. This corridor follows Bain Street north to Belgrave Avenue. At this point, the Corridor widens to encompass the Union Pacific Railroad Automobile Distribution Center and other industrial complexes, with the southern edge following existing SCE transmission lines to the existing SCE Mira Loma-Vista #1 230 kV transmission line. The northeastern edge of this Corridor follows Van Buren Boulevard to the existing SCE Mira Loma-Vista #1 230 kV transmission line, which forms the northwestern boundary.

The second Corridor follows the Santa Ana River West Corridor from the proposed Jurupa Substation to Van Buren Boulevard. The corridor then follows Van Buren Boulevard and the Union Pacific Railroad north to the Mira Loma-Vista #1 transmission line near the Union Pacific Railroad Automobile Distribution Center.

Santa Ana River East Corridors

The Santa Ana River East Corridor follows the Santa Ana River from the proposed Jurupa Substation northeast. The corridor encompasses the entire river corridor to the Mira Loma-Vista #1 transmission line approximately 2 miles west of the Vista Substation.

North of the Riverside-San Bernardino County Line, the corridor widens to include the predominantly industrial and agricultural areas on the north side of the Santa Ana River. The corridor includes those areas to the east and west of Riverside Avenue.

At Market Street, a second Corridor branches off, following Market Street north to Agua Mansa Road. The corridor then heads to the north and northeast. The north corridor generally follows Rubidoux

Boulevard to Mira Loma-Vista #1 about ½ mile north of the Riverside/San Bernardino County Line. Another section of the corridor, heading northeast from Market Street, follows Agua Mansa Road from Market Street to Mira Loma-Vista #1.

5.3 230 KV ALTERNATIVE ROUTES

Within the corridors described above, assumed centerlines for the proposed transmission line were identified. These centerlines represent a general location for the proposed transmission line. They were identified by utilizing sensitivity mapping, the identified corridors, and aerial photography. The alternatives are generally described below, and are displayed on Map 12, Appendix A.

Santa Ana River West Corridor

The alternative route within the Santa Ana River West Corridor leaves the proposed Jurupa Substation and generally follows the City of Riverside boundary line and an existing SCE transmission line along the southern bank of the Santa Ana River (see Photo 1), to a point approximately 1 mile east of I-15 (north of California Avenue), where the route crosses the Santa Ana River. Approximately 1/3 mile south of 68th Street the route turns north, and parallels the eastern edge of I-15 to connect with Mira Loma-Vista #1, a distance of about 3 miles.

Photo 1: Looking east at existing SCE transmission line along southern bank of Santa Ana River.

Central Corridors

The first alternative route would be located on the north side of the Santa Ana River from Van Buren Boulevard west to Bain Street (see Photo 2). A second alternative would continue along the alternative within the Santa Ana River West Corridor described above, and would cross the Santa Ana River near the Hidden Valley Nature Center (see Photo 3). Here the routes continue up the eastern edge of Bain Street to Van Buren Boulevard, within an existing Southern California Gas right-of-way (see Photo 4). The route would then turn northwest and follow the Union Pacific/MetroLink ROW adjacent to Van Buren Boulevard to connect to Mira Loma-Vista #1.

The third alternative route leaves the proposed Jurupa Substation and crosses the Santa Ana River approximately 1/3 mile north of the RERC Substation (see Photo 5), and generally follows the river for approximately 1 mile west to Van Buren Boulevard. At this point, there are several alternative segments heading north to the Union Pacific/MetroLink ROW. The route would continue north between the Union Pacific Railroad and Van Buren Boulevard (see Photo 6) to the alternative route described above as the first alternative.

The fourth alternative route would be located west from Van Buren Boulevard on the north side of Bellegrave Avenue for approximately ½ mile then turns west, following an existing SCE 69 kV transmission line along Galena Street to connect to Mira Loma-Vista #1 near the intersection of Galena Street and Wineville Road (see Photo 7).

Photo 2: Area along north side of Santa Ana River, between Van Buren Boulevard and Bain Street.

Photo 3: Looking north at the Santa Ana River crossing adjacent to the Hidden Valley Nature Center.

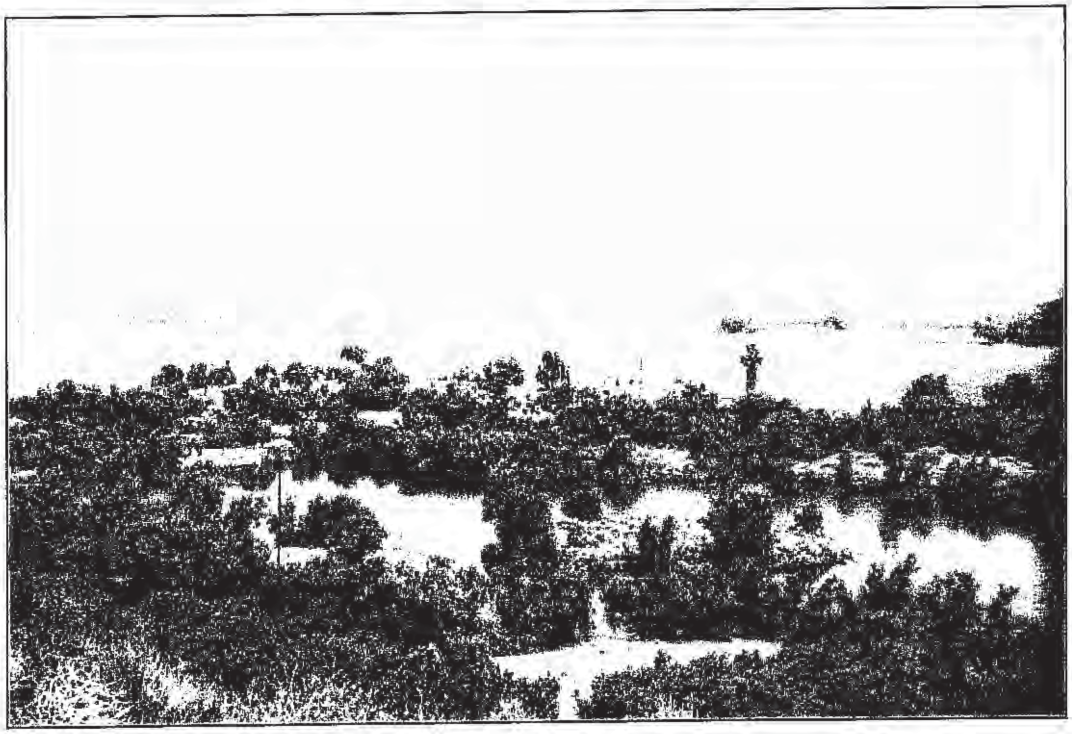


Photo 4: Looking north along Southern California Gas right-of-way, adjacent to Bain Street.

Photo 5: Potential crossing of Santa Ana River, near the proposed Jurupa Substation.

Photo 6: Looking south at area between Van Buren Boulevard and Union Pacific Railroad.

Photo 7: Western view down Galena Street and the existing SCE 69 kV transmission line along the south side of the street, near Jurupa Valley High School.

Santa Ana River East Corridors

The alternative routes within the Santa Ana River East Corridor would leave the proposed Jurupa Substation and travel northeast, generally paralleling the Riverside City Boundary, along the south side of the Santa Ana River and parallel to existing RPU 69 kV transmission lines (see Photo 8) to Mission Boulevard. Beyond Mission Boulevard there would be two alternative routes; one located on both the south and north sides of the Santa Ana River (see Photo 9). These alternatives would continue adjacent to the river northeast to the Mira Loma-Vista #1 transmission line (see Photo 10).

Two alternative crossings of the Santa Ana River have been identified through the study. The first would be located between Mission Boulevard and SR-60. The second would be located along adjacent to the Market Street Bridge crossing the Santa Ana River.

Several other alternative routes would be located adjacent to roadways north of the Santa Ana River, within the northeast portion of the Study Area. One alternative would follow Market Street from the Santa Ana River on the east side to Agua Mansa Road. At Agua Mansa Road, the route turns northeast, and follows Agua Mansa Road on the north side for approximately ¾ mile to Riverside Avenue. At the intersection of Agua Mansa Road and Riverside Avenue there are two alternatives: one continues north along the west side of Riverside Avenue to the Mira Loma-Vista #1 transmission line, and the second continues along the north side of Agua Mansa Road to the Mira Loma-Vista #1 transmission line. Another segment within this area would leave the Santa Ana River alternatives at the crossing of Riverside Avenue over the river. The alternative would be located on the east side of Riverside Avenue north to the intersection of Riverside Avenue and Agua Mansa Road.

Photo 8: Western view of existing 69 kV transmission line along the Santa Ana River, east of Martha McLean Anza Narrows Park.

Photo 9: Looking east along south side of Santa Ana River from Mission Boulevard.

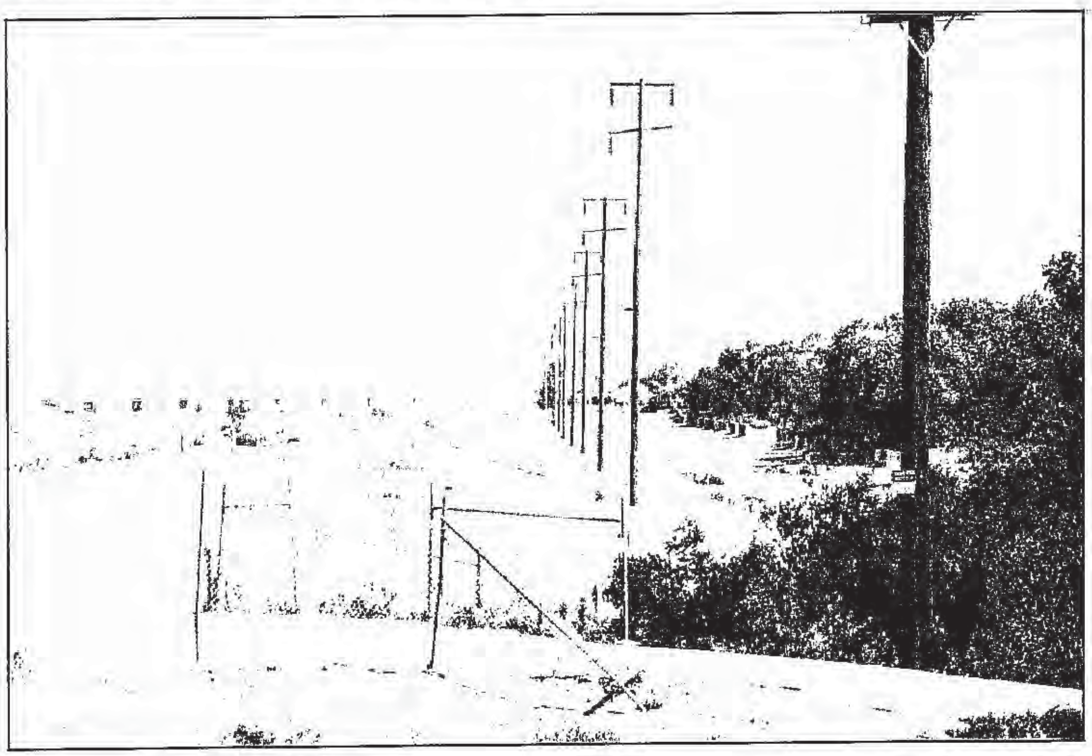
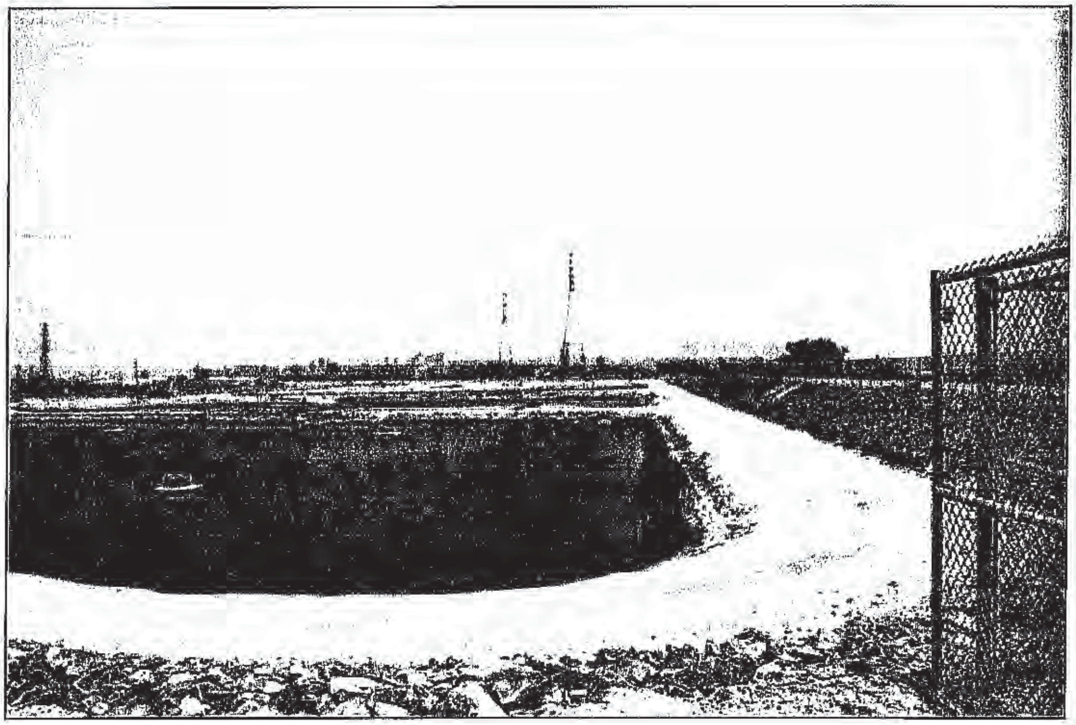


Photo 10: Possible tap point on the north side of the Santa Ana River on the Mira Loma-Vista #1 transmission line.



5.4 69 KV TRANSMISSION LINES

Several 69 kV circuits would be necessary as part of the RTRP. These transmission lines would transfer the electrical power and connect the proposed Jurupa Substation into the existing RPU electrical system. The 69 kV circuits were identified through the electrical system study performed by RPU. These circuits would include two double-circuit 69 kV transmission lines interconnecting the proposed Jurupa Substation to the existing RERC-Mt. View double-circuit 69 kV transmission line, and one double-circuit 69 kV transmission line connecting the proposed Jurupa Substation to the Mt. View Substation. Alternative alignments for these proposed transmission lines were considered for the project. Both the preferred alignments and the alternatives considered are displayed on Figures 5-1, and 5-2.

Jurupa to RERC-Mt. View

Two double-circuit 69 kV transmission lines would be needed for this segment. One transmission line would leave the proposed Jurupa Substation directly to the west and would be located on the west side of Wilderness Avenue, south to Jurupa Avenue where it would interconnect to the existing RERC-Mt. View 69 kV transmission line. One alternative was evaluated. The alternative route would immediately head south after leaving the proposed substation on the west side, and would be located on the north side of Ed Perkic Street, then would continue south on the west side of Wilderness Avenue. This alternative was not selected due to engineering constraints including additional, unnecessary angles and additional cost. The second transmission line would leave the proposed Jurupa Substation from the south side, and would be located on the south side of Ed Perkic Street, and then the east side of Wilderness Avenue south to the existing RERC-Mt. View 69 kV transmission line.

Jurupa to Mt. View

The double-circuit 69 kV transmission line connecting the proposed Jurupa Substation to the existing Mt. View Substation would include both overhead and underground segments of transmission line. This segment also had one alternative that was considered. The preferred route would leave the proposed Jurupa Substation from the south and would continue east along the north side of Ed Perkic Street to Columbia Avenue. The route would then be located on the north side of Columbia Avenue, avoiding the majority of commercial properties adjacent to the street, to a point approximately 200 feet north of Jurupa Avenue. From this point, both 69 kV circuits would be located underground crossing Jurupa Avenue and continuing south on Fremont Street and then east on Mountain View Avenue to the Mountain View Substation.

The alternative considered for this route would head south within an existing Metropolitan Water District of Southern California (MWD) aqueduct right-of-way. At Jurupa Avenue, the alternative would be located underground for approximately ½ mile to Fremont Street, where it would continue to the Mt. View Substation as described above for the preferred route. This alternative was not selected in order to avoid the MWD right-of-way, and to avoid additional construction along Jurupa Avenue. The alternative would also have substantial additional costs (approximately 3.5 million dollars) due to the additional undergrounding along Jurupa Avenue.

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Appendix A Project Maps

- Map 1: Aerial Photo Base Map
- Map 2: Land Use
- Map 3: Land Use Sensitivity
- Map 4: Cultural Resources Sensitivity
- Map 5: Biological Resources
- Map 6: Biological Resources Sensitivity
- Map 7: Water Resources
- Map 8: Water Resources Sensitivity
- Map 9: Geohazards
- Map 10: Geohazards Sensitivity
- Map 11: Composite Environmental Sensitivity
- Map 12: Alternative Routes and Corridors

Appendix 2

Constructability Report, April 28, 2008

CONSTRUCTABILITY REPORT

Rev 1

April 28, 2008

Riverside Public Utilities – Riverside Transmission Reliability Project (RPU-RTRP)

James Day
TDBU
PAX 28983

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TABLE OF CONTENTS

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RPU- RTRP Constructability Considerations Report

EXECUTIVE SUMMARY

At the request of Riverside Public Utilities (RPU), multiple alternate routes were identified and evaluated by SCE Engineers for the Riverside Public Utilities – Riverside Transmission Reliability Project (RPU-RTRP). These were in addition to the original route along Van Buren discussed in Section E.

This report contains the results of these route investigations relative to potential constructability issues that may result during construction of these routes.

Four potential alternate routes were identified. These are referred to in this report as:

Van Buren Offset route	Reference: Report Section A and Appendix A
Bain Street route	Reference: Report Section B and Appendix B
West Route – Paralleling I15	Reference: Report Section C and Appendix C
East route	Reference: Report Section D and Appendix D

Results

Van Buren Offset Route

The Van Buren Offset route was found to have the greatest physical impact on developed, privately own properties. Numerous residential and commercial properties were impacted including at least one church property. A critical choke point exists at the Orco Block complex requiring poles to be located on their property. Construction of this route will be more complex as a result of numerous turns in the route and multiple crossings of both railroad right-of-way and Van Buren blvd.

Bain Street Route

The Bain Street route was found to have the least physical impact on developed, privately owned properties. The design and construction of this route was determined to be straight forward using conventional steel pole structures. A few poles were required to be located on privately owned ‘green-belt’ areas and a behind a parking lot.

West Route – Paralleling I15

The West route was found to have limited physical impact on developed, privately owned properties. However, this route has potentially significant impact on future development of private properties particularly for the segment of this route paralleling the I15. In addition, this segment contains a choke point at the shopping center at Limonite Ave. At this location, some poles must be located in the existing parking lot. This will result in displacing parking spaces in a parking lot already lacking sufficient parking reserves.

East Route

The East route requires poles to be placed in the Santa Ana River area flood plain. Based upon prior SCE experience in similar conditions, this route was determined to be non-constructible per SCE standards.

PROJECT BACKGROUND

In November 2004, the RPU Board authorized RPU to enter an agreement with Southern California Edison (SCE) for completion of a System Impact Study and a Facilities Study. The results of these studies were submitted to RPU in June and October of 2005, and indicated the need for construction of a double-circuited 230 kV transmission line in the City of Riverside, as well as a 230-69 kV substation.

The System Impact Study identified the existing SCE Mira Loma-Vista 230 kV transmission line (Mira Loma-Vista #1) as the tap point for interconnecting the proposed new substation to the existing SCE electrical grid. This new substation site is located near the northeast corner of Wilderness Avenue and Ed Perkic Street.

RPU retained POWER Engineers, Inc. (POWER) to complete the RTRP Feasibility Study and assist RPU to identify transmission line routes for RTRP. Eventually RPU identified their environmentally preferred route along Van Buren Blvd on Union Pacific Railroad Right-of-Way.

In 2007, RPU requested SCE to provide additional alternate routes to the aforementioned Van Buren Blvd route. Four potential additional routes were identified. These are referred to in this report as: (1) Van Buren Offset route , (2) Bain Street route , (3) West Route – Paralleling I15, and (4) East route.

METHODOLOGY

In order to identify alternate routes, numerous support activities were required. Initially, detailed reviews of aerial survey data and numerous trial and error transmission line right of way routings were performed. However, due to the dynamically changing nature of this region of Riverside County, numerous field-surveys and field walk-downs were also required to confirm the current status of development of the land and the feasibility of the proposed routes. Once a candidate route was identified, a significant effort was next required to determine land use data particularly related to land use restrictions, land ownership, future land use and land development plans. This involved numerous investigations with City, County, State and Federal representatives and agencies.

Once all the related data was compiled for the candidate transmission line locations, a minimum impact solution was selected for the each of the four routes. This report compares these solutions for each of these routes from the perspective of construction related issues.

SECTION A

VAN BUREN OFFSET ROUTE

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Van Buren Offset Route – Northernmost Section From Pomona Freeway to Bain Street

Description

The Van Buren offset route essentially parallels Van Buren Blvd. and extends in a southerly direction from the Pomona freeway to past Limonite, crossing the Santa Ana river, and bearing eastward toward the proposed new substation at Wilderness Ave. A graphical summary of field observations and related constructability concerns is contained in Appendix A. Excerpts of Appendix A are provided in the following Figures of this report with additional narrative and pictures for clarification.

The upper portion of this route begins at the tie-in to the Mira Loma 220 kV transmission line, north of the Pomona Freeway and extends south and southeast toward Bain Street as shown in Figure 1A.

Figure 1A – Northernmost segment of the Van Buren Offset route.

Future Planned Development

Identified in the upper left corner of Figure 1A is an apparent 'green-belt' labeled '1'. It is adjacent to the location of the tie-in to the existing 220 kV line going to the Mira Loma substation. This designation Item 1 indicates that during investigations, it was determined that the apparently open area shown has already been planned for future development. Figure 2A is a field photo of this area. As a result of this planned development, the construction of the tie-in to the 220 kV line was pushed east alongside the existing flood control channel. This flood control is in the distance and not visible from the angle at which this photograph was taken. It is noted that all the pictures in Section A were taken in the September and October 2007 timeframe.

Figure 2A – This Shows a View of the Existing 220 kV Line From Mira Loma Near The Tie-In For RPU-RTRP. The Actual Tie-in Is Toward The Distant Tower in the Center of the Picture. The Area In The Foreground Has Been Planned For Future Development

Pomona Freeway Crossing

The line continues south along the west side of the flood control channel and spans across the Pomona freeway at the location labeled ‘2’. The design of this freeway crossing will be in accordance with the requirements of current standards. This crossing will require suitably higher steel support structures to provide required clearances than the support structures in other portions of the line, but otherwise should be a straight forward design.

Figure 3A is a field photo taken from the approximate location of the support tower at the Pomona Freeway crossing looking across the Pomona freeway and toward the 220 kV line from Mira Loma substation. The new line runs parallel to the existing flood control which is slightly east of where this picture was taken. As a result, the flood control channel is not visible. The temporary concrete and plywood barricades on the Pomona freeway are apparent in the foreground.

Figure 3A– This Photograph Is Looking North Across The Pomona Freeway Toward The Tie-in Location With the 220 kV Mira Loma Line, From The Approximate Location Of The Support Structure Adjacent To The Pomona Freeway Crossing

Support Structures in Private Property Parking Lots & Flood Control Crossings

The supporting structure will be founded on private property and is labeled ‘4’ in Figure 1A. From this point, the line continues south and crosses the flood control channel at the locations labeled ‘3’ in Figure 1A. The transmission structures will be located off the Flood Control Right of Way (ROW) and provide adequate clearance for Flood Control Maintenance and related activities. The three locations in this area where structures will be needed were spotted on currently open land except at one location. This location will require spotting the structure in or adjacent to a warehouse parking lot. Closer inspection of the warehouse area indicated that locating a pole structure in this area is feasible.

Saint Sevaine Way to Bain Street

The proposed transmission line will cross Saint Sevaine Way toward Bain Street approximately paralleling the Flood Control channel on the east side. This area is currently undeveloped and open. Figure 4A shows an approximate location for a support structure at the point of crossing Saint Sevaine.

Figure 4A – This Picture Shows The Approximate Structure Location In The Green Belt Before Crossing Saint Sevaine Street

Figure 5A shows the open area east of the Flood Control Channel through which the proposed Transmission Line will be routed toward Main Street. This segment will pass slightly west of the Bain Street Substation. Portions of this route will cross leased areas presently used for temporary parking of vehicles. The proposed 220 kV Transmission Line will cross an existing transmission line as it approaches Bain Street. Some modifications to this existing line will be required.

Figure 5A – This Picture Shows The Open Area East of the Flood Control Toward Bain Street After the Saint Sevaine Street Crossing. An Existing Transmission Line Is Visible in the Distance Which Will Require Some Modifications.

Van Buren Offset Route – Bain Street To Orco Block Complex

Description
The following describes the routing of the proposed Transmission Line from Bain Street south to and around the Orco Block complex.

Figure 6A graphically portrays this area. This portion contains three items of concern identified as 6, 7 & 8 in Figure 6A.

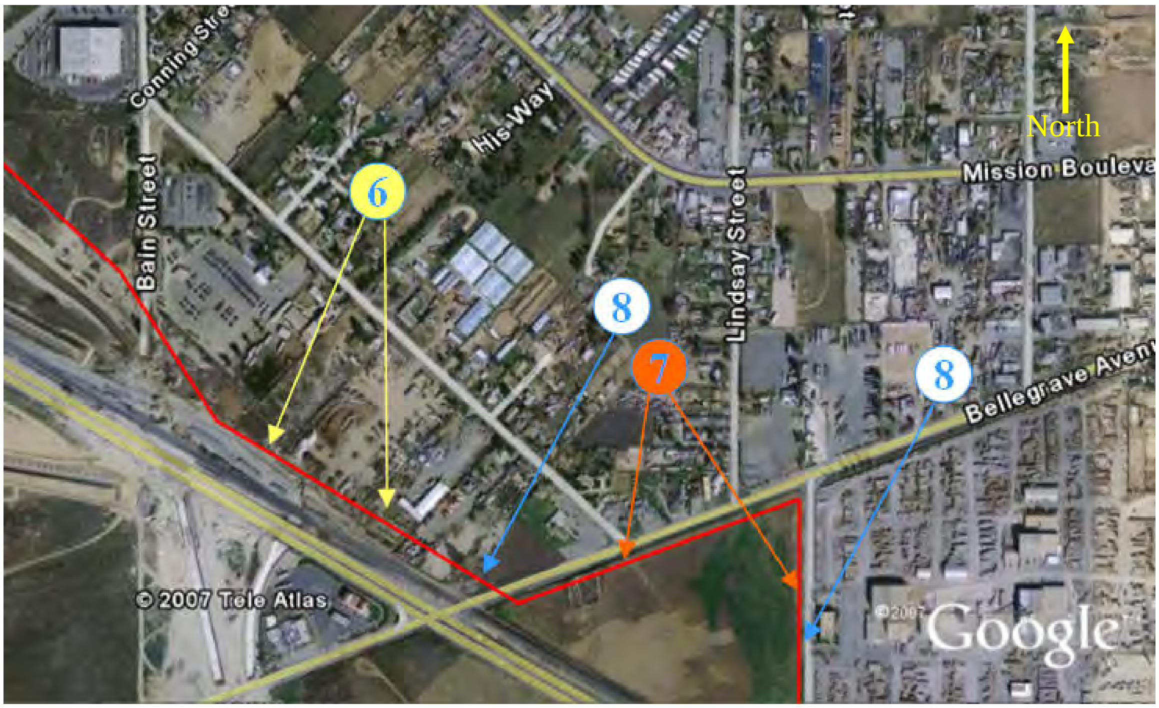

Figure 6A – Proposed Van Buren Offset route from Bain Street to the Orco Block Complex..

Private Land Takes and Transmission Line Crossing
Identified in Figure 6A are locations where private land takes are necessary. These are shown in Figure 6A as point 6. Improvements on these properties typically consist of single story metal warehouse type structures, some of which will likely be impacted by the proposed Transmission Line location. In this area, the proposed line is paralleling the Union Pacific railroad and the centerline of the proposed Transmission Line was located 150 feet from the edge of the railroad ROW. This spacing is consistent with current SCE standards. Point 8 shows the existing 66 kV line that also needs to be crossed.

Figure 7A shows a photograph of this area taken from Bellegrave Avenue looking west. Property improvements on the private property that will be impacted and the transmission lines that must be crossed are apparent in the photograph.

Figure 7A – This Photograph Was Taken Looking West From Bellegrave Avenue Toward The Location of The Proposed Transmission Line. This Section Parallels The UP ROW. In The Center Of The Picture Are Seen Improvements On The Private Property That Will Be Impacted By The Proposed Transmission Line. The 66 kV Transmission Line That Will Be Crossed is Also Apparent in the Photograph.

ORCO Block Complex

On the proposed Van Buren Offset route, the largest potential choke point is at the ORCO Block Complex. This is identified as point 7 in Figure 6A. To maintain adequate clearance from the UP ROW and avoid cutting directly through new Orco manufacturing buildings, the transmission line must be routed around the ORCO complex. Continuing the run of the proposed transmission line parallel to the UP ROW would route the line directly through two new ORCO processing facilities that are located adjacent to UP ROW. Figure 8A is a photograph showing the northernmost new ORCO processing facility under construction.

Routing around the ORCO Complex will require locating the transmission support structures in the greenbelt strips adjacent to the ORCO property and Bellegrave, Rutile and Galena streets. Photographs in Figures 9A, 10A and 11A show these locations.

Figure 8A – This Photograph Shows The Northernmost New Processing Facility on The ORCO Block Complex.

Figure 9A – This Picture Was Taken Looking Northeast on Bellegrave. The ORCO Block Property Is Shown On The Right Side of the Picture. The Proposed Location of the proposed Transmission Line Structures Is On The Future Greenbelt of The ORCO Block Property Adjacent to Bellegrave.

Figure 10A - This Picture Was Taken Looking South on Rutile Street. The ORCO Block Property Is Shown On The Right Side of the Picture. The Proposed Location of the proposed Transmission Line Structure Is On The Future Greenbelt (Center of Picture) on ORCO Block Property Adjacent to Rutile. The Line Will Route To Galena Which is 0.5 Miles South of Where This Picture Was Taken. The Line Will Cross Over Rutile and Continue West on Galena. Figure 11A Shows This Location on Galena. The Distribution Line Shown Will Be Required To Be Relocated.

Figure 11A – This Picture Was Taken Looking Northwest on Galena Street. The ORCO Block Property Is Shown On The Right Side of the Picture. The Proposed Location of the Transmission Line Structures Is On The Existing Greenbelt or Inside the ORCO Block Property Adjacent to Rutile. For Either Location, Operations Within The ORCO Complex Will Be Impacted and Will Require Significant Cooperation With The ORCO Company. The Existing Distribution Lines Will Need To Be Relocated.

Van Buren Offset Route – Orco Block Complex to Felspar and Jurupa Road

Description
The following describes the routing of the proposed Transmission Line from the Orco Block complex to Felspar and Jurupa Roads.

Figure 12A graphically portrays this area. This portion contains three items of concern identified as 6, 9 & 10 in Figure 12A.

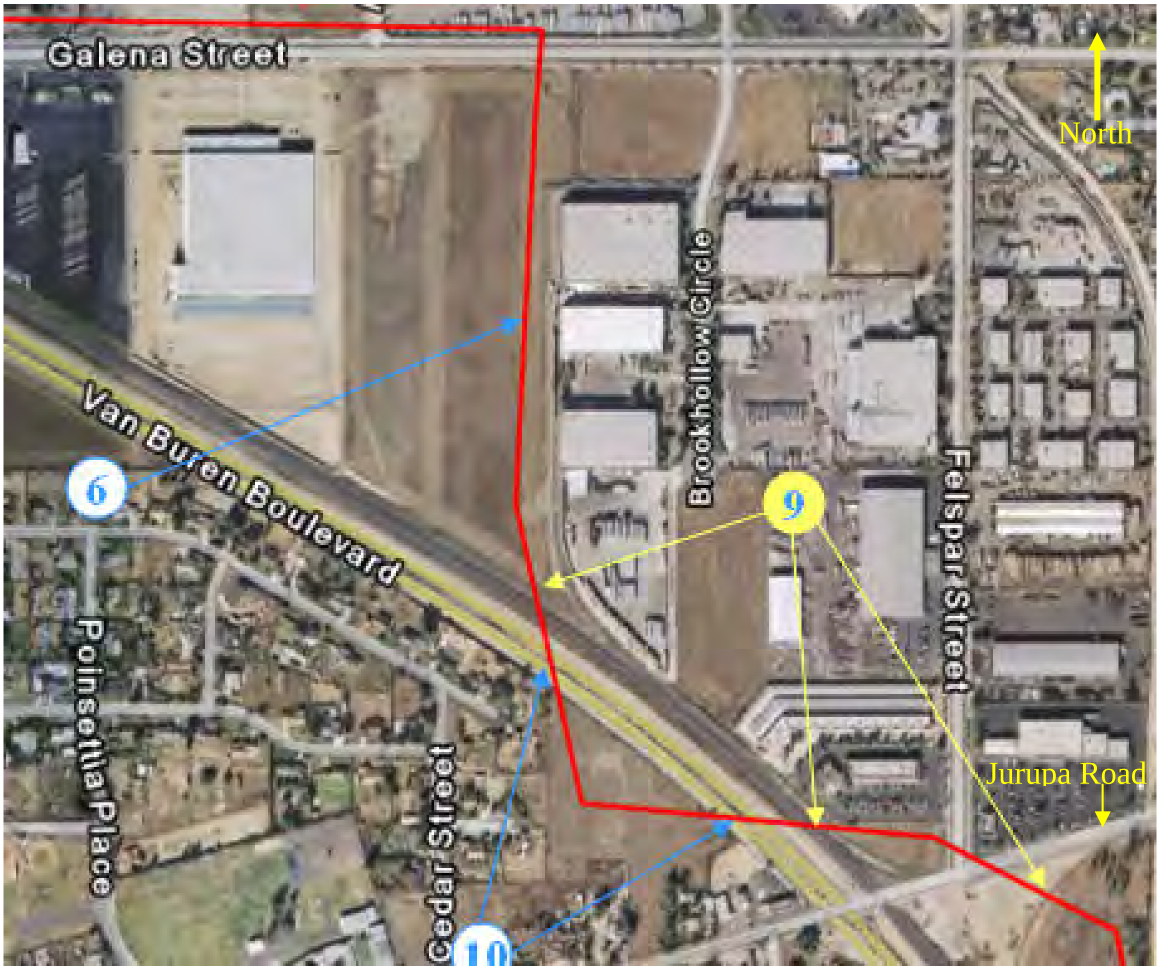

Figure 12A – Proposed Van Buren Offset route from the Orco Block Complex to Felspar and Jurupa Roads.

Private Land Takes
Identified in Figure 12A are locations where private land (future development) takes are necessary and are indicated as point 6. The proposed route continues west on Galena Street from the Orco property (see Figure 11A) and turns south onto private property as shown in Figure 12A. This land is currently under development. Improvements made so far include the installation of main sewer lines and laterals and staking for street construction. Figure 13A includes a photograph of this area.

Figure 13A – This Photograph Was Taken From A Location On Private Property Identified in Figure 12A Near The UP ROW Looking North Toward Galena Street. The Proposed Transmission Line Will Run Parallel To The Existing Commercial Facilities and Side-rail Spurs. The Civil Improvements On The Private Property Are Not Readily Apparent In This Photo.

Union Pacific Right of Way and Van Buren Street Crossings

In Figure 12A it can be seen that the proposed Transmission Line crosses the main UP rail line and Van Buren streets twice and a secondary UP spur (Jurupa Road) once. These crossings are identified in Figure 12A as points 9 and 10. The area of the first crossing is shown in Figure 14A.

The potential location of the tower across Van Buren Blvd. was spotted on undeveloped land. Figure 15A contains a photograph of this open, undeveloped area. The proposed location is set back from Van Buren Blvd. sufficiently to accommodate widening of Van Buren in the future.

From the area illustrated in Figure 15A, the proposed transmission line spans to the location shown in Figure 16A. It crosses the UP ROW and Van Buren Blvd. the second time in this span. The location shown in Figure 15A is located on private property. This property is seasonally used for selling holiday-related items.

Jurupa Road Crossings

From the support tower located in Figure 16A, the proposed Transmission Line spans southeast across Jurupa Road. The next support tower is proposed to be located adjacent to a green-belt of trees on private property. This location is shown in Figure 17A. In this crossing of Jurupa Road, a secondary UP rail spur is crossed as well as existing distribution and transmission lines. These lines will be required to be reworked.

Figure 14A – This Photograph Was Taken Looking South Showing The First Crossing of the Union Pacific Main Rail-line and Van Buren Blvd. In The Foreground Of This Picture is Approximately Where a Transmission Support Structure Will Be Located. The Background of This Picture Shows An Open Area Across Van Buren Street Where Another Structure Will Be Located.

Figure 15A - This Picture Was Taken Looking In a Northerly Direction Toward The Location Where Figure 14A Was Taken. The Center of the Pictures Is Approximately The Location Where The First Crossing of the UP ROW and Van Buren Street Is proposed. The Transmission Support Tower Would Be Located In The Undeveloped Area In The Left of This Photograph, Sufficiently Set Back From Van Buren street.

Figure 16A – This Picture Was Taken Looking West Toward The Transmission Support Structure Located Across Van Buren Blvd At The Approximate Location Shown in Figure 15A. The Proposed Transmission Line Will Span From That Tower To The Next Support Tower. This ‘Next’ Tower Will Be Located Approximately In The Bottom Left Of This Picture.

Figure 17A – This Picture Was Taken Looking Southeast To An Area Across Jurupa Road From The Area Where The Photograph in Figure 15A Was Taken. The Proposed Transmission Line Would Span From The Tower Located In Figure 15A to The Next Tower Located Adjacent To The Green-belt Tree Area Shown Slightly To The Left Of The Center of This Figure. This proposed Span Would Cross Jurupa Road and a Secondary UP Rail Spur. Existing Distribution Lines and Transmission Lines Would Need To Be Reworked.

Van Buren Offset Route – Felspar & Jurupa Roads to Limonite & Pedley Roads

Description
The following describes the routing of the proposed Transmission Line from just south of the Felspar and Jurupa Road area to slightly north of Limonite and Pedley Road.

Figure 18A graphically portrays this area. This portion contains two items of concern identified as 4 & 6 in Figure 18A.

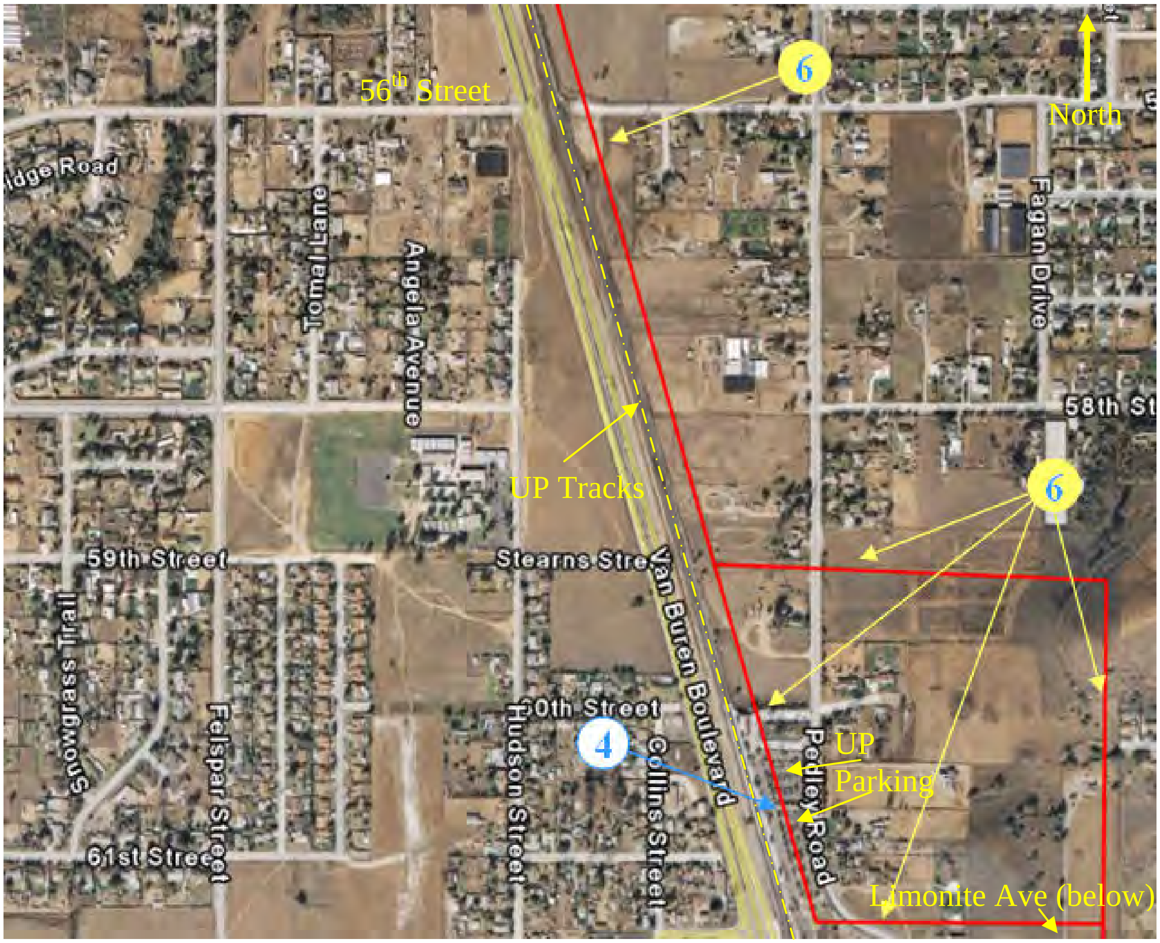

Figure 18A – Proposed Van Buren Offset Route From Just South of The Felspar and Jurupa Road area to Slightly North of Limonite and Pedley Road.

Private Land Takes – Southerly Routing
Identified in Figure 18A are locations where private land takes are necessary and are indicated as point 6. The proposed route parallels the UP ROW and the centerline is approximately 150 feet from the edge of the UP ROW as shown in Figure 18A.

In the portion of the proposed route segment shown at the top of Figure 18A, some private land takes are necessary. Figures 19A through 20A show private properties ‘takes’ in this area.

South of this, in general, the private properties adjoin the east side of the UP ROW and the improvements are limited typically to occasional out-structures or similar temporary facilities. At least one dwelling, however, located in the area just north of the railroad parking lot will be impacted by the Transmission Line. Figures 21A through 24A show private properties takes north and south of Avenue 56 at the UP ROW.

The referenced parking lot is shown in Figure 18A at the area where Pedley Road curves east to intersect Limonite. In this area, Transmission support structures will be placed in this existing parking lot. This is indicated in Figure 18A as point 4. Observations made in the field indicated that the parking lot would likely accommodate the placement of two tubular pole structures without significant impact. Some accommodations for the displaced parking would be required.

Figure 19A – This Photograph Was Taken From A Location South of Jurupa Road Looking North Toward Jurupa Road. The Proposed Transmission Line Will Run East Of (right hand side of picture) and Parallel To The Existing UP ROW. South of Jurupa Road Portions of The Land Are For Sale. Currently These Portions Appear To Be Used For Raising Small Livestock.

Figure 20A – This Photograph Was Taken Further South From Figure 19A Looking East. The Proposed Transmission Line Would Be Located East of the UP ROW (UP Rail Is In The Center of the Picture). The Land East of the UP ROW Intermittently Contained Out-Structures and Similar Temporary Facilities and Is Used For Raising Livestock.

Figure 21A – This Photograph Was Taken About 2 Miles South From Where Figure 20A Was Taken And Is Looking North. The Proposed Transmission Line Would Be Located East (Right) of the UP ROW (UP ROW Is In The Center of the Picture). The Land East of the UP ROW In This Area Is Undeveloped The Transmission Line Crossing Will Be Accommodated in The Design.

Figure 22A – This Photograph Was Taken Further South From Figure 21A Looking North. The Proposed Transmission Line Would Be Located East of the UP ROW (right-hand side of picture). The Land East of the UP ROW Intermittently Contained Out-Structures and Similar Temporary Facilities and Is Used For Raising Livestock As Is Apparent In This Picture.

Figure 23A – This Photograph Was Taken Further South From Figure 22A Looking East. The Proposed Transmission Line Would Be Located In The Center Of This Picture Impacting The Temporary Facilities and Potentially a Residential Structure (the roof of the residential structure is partially visible in the middle, right-hand side of the picture).

Figure 24A – This Photograph Was Taken Further South From Figure 23A Looking South. The Proposed Transmission Line Would Be Located East of the UP ROW (left-hand side of the picture). The Land East of the UP ROW Intermittently Contained Out-Structures and Similar Temporary Facilities and Is Used For Raising Livestock. In Greenbelt Area in the Distance Contains a Residential Structure and the Railroad Parking Lot.

Once the proposed Transmission Line passes through the parking lot, it bears east about a mile through privately owned open land, and then turns south to Limonite.

Continued Southerly Routing Past Railroad Parking Lot Rejected
Investigations into continuing the southerly routing of the proposed Transmission Line past the parking lot area discovered that numerous private/commercial properties would be impacted. This included private dwellings, commercial properties and church buildings. Figures 25A & 26A show some commercial structures impacted by this; Figure 27A shows an impacted residential structure; and Figure 28A shows an impacted church structure. As a result, this southerly routing beyond the railroad parking lot was rejected and the proposed line was instead routed in an easterly direction.

Figure 25A – This Photograph Shows A Small Commercial Structure Impacted By Continuing The Proposed Transmission Line Adjacent to the UP ROW And South of the Railroad Parking Lot

Figure 26A – This Photograph Shows A Private and Commercial Structure (in the Distance) Impacted By Continuing The Proposed Transmission Line Adjacent to the UP ROW And South of the Railroad Parking Lot

Figure 27A – The Right Hand Side of This Photograph Shows A Residential Structure Impacted By Continuing The Proposed Transmission Line Adjacent to the UP ROW And South of the Railroad Parking Lot

Figure 28A –This Photograph Shows A Church Structure Impacted By Continuing The Proposed Transmission Line Adjacent to the UP ROW And South of the Railroad Parking Lot

Private Land Takes – Alternate Easterly Routing Around Existing Dwellings and Parking Area

Identified approximately in the middle of Figure 18A is an eastern alternate to the southern routing of the proposed Transmission line. To avoid impacting residential structures and the railroad parking lot, the alternate routing turns ninety degrees, bearing east. After a little more than a mile, the route then turns back to a southerly direction toward Limonite. Presently, this land was observed to be open and undeveloped with portions for sale. This alternate routing would avoid displacing existing residential structures north of the parking lot, as well as avoiding disturbing the parking lot. In addition, this would avoid continuing the southerly routing of the Transmission line past Limonite.

Planned Future Developments – Alternate Easterly Routing

Further investigations into this 'presently' open land determined that in fact numerous plans for developing these areas have been made. This easterly alternate routing would extend through a number of proposed future developments for senior citizen housing, private dwellings and commercial property developments.

Van Buren Offset Route – Limonite and Pedley Road To New Substation At Wilderness Avenue

Description
The following describes the routing of the proposed Transmission Line from the Limonite and Pedley Road area to the location of the new substation at the north end of Wilderness Avenue.

Figure 29A graphically portrays this area. This portion contains numerous items of concern identified as 4, 6, 11, and 12 through 16.

East and West Routes Extending From Limonite To The Span Across The Union Pacific Right Of Way and Van Buren Blvd
Two potential routes south from Limonite are shown. These two routes converge upon crossing the Union Pacific Railroad at Van Buren Blvd. This point of convergence is located behind the future site for an animal shelter facility. This is identified as point 14 in Figure 29A. The proposed line is routed west of this facility and east of the residential structures.

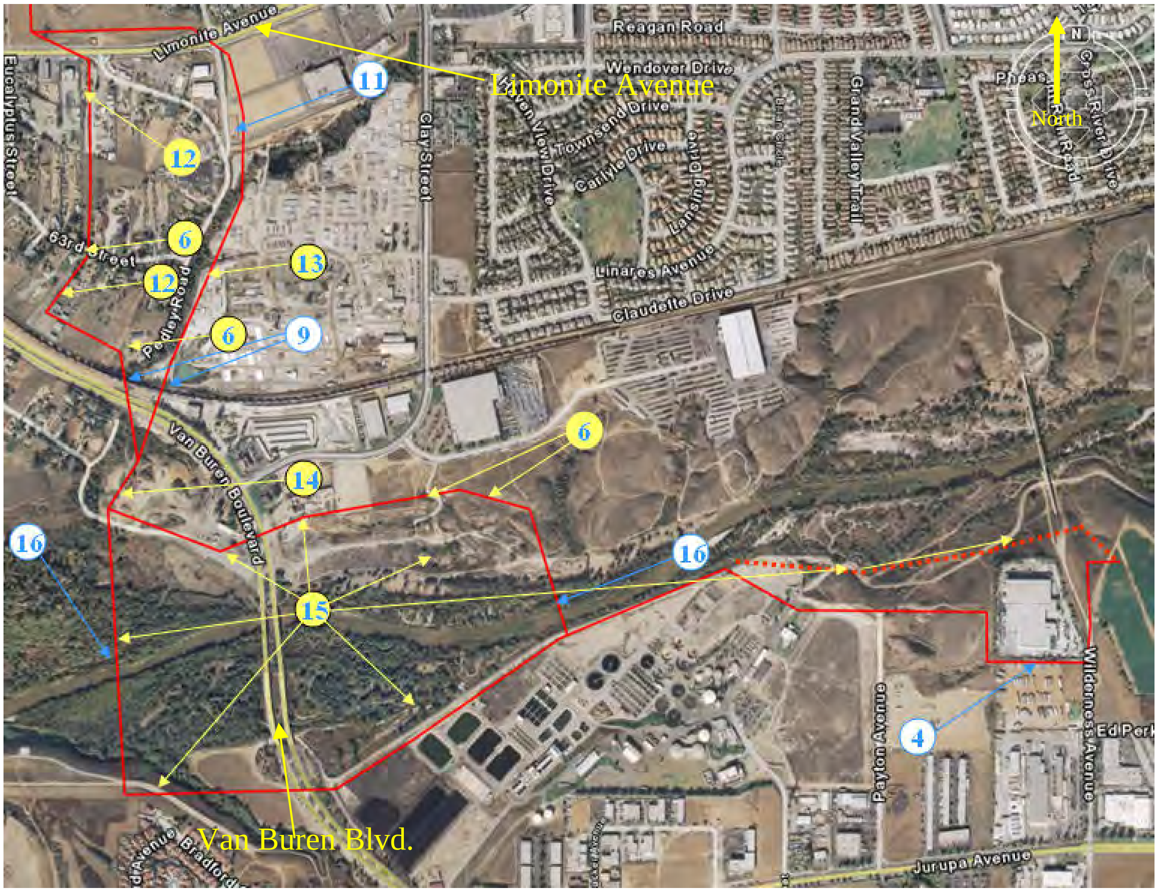

Figure 29A – Proposed Van Buren Offset Route From The Limonite and Pedley Road Area To The New Substation At Wilderness Avenue.

Private Land Takes – West Route South From Limonite To 63rd Street And On To The Animal Shelter Area South of Limonite

The west route extending south from Limonite to 63rd street passes through commercial property identified as point 12 in Figure 29A. Figure 30A shows the commercial property impacted looking north from 63rd street. The impacted commercial property is in the distance. Figure 31A shows a zoom-in of this view.

Figure 30A – This Photograph Was Taken From 63rd Street Looking North At The Impacted Commercial Property. The Proposed Transmission Line Is Routed Through The Commercial Property in The Distance And Through This Open Area.

Figure 31A – This Photograph Is A Zoom-in Of Figure 30. The Impacted Commercial Property Storage Area Is Visible In The Center of the Picture.

Once the west route crosses 63rd street, it continues southwest through residential/commercial property toward the Union Pacific ROW. Figure 32A shows the residential and commercial structures impacted by extended the route in this area.

Figure 32A – This Photograph Shows The Residential/Commercial Structures Impacted By Continuing The Proposed Transmission Line Across 63rd Street Toward The Union Pacific ROW.

Once the line approaches the Union Pacific ROW, it turns easterly and passes through residential properties. The sections of these properties are open, except for the location at which the line spans over the UP ROW and Van Buren street (point 9 in Figure 29A). At this point, a residential structure is impacted (point 6 in Figure 29A). The line spans across the Union Pacific ROW and Van Buren Blvd. to a location west of the new animal shelter compound (point 14 in Figure 29A). Conventional support structures designs and spans are expected for this crossing.

Private Land Takes – East Route South From Limonite, Parallel To Pedley Road And On To The Animal Shelter Area South of Limonite

The east route extending south from Limonite passes parallel to Pedley Road, crossing the northwest corner of a shopping center complex and across Gas Company lines. This is indicated as point 11 in Figure 29A. The corner of the shopping center complex is presently undeveloped but future development is planned. Figure 33A shows gas company valving in this area.

The line continues southward through a site that was previously used to manufacture pipe products. This site is shown in Figures 34A and 35A. There is some environmental concern for spotting support structures in this open property.

Figure 33A – This Photograph Shows Gas Company Valving In The Area Of The West Route From Limonite South Toward Van Buren Street.

The line continues southward toward the southwest corner of the prior pipe manufacturing property. From there it spans across the Union Pacific ROW and Van Buren Blvd. to a location west of the new animal shelter compound (point 14 in Figure 29A). This is the same location as that for the west route. Conventional tower support structures designs and spans are anticipated for this crossing.

Figure 34A – This Photograph Shows A Stake Identifying The Location Of A Gas Line in The Foreground, and The Former Site of the Pipe Manufacturing Company In The Left Middle Of The Figure. Pedley Road Is Visible On The Right Side of The Figure. Figure 35A Shows A Zoom-in Of The Open Property On The Left. Some Environmental Concerns Exist For Using This Site.

Figure 35A – This Photograph Was Taken From Pedley Road Looking East Toward The Former Site of the Pipe Manufacturing Company. As Mentioned Previously, Some Environmental Concerns Exist For Using This Site.

Routing From The New Animal Shelter To The New Substation

From the new animal shelter, two routes were identified as possible routes to the new substation. These are shown in Figure 29A. In this area, each route crosses the Santa Ana River (indicated by point 16). The northern branch crosses Van Buren Blvd, and through private properties that are planned for future development (indicated by point 6 in Figure 29A) before crossing the river. The southern branch first crosses the river and then Van Buren Blvd. Eventually both branches run along the north boundary of the water treatment facilities. At the northeast corner of the water treatment facility, two additional route extensions to the future location of the proposed substation at Wilderness Avenue are indicated. The northern extension continues east along the Santa Ana River to the substation location. The other continues south of this, through a parking lot area, to Wilderness Avenue and north to the proposed substation.

Convention transmission structures designs and spans are expected for these routes. No particular technical issues are anticipated. However, some concerns exist regarding locating structures on Land/water conservancy sensitive areas. These areas are identified as point 15 in Figure 29A.

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SECTION B

BAIN STREET ROUTE

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RPU- RTRP Constructability Considerations Report

Bain Street Route – General Description – Overall Bain Street Route

The northern portion of the Bain Street route is essentially the same as that for the offset Van Buren route until the route reaches Bain Street. At that point, the route progresses south following Bain Street. It extends in a southerly direction past Limonite, and then proceeds in an easterly direction on the north side of the Santa Ana river area. As the route approaches the location where Van Buren crosses the Santa Ana River, the route has two potential branches. One branch proceeds south and crosses the Santa Ana River. Once it has crossed the Santa Ana river, it spans east across Van Buren Blvd. and continues east along the northern boundary of the water treatment facilities. For this area, the route continues east to the proposed new substation location following the same path as that for the Van Buren offset route.

The other branch remains north of the Santa Ana River, crosses Van Buren Blvd. continues a short distance east, and then proceeds across the Santa Ana River. At this point, the route spans across the Santa Ana River to a location north of the water treatment facilities. At this point, the route turns and continues east along the northern boundary of the water treatment facilities. For this area, the route also continues east to the proposed new substation location following the same path as that for the Van Buren offset route.

A graphical summary of field observations and related constructability concerns is contained in Appendix B. Excerpts of Appendix B are provided in the following Figures of this report with additional narrative and pictures for clarification. The pictures were taken during field walk-down surveys performed in September and October of 2007.

Bain Street Route – Northernmost Section From Pomona Freeway to Bain Street

The upper portion of the Bain Street route begins at the tie-in to the Mira Loma 220 kV transmission line, north of the Pomona Freeway and extends south and southeast toward Bain Street as shown in Figure 1B.

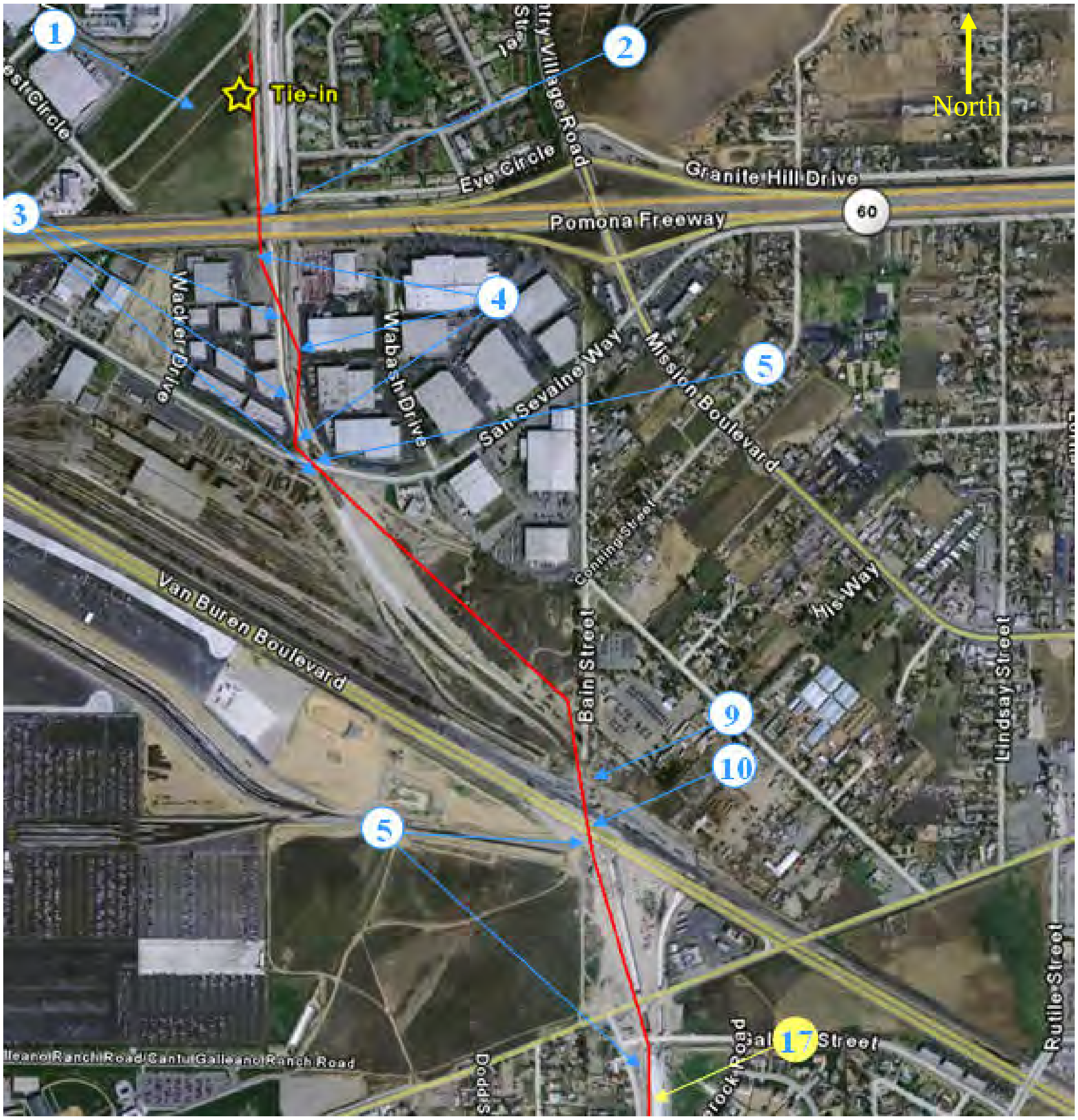

Figure 1B – Northernmost segment of the Bain route.

Future Planned Development

Identified in the upper left corner of Figure 1B is an apparent 'green-belt' labeled '1'. It is adjacent to the location of the tie-in to the existing 220 kV line going to the Mira Loma substation. This designation Item 1 indicates that during investigations, it was determined that the apparently open area shown has already been planned for future development. Figure 2B is a field photo of this area. As a result of this planned development, the construction of the tie-in to the 220 kV line was pushed east alongside the existing flood control channel. This flood control is in the distance and not visible from the angle at which this photograph was taken.

Figure 2B – This Shows a View of the Existing 220 kV Line From Mira Loma Near The Tie-In For RPU-RTRP. The Actual Tie-in Is Toward The Distant Tower in the Center of the Picture. The Area In The Foreground Has Been Planned For Future Development

Pomona Freeway Crossing

The line continues south along the west side of the flood control channel and spans across the Pomona freeway at the location labeled '2'. The design of this freeway crossing will be in accordance with the requirements of current standards. This crossing will require suitably higher steel support structures to provide required clearances than the support structures in other portions of the line, but otherwise should be a straight forward design.

Figure 3A is a field photo taken from the approximate location of the support tower at the Pomona Freeway crossing looking across the Pomona freeway and toward the 220 kV line from Mira Loma substation. The new line runs parallel to the existing flood control which is slightly east of where this picture was taken. As a result, the flood control channel is not visible. The temporary concrete and plywood barricades on the Pomona freeway are apparent in the foreground.

Figure 3B – This Photograph Is Looking North Across The Pomona Freeway Toward The Tie-in Location With the 220 kV Mira Loma Line From The Approximate Location Of The Support Tower Adjacent To The Pomona Freeway Crossing

Support Structures in Private Property Parking Lots & Flood Control Crossings
The supporting tower will be founded on private property and is labeled ‘4’ in Figure 1B. From this point, the line continues south and crosses the flood control channel at the locations labeled ‘3’ in Figure 1B. The transmission structures will be located off the Flood Control Right of Way (ROW) and provide adequate clearance for Flood Control Maintenance and related activities. The three locations in this area where structures will be needed were spotted on currently open land except at one location. This location will require spotting the structure in or adjacent to a warehouse parking lot. Closer inspection of the warehouse area indicated that locating a pole structure in this area is feasible.

Saint Sevaine Way to Bain Street North of Van Buren Blvd.
The proposed transmission line will cross Saint Sevaine Way toward Bain Street approximately paralleling the Flood Control channel on its east side. This area is currently undeveloped and open. Figure 4B shows an approximate location for a support structure at the point of crossing Saint Sevaine.

Figure 4B – This Picture Shows The Approximate Structure Location In The Green Belt Before Crossing Saint Sevaine Street

Figure 5B shows the open area east of the Flood Control Channel through which the proposed Transmission Line will be routed toward Main Street. This segment will pass slightly west of the Bain Street Substation. Portions of this route will cross leased areas presently used for temporary parking of vehicles. The proposed 220 kV Transmission Line will cross an existing 66 kV line as it approaches Bain Street. Modifications to the existing transmission line will likely be required at this crossing..

Figure 5B – This Picture Shows The Open Area East of the Flood Control Toward Bain Street After the Saint Sevaine Street Crossing. An Existing Transmission Line Is Visible in the Distance Which Will Require Some Modifications.

Bain Street North of Van Buren Blvd. to South of Van Buren Blvd.

The proposed route spans from north to south across Van Buren Blvd and continues south along the Riverside County Flood Control right-of-way. As indicated in Figure 1B, this crossing span will cross the Union Pacific ROW (indicated as point 9), Van Buren Blvd (indicated as point 10), and a gasline (indicated as point 5). Typical transmission line support structures and spans are anticipated for use in this area with corresponding care taken to provide for adequate gasline construction clearances.

Route Proceeding South Along Bain Street

The proposed route continues along Bain Street from the Bellegrave Avenue area to Limonite. As indicated in Figure 6A, there are three items of concern in this segment.

Riverside County Flood Control Right-of-Way

The first item of concern is the availability of the Riverside County Flood Control District property on Bain Street (designed as 17 in Figure 6B). The routing along Bain Street presumes this open land west of the flood control channel can be made available for use in routing this transmission line. A photograph shown in Figure 7B was taken along Bain Street and more clearly shows this open land.

This land belongs to the Riverside County Flood Control District and appears to be an extension to the typical Flood Channel area. Preliminary evaluations indicated that sufficient clearance for Flood Control maintenance activities can be included in the Transmission Line design without adversely impacting Flood Control maintenance operations. Land use evaluations and negotiations for this land are continuing.

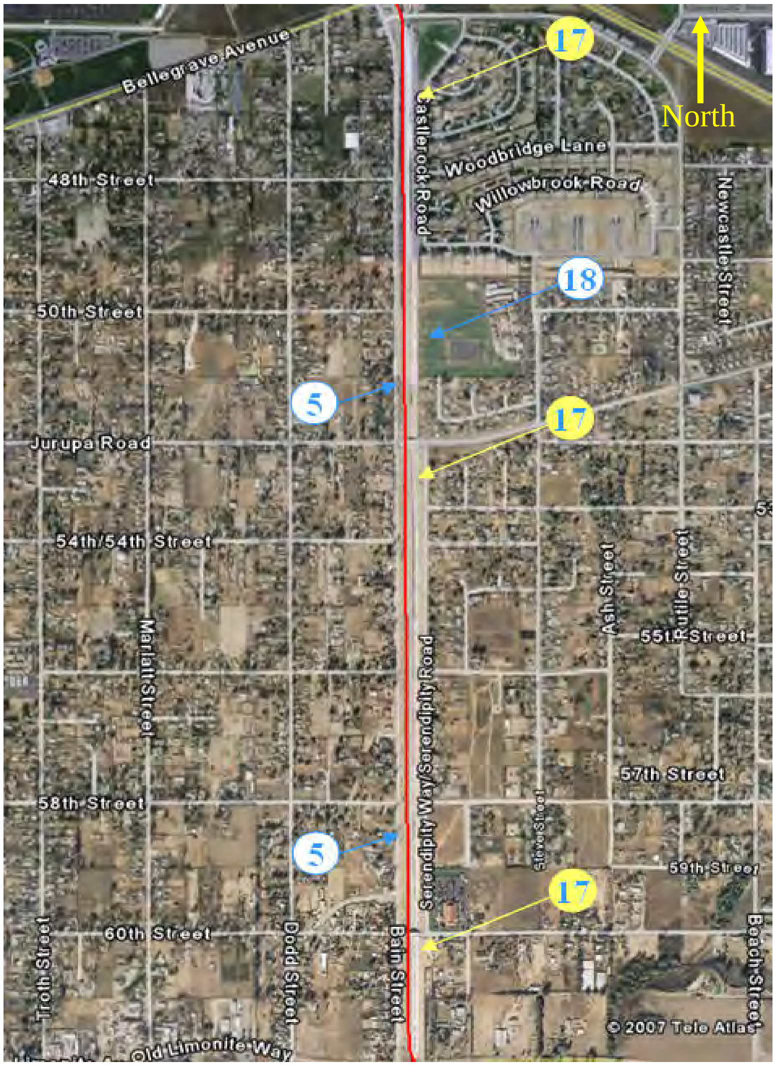

Figure 6B – This Picture Shows The Routing Along Bain Street Between Bellegrave Ave and Limonite.

Figure 7B – This Picture Is Looking North Along Bain Street (Bain Street Is On The Left Hand Side of The Picture). In The Foreground Is The Open Area Adjacent To The Flood Control (The Flood Control Channel Is The Fenced Area On The Right Hand Side Of The Picture). The Bain Street Route Will Extend Along The Open Area Parallel To Bain Street.

Gas Line Crossings and EMF Sensitive Area

Other items of interest along Bain Street include gas-line crossings (designated as 5 in Figure 6B) and an EMF Sensitive area (designated as 18 in Figure 6B). Gas-line crossing considerations are accommodated for in normal SCE Design and Construction practices.

The EMF Sensitive area requirements are a result of the proximity of school grounds to the transmission line right of way. Preliminary investigations have indicated that EMF risks can be satisfactorily mitigated in the Design of the Transmission line and supporting structures.

Bain Street South of Limonite – East Toward Van Buren Blvd.

Southern California Gas Company Facilities And Flood Control ROW
The proposed route spans across Limonite Avenue to an area just north of the Santa Ana river. To accomplish this, a Custody Transfer Valve (Pedley Fuel Gas pipeline) will need to be crossed, indicated as 5 in Figure 8B and shown in more detail in Figure 9B. Accommodations for this crossing will be made in the Transmission Line design and possible modifications in the transfer valve facilities. A distribution line along Limonite Avenue will also be modified as required to accommodate crossing requirements with the proposed transmission line.

Crossing of the Flood Control ROW (designated 17 in Figure 8B) will also be accommodated for in the Transmission Line design and construction.

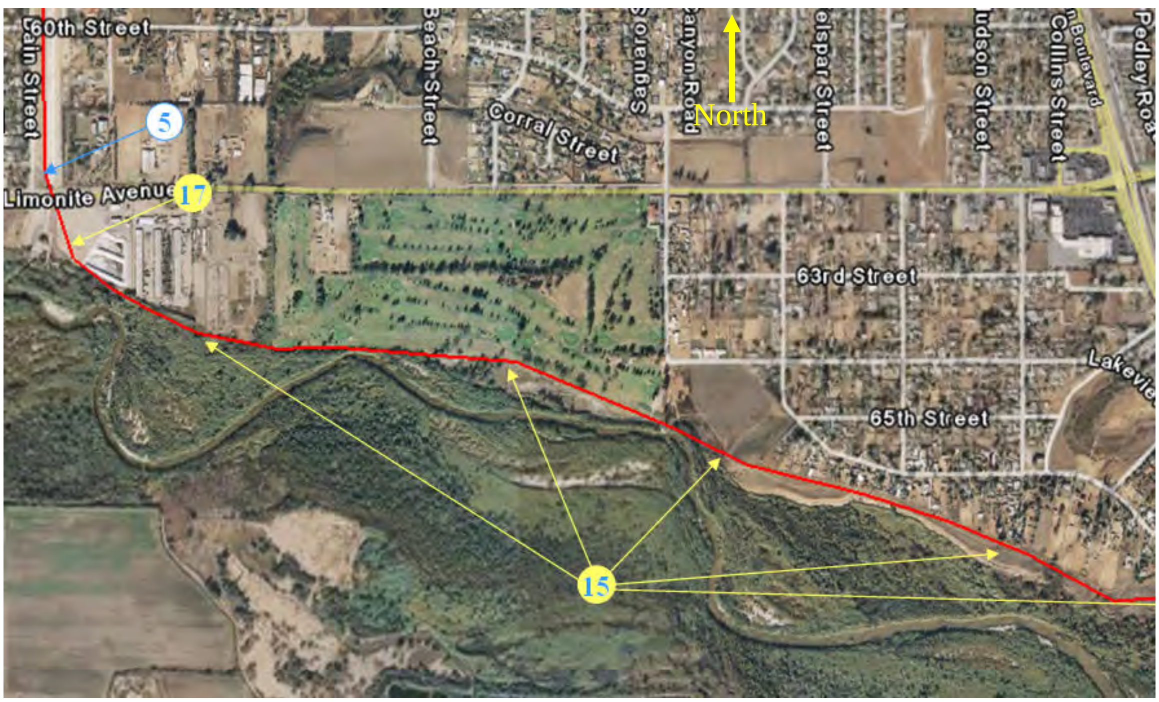

Figure 8B – This Figure Shows The Bain Route Crossing Limonite and Extending East On The North Side of The Santa Ana River Area Toward Van Buren Blvd

Figure 9B – This Photograph Is Looking South Toward Limonite Avenue and The Santa Ana River Area (in the background). It Shows A Gas Company Custody Transfer Valve (Pedley Fuel Gas Pipeline) on Limonite Avenue and Bain Street. Accommodations for Crossing This Will Need To Be Made. The Distribution Line (Visible In This Photo) Along Limonite Avenue Will Also Need To Be Modified To Accommodate For The Proposed Transmission Line.

East Routing Along North Side Of Santa Ana River Area Toward The New Animal Shelter Area At Van Buren Blvd

Once the line arrives at the north side of the Santa Ana River area, it extends in an easterly direction toward the new Animal Shelter compound at Van Buren Blvd. In Figure 8B, it can be seen that this route is adjacent to the Land/Water Conservancy sensitive area (designated as 15 in Figure 8B). To lessen this impact, the proposed line crosses onto the existing golf course property. The extent of this crossing will be minimized as much as possible. Figure 10B shows a typical southern portion of the golf course impacted. The proposed transmission line would be located adjacent to the reinforced embankment near the Santa Ana River.

Figure 10B – This Photograph Is Looking West Adjacent To The Santa Ana River area. The Santa Ana River Is On The Left Hand Side Of This Figure and The Golf Course Is Apparent On The Right Hand Side Of This Picture. The Proposed Transmission Line Would Extend East And West And Be Located On The Golf Course Adjacent To The Area of The Reinforced Embankment in The Center of The Picture.

Figure 11B – This Photograph Is Looking Southeast Toward The Santa Ana River Over The Santa Ana Regional Park Area. The Proposed Transmission Line Would Route In The Backside Of This Area, Staying North of The River And Extend To The Area Of The New Animal Shelter On Van Buren Blvd.

Routing From The New Animal Shelter To The New Substation

From the new Animal Shelter area (indicated as 14 in Figure 12B), two routes were identified as possible routes to the new substation. These are shown in Figure 12B. In this area, each route crosses the Santa Ana River (indicated by point 16). The northern branch crosses Van Buren Blvd, and through planned private properties (indicated by point 6 Figure 12B) before crossing the river. The southern branch first crosses the river and then Van Buren Blvd. Eventually both branches run along the north boundary of the water treatment facilities. At the northeast corner of the water treatment compound, two additional route extensions to the location of the future substation at Wilderness Avenue are indicated. The northern extension continues east along the Santa Ana River to the substation location. The other continues south of this, through a parking lot area, to Wilderness Avenue and north to the proposed substation.

Conventional transmission structures designs and spans are expected for these routes. No particular technical issues are anticipated. However, some concerns exist regarding locating structures on Land/water conservancy sensitive areas. These areas are identified as point 15 in Figure 12B.

Figure 12B – This Figure Shows The Potential Routing Of The Bain Street Alternative From The Area Of The New Animal Shelter At Van Buren Blvd. To The New Substation. Multiple Routings Are Possible In This Area, As Seen In The Figure.

Bain Street Alternate Route To The New Substation Area

As shown in Figure 8B, once the route south on Bain Street reaches the Santa Ana River, it turns east toward Van Buren Blvd. An alternate routing is available at this point. Instead of turning east, the route turns west and ultimately crosses the Santa Ana River as shown in Figure 13B and indicated as 16. At this point it converges with the West Route that parallels I15. The details of the West Route are contained in the following Section C.

The main items of concern in this alternate route are private property takes (indicated as 6 in Figure 13B) and potential interface land/water conservancy issues (indicated as 15 in Figure 13B).

There will also be some impact to the golf course on which a steel transmission support structure will be placed. This will support the span across the Santa Ana River. Conventional structural designs and conductor spans are anticipated for this span.

There will also be some crossings of lower voltage transmission lines and distribution lines in this alternate. Some modifications to these existing lines are anticipated.

Figure 13B – This Figure Shows An Alternate Route To The Proposed New Substation Location (indicated as a dotted blue line in the figure). From Bain Street, The Route Turns West And Goes Along Limonite. After Approximately 1 Mile It Turns Southwest, Passing Private Residential Structures, And Onto A Golf Course. At This Point It Spans Across The Santa Ana River and Merges With The West Route. More Details Of The West Route Are Contained In Section C.

SECTION C

WEST ROUTE
- Paralleling I15

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WEST Route – Paralleling I15

Description
The West Route extends essentially due west from the location of the proposed new substation at Wilderness Avenue and continues along the southern side of the Santa Ana River. It continues in this westerly direction until it approaches the I15 highway. At this point, the route turns north. It continues north paralleling the I15 until it reaches the tie-in point with the Mira Loma lines. A graphical summary of field observations and related constructability concerns is contained in Appendix C. Excerpts of Appendix C are provided in the following Figures of this report with additional narrative and pictures for clarification. The pictures contained in this section were taken in the October 2007 time frame.

Route Exiting The Area Of The Proposed Substation at Wilderness Avenue
Figure 1C shows the beginning portion of the West route. Two branches are possible out of the proposed substation. One is shown as a dotted red line in Figure 1C, and the other as a solid red line in Figure 1C. The first runs north and then west along the Santa Ana River. In crosses over an existing gas line in Figure 2C (shown as 11 in Figure 1C).

Figure 1C – Beginning Segment of the West Route Proceeding Out From The Proposed New Substation.

From that point the route continues west to an area at the northern edge of the water treatment facility. The second branch out of the new substation area proceeds first south along Wilderness Avenue, then west across a parking lot (indicated as 4 in Figure 1C). From there it also continues west until it reaches the same area at the northern edge of the water treatment facility. From here the route continues in a westerly direction crossing Van Buren Blvd.

Typical construction is anticipated in this area with the only items of significance being the crossing of the gas pipe line and the interface considerations with the Land/Water Conservancy Properties (indicated as 15 in Figure 1C).

Figure 2C – The Proposed New Transmission Line Will Cross This Existing Gas Line After Existing The New Substation And Turning West Toward I15. The Existing Distribution Line Will Also Be Modified As Required.

Potential Environmental Issues East of Van Buren Blvd

The route continues west across Van Buren Blvd into an open area indicated as 13 in Figure 1C. Investigations have determined that this open area may have some environmental clean-up issues associated with it. Foundation designs and line routing could be potentially impacted by these issues.

West Route Continuing Toward Pedley Substation

From this area west of Van Buren Blvd. , the proposed new line continues west toward Pedley substation following the existing La Sierra line. This is shown in Figure 3C. The La Sierra line was designed as a 66 kV line on a 40 foot wide right-of-way (ROW). It is currently operating at 12 kV.

Figure 3C – The Proposed New Transmission Line Will Approximately Parallel The Existing La Sierra Line In The Area Shown In This Figure.

The existing line route was investigated initially as a possible location for the proposed new 230 kV line. The ROW was determined to be too small to make it practicable to reuse for a 230 kV line. As a result, the new line is routed parallel to the existing La Sierra line but on new ROW (approximately 150 feet south of La Sierra).

Figure 4C shows a photograph of typical portion of the line this area.

Figure 4C – This Photo Was Taken Looking West Toward Pedley Substation. The Existing La Sierra Line Is Shown On The Right Hand Side of This Picture. The Proposed New Transmission Line Will Be Located Approximately In The Center Of This Picture And Running Toward Pedley Substation.

Typical transmission tower design and construction should be satisfactory for use in this area. The major item of concern is the potential interface with the Land/Water Conservancy Properties which will be minimized wherever possible.

Approaching Pedley Substation

As the proposed new line continues west toward Pedley substation, two options are possible approaching Pedley as shown in Figure 5C.

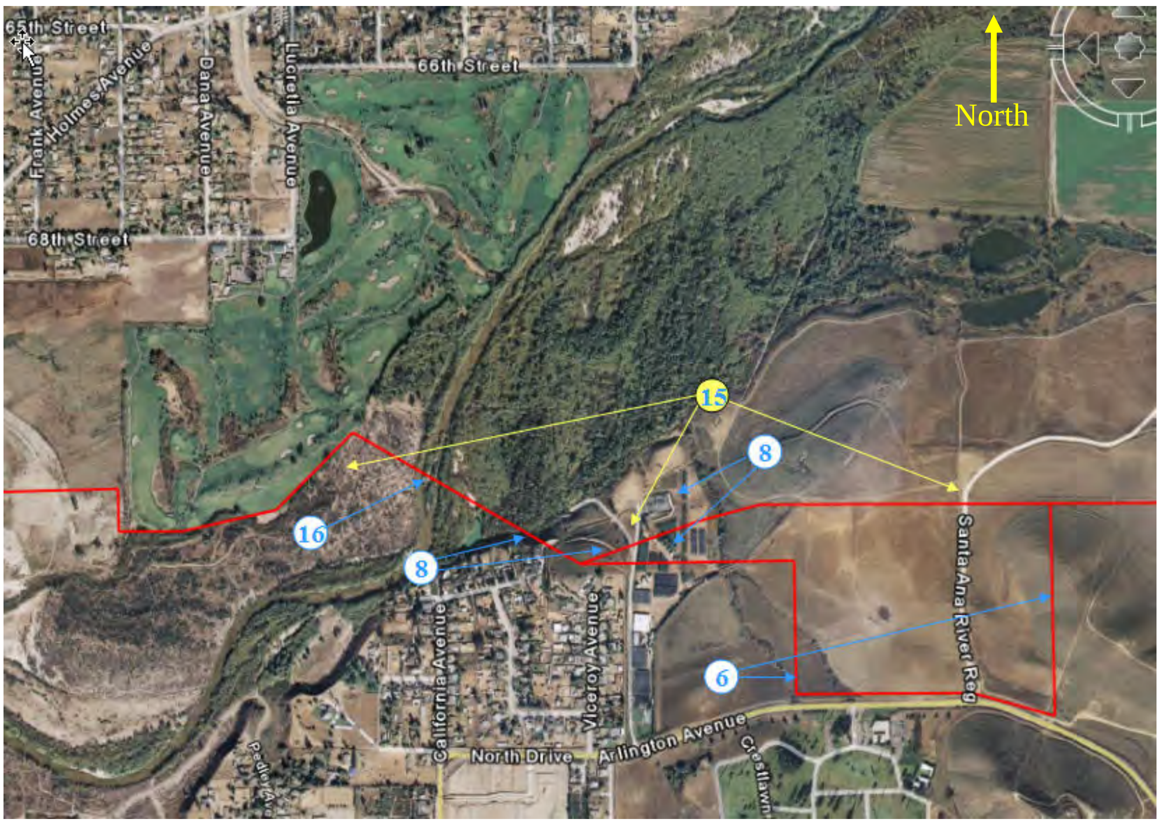

Figure 5C – Two Approaches To The Pedley Substation Are Possible.

On the right hand side of Figure 5C, the proposed route separates into two possible branches. The first continues along the southern side of the Santa Ana River area, proceeding directly into the Pedley area. The second branch turns south to and proceeds along Arlington Avenue a distance before turning back north. After proceeding north a distance, the route turns west and passes through the Pedley Substation area. This second branch configuration was included to lessen potential adverse impacts to future land-usage. This second branch will impact private land ownership and is indicated by 6 in Figure 5C.

Existing Transmission / Distribution Line Crossings in The Pedley Substation Area

Numerous existing power lines are located in the Pedley substation area. The routing of the proposed route will reduce some of these lines to be reworked and modified. These are indicated as 8 in Figure 5C. Figures 6C, through 9C and 10C show the area around Pedley and the various lines coming in and out of the substation that may be impacted by the proposed new line and require rework.

Figure 6C – This Picture Was Taken Northwest of Pedley Substation And Is Looking East (Pedley Substation Is Shown In The Right Hand Side of This Picture). Various Transmission / Distribution Lines Come Into And Out of Pedley Substation.

With the exception of the major span across the Santa Ana River, typical Transmission structure designs and conductor spans will be adequate for the proposed transmission line construction in this area. The major span across the Santa Ana River will require dead-end, latticed steel tower strain structures.

Figure 7C – This Picture Was Taken Northwest of Pedley Substation And Is Looking Southeast Toward Pedley Substation. Various Transmission / Distribution Lines That Come Into, Out-of And Around Pedley Sub Are Apparent in This Picture. The Proposed New Line Will Require Some of These Existing Lines To Be Reworked And Modified.

Figure 8C – This Picture Was Taken At The Southwest Corner of Pedley Substation And Is Looking South. Various Transmission / Distribution Lines That Come Into, Out-of And Around Pedley Sub Are Apparent in This Picture. The Proposed New Line Will Require These Existing Lines To Be Reworked And Modified.

Figure 9C – This Picture Was Taken Northwest of Pedley Substation And Is Looking Southwest. Various Transmission / Distribution Lines That Come Into, Out-of And Around Pedley Sub Are Apparent in This Picture. These Existing Lines Will Be Reworked And Modified. The Hill Shown In The Center Of The Picture Will Be The Location Of A Major Transmission Support Tower That Supports The South End Of The Span Across The Santa Ana River.

Figure 10C – This Picture Was Taken Northwest of Pedley Substation And Is Looking West. These Existing Lines Into And Around Pedley Substation Will Be Reworked And Modified To Accommodate The Proposed Transmission Line. The New Line Will Span Across The Lines Shown In This Figure, Across The Santa Ana River and Onto A Golf-Course Area North of The Santa Ana River (Shown in Figure 5C). The Santa Ana River Crossing is Indicated by 16 in Figure 5C.

Figure 11C – This Picture Was Taken West of Pedley Substation And Is Looking Northeast. The Proposed New Line Will Cross The Santa Ana River In This Area Between The Existing Lines. The New Line Will Span Across The River Onto An Area Adjacent To A Golf Course On The North Side Of The River. The Golf Course Is Slightly Visible In The Middle Left Hand Side Of This Picture.

North Of The Santa Ana River Adjacent To The Existing Golf Course

Once across the Santa Ana River, the proposed line will continue in a westerly direction and route around the Golf Course as shown in Figure 5C. It continues west to Interstate I15 through land previously used for dairy farming (see Figure 12C). This dairy land was recently sold and is currently under consideration for redevelopment and future construction. This is indicated as 1 and 6 in Figure 12C. As shown in Figure 14C, once the route reaches I15, it turns north paralleling I15 and passes alongside other land that is planned for future development. This land is shown in Figure 13C. In Figure 14C, this land is designated by 1 and 6 indicating it is privately owned land that is planned for future development and will need to be acquired for the proposed route.

Typical Transmission structure designs and conductor spans will be adequate for the proposed transmission line construction in this area.

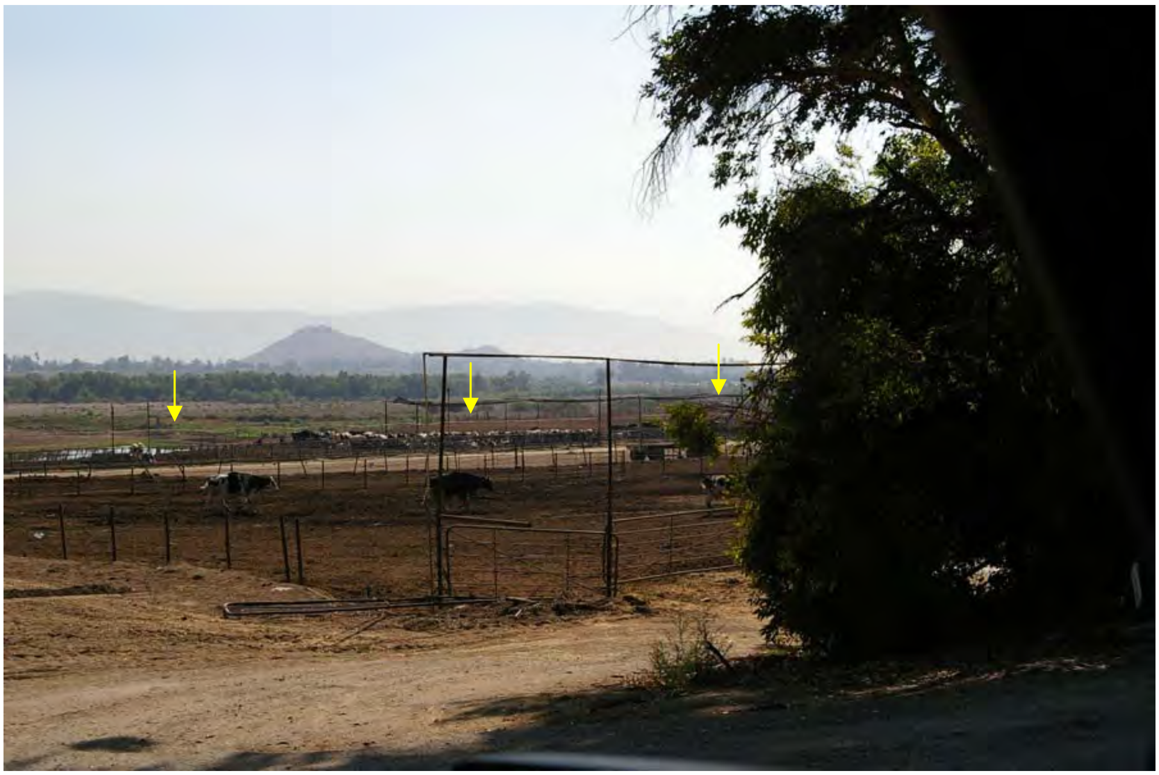

Figure 12C – This Picture Was Taken Northwest of The Golf Course And Is Looking Southwest. The Proposed New Line Will Cross Through The South End of This Dairy Land.

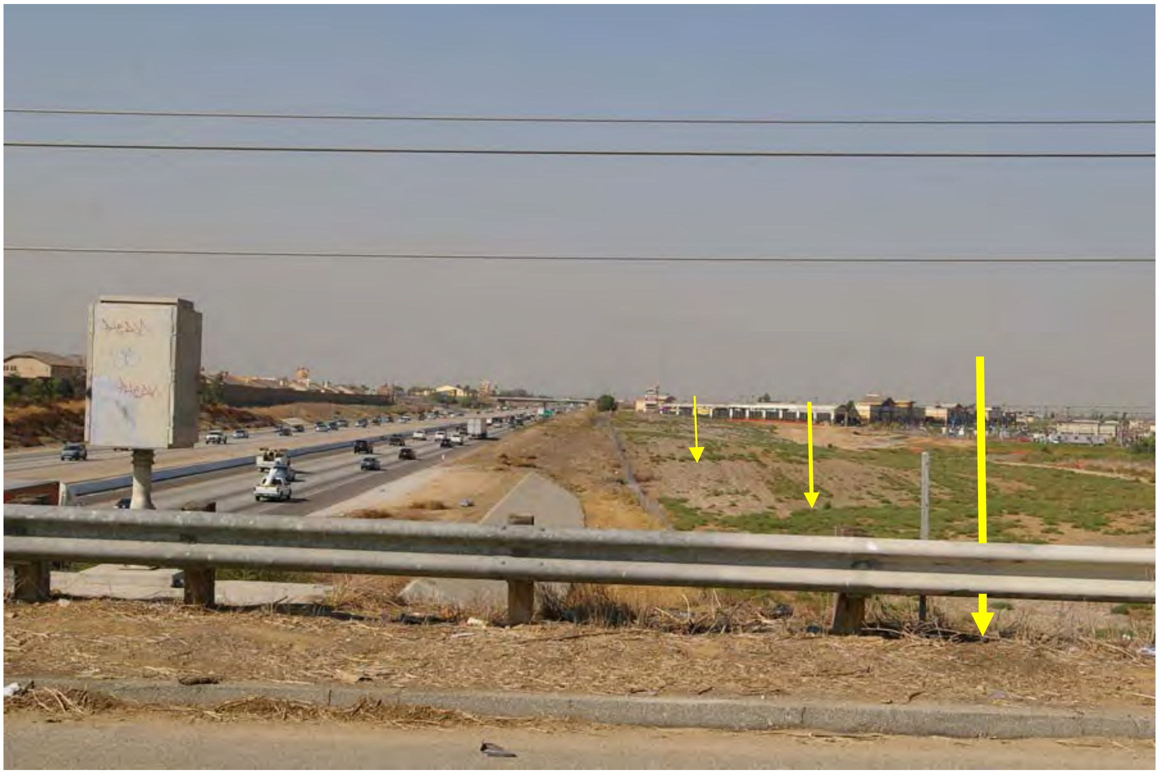

Figure 13C – This Picture Was Taken Alongside I15 And Is Looking North. The Proposed New Line Will Cross Through This Area Extending Northward. The Shopping Center Complex At Limonite Blvd Is Visible In The Middle Right Hand Side Of This Picture.

Shopping Center Complex At Limonite and I15

As the route extends northward alongside the I15, it approaches a shopping center complex at Limonite and I15 designated as 4 and 12 in Figure 14C. This a crucial 'choke' point along this route. At this point, the route cannot proceed northward along the I15 behind the complex as shown in Figure 15C, since CALTRANS is planning to expand the Limonite off-ramp from I15 into this area. As a result, the proposed line was rerouted through the parking lot area of the shopping center as shown in Figures 14C and16C. Approximately three transmission support pole structures will be placed in the parking area displacing approximately 16-20 parking spaces. Accommodations will need to be arranged to replace these displaced parking spaces.

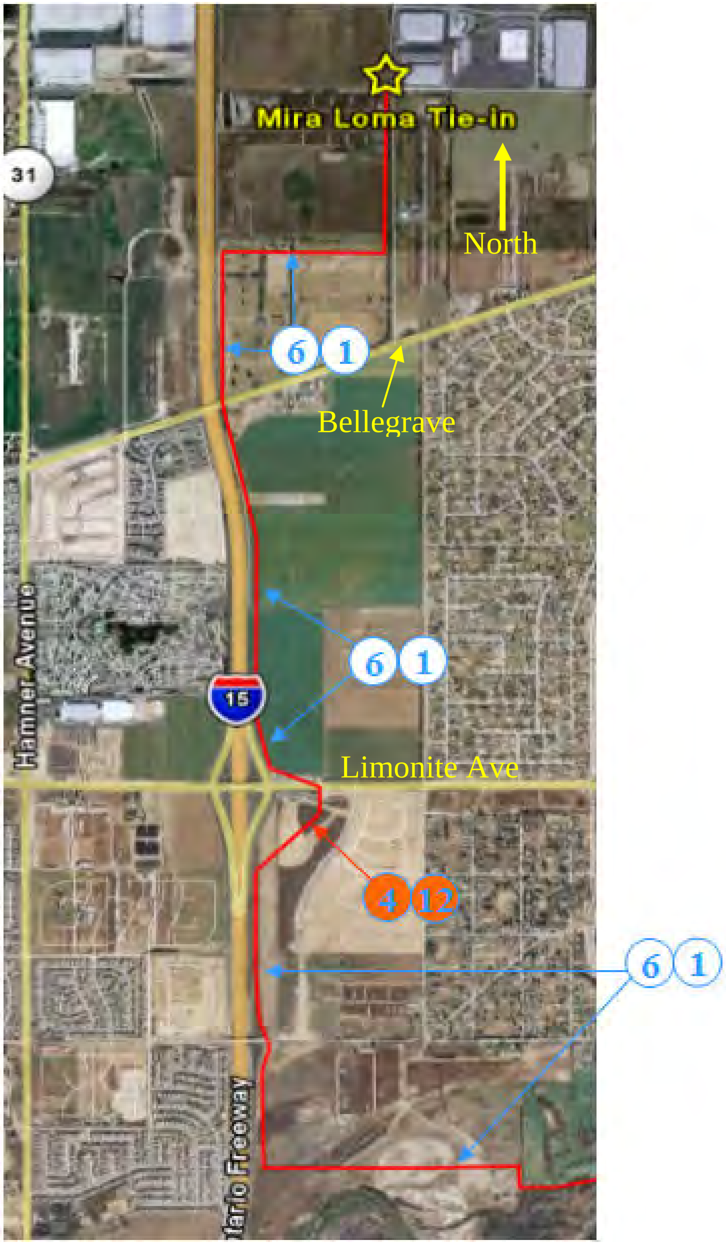

Figure 14C – The Proposed New Transmission Line Will Approximately Parallel I15 And Extend North To The Tie-In Point With The Existing Transmission Lines From Mira Loma Substation.

Figure 15C – This Picture Was Taken Behind The Shopping Center At Limonite and I15 Looking South. The Lowe's Facility Is Shown In The Distance. I15 is on The Right Hand Side of This Picture as is Not Visible From This Angle. It Was Determined That The Proposed New Line Cannot Continue Northward Behind The Shopping Center Since CALTRANS is Planning To Expand The Off-ramp From I15 Onto Limonite In This Area. As a Result, The Line Was Rerouted Through The Shopping Center Parking Area.

Figure 16C – This Picture Was Taken In The Middle Of The Lowe's Facility Parking Lot Looking North. The Lowe's Facility Is Not Shown, But Is Left Of This Picture. The Proposed Transmission Line Is Routed Through The Middle Of This Area To Limonite Blvd. Approximately 16-20 Parking Spaces Will Be Displaced By Three Pole Support Structures. Accommodations To Replace These Displaced Parking Spaces Will Need To Be Made.

Continuing Northward Along I15 To The Tie-In Location

Once though the shopping center complex, the route crosses Limonite and approaches I15. It continues northward toward the 'tie-in' location paralleling the I15 as shown in Figure 14C. As the route approaches the 'tie-in', it turns east before the UPS Industrial Complex and extends on open private to Wineville Road. At Wineville Road the line turns north to the 'tie-in' location as shown in Figures 14C and 17C.

Typical Transmission structure designs and conductor spans will be adequate for the proposed transmission line construction in this area. High ground water tables may increase the foundation designs and constructions.

Figure 17C – This Picture Was Taken on Wineville Road At The 'Tie-In' Location With The Transmission Lines From Mira Loma Substation. The Picture Was Taken Looking In The Direction Of The Mira Loma Substation.

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SECTION D

EAST ROUTE

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EAST Route

Description

The East Route begins by extending due east from the location of the proposed new substation at Wilderness Avenue and continues along the southern side of the Santa Ana River. It continues in this easterly direction until it approaches a railroad bridge. At this point, the route branches two directions. One branch goes north across the Santa Ana River. It then continues northeast staying on the north side of the Santa Ana River area. The second branch continues eastward a short distance and then turns south to avoid crossing into a Railroad (RR) imposed exclusion zone around the end of the bridge. Union Pacific (UP) requires that any crossings of a railroad bridge must be a controlled minimum distance away from the end of the bridge. This exclusion zone requirement forced the route to branch north and south around this area. This second branch continues through the Auto-Auction parking lot, and then turns eastward crossing the UP ROW. It continues up the river in a northeast direction, staying within the southern portion of the Santa Ana River 100 year flood plane. This portion of the East route is shown in Figure 1D.

Routing in The First Section of The East Route

Figure 1D shows the beginning portion of the East route. As mentioned previously, two branches are necessitated a short distance out of the proposed substation as a result of a RR exclusion area around the end of the railroad bridge. This was discussed earlier.
As indicated in Figure 1D, the route exits from the proposed substation location into a land/water conservancy sensitive area indicated in Figure 1D as 15. Further upstream, the north branch crosses the Santa Ana River at the area designated 16, and the south branch traverses the Auto-Auction parking lot area designated 4. These two branches were necessitated to avoid the RR exclusion zones also shown in Figure 1D. Both routes then continue upstream in a northeasterly direction, essentially straddling the Santa Ana River area.

Constructability Concerns For The First Section Of The East Route

Review of the proposed routings in this first section of the East route identified serious concerns for Southern California Edison (SCE). Based upon prior experience, SCE will not build a transmission line within a 100 year flood plane. Unfortunately, the two branches shown in Figure 1D are both either within or in very close proximity to the 100 year flood plane.

Experience has shown that during such a flood event, access to the Transmission support structure has been cut off due to flooding and erosion of the access roads from 4-6 weeks. This will not allow servicing of the Transmission lines during this extended period which is unacceptable.

Figure 1D – This Figure Shows The Beginning Segment of the East Route Proceeding East Out From The Proposed New Substation.

Routing in The Middle Section of The East Route

Figure 2D shows the middle portion of the East route. The previously discussed two branches merge into one of the south side of the Santa Ana River below the location where Mission Blvd crosses the river. The route then continues northeasterly past Mission Blvd, and then crosses the river indicated as 16 in Figure 2D. From that point the route continues up the river remaining on the north side.

Constructability Concerns For The Middle Section Of The East Route

Review of the proposed routings in this middle section of the East route also identified serious concerns. As shown in Figure 2D, there are potential conflicts with constructing the proposed transmission line on the levee. There is some concern that installing transmission structure may impact the structural integrity of the levee, which would be unacceptable. Relocating the transmission structure far enough away to not impact the levee integrity does not appear to be practicable.

The major concern, however, is when the route approaches the commercial properties at Fleetwood Drive. This is indicated as 12 in Figure 2D and Figure 3D. The transmission support structures cannot be constructed within the river proper or the 100 year flood plane for the reasons discussed previously. As a result, these structures must be placed outside these areas. When approaching Fleetwood Drive, this forces the structures to be placed on the high ground which presently contain the Fleetwood manufacturing complex.

Portions of this property would need to be removed to accommodate the placement of the Transmission support structures.

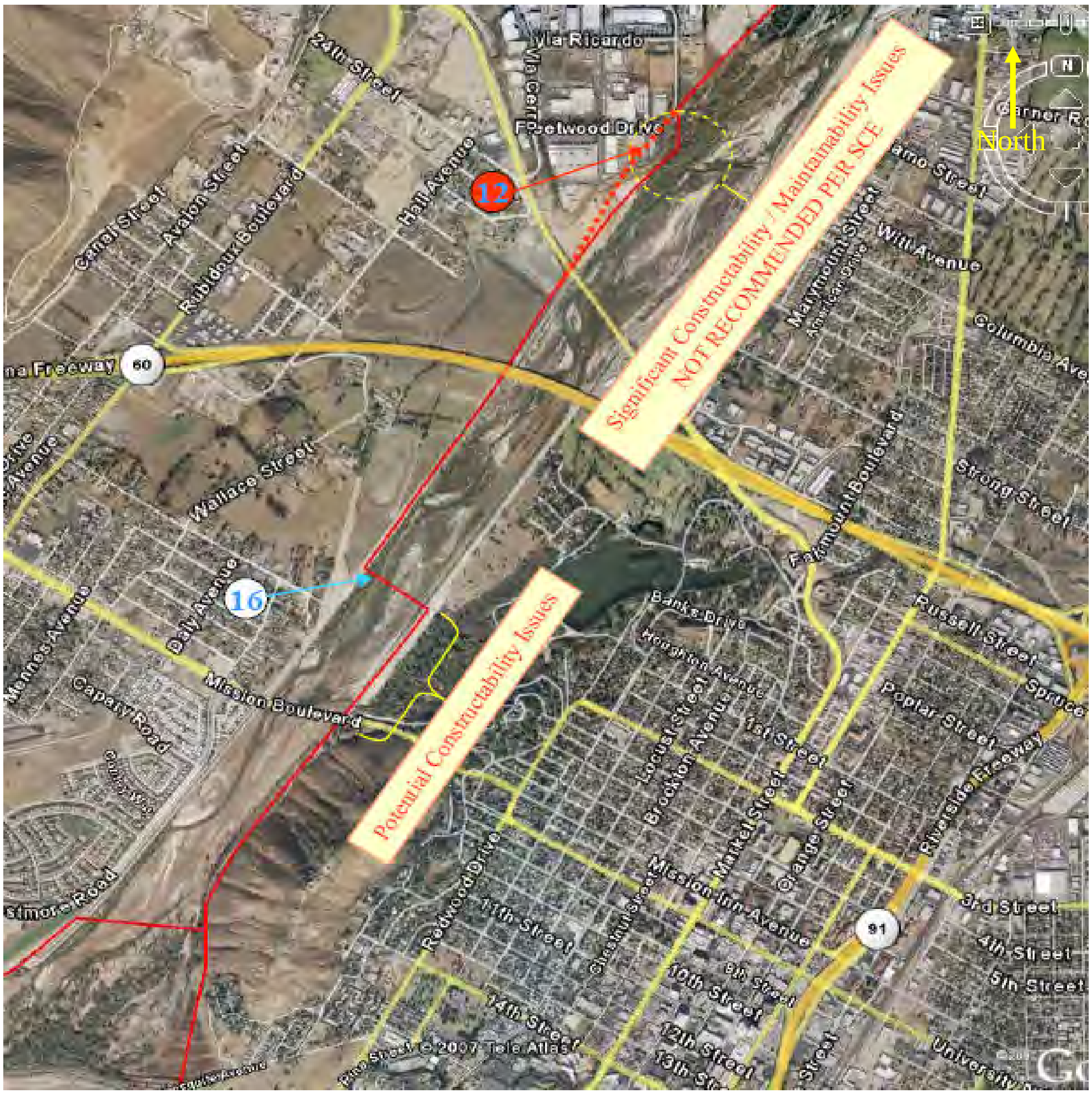

Figure 2D – This Figure Shows The Middle Segment of the East Route Proceeding To The Fleetwood Avenue Area.

Figure 3D – This Figure Shows The ‘Choke’ Point Of The East Route At Fleetwood Avenue. The Fleetwood Manufacturing Facilities (right hand side of the picture) Are Located On The High Ground Above The Santa Ana River area (left hand side of the picture). The Transmission Support Structures Cannot Be Constructed Within The Santa Ana River area proper, or on The Slopes (Which Are Within The 100 Year Flood Plane). Facilities For Fleetwood Manufacturing Would Need To Be Removed To Accommodate The Placement Of Transmission Support Structures. A Support Structure, For Example, Would Need To Be Placed In The Area Where The White Building Is Shown In This Picture. This Photograph Was Taken In November 2007.

Routing in The Upper Section of The East Route

Figure 4D shows the upper portion of the East route. From the middle section, the route continues northeasterly toward the tie-in point while remaining on the north side of the Santa Ana River area.

Constructability Concerns For The Upper Section Of The East Route

Constructability concerns identified previously in other segments of the East route are repeated here. As shown in Figure 4D, there is significant concern about flooding and erosion risks for the route situated adjacent to the river potentially within the 100 year flood area. To avoid this area, the route would need to be extended north a significant amount and cause displacement of some residential and commercial properties.

An additional concern in this area is environmental risk indicated as 13 in Figure 4D. Disturbance of the existing soils in this area during construction has a risk of impacting environmentally sensitive species. In addition, construction disturbances may trigger environmental cleanup issues that would be to be addressed in some portions of this segment of the route.

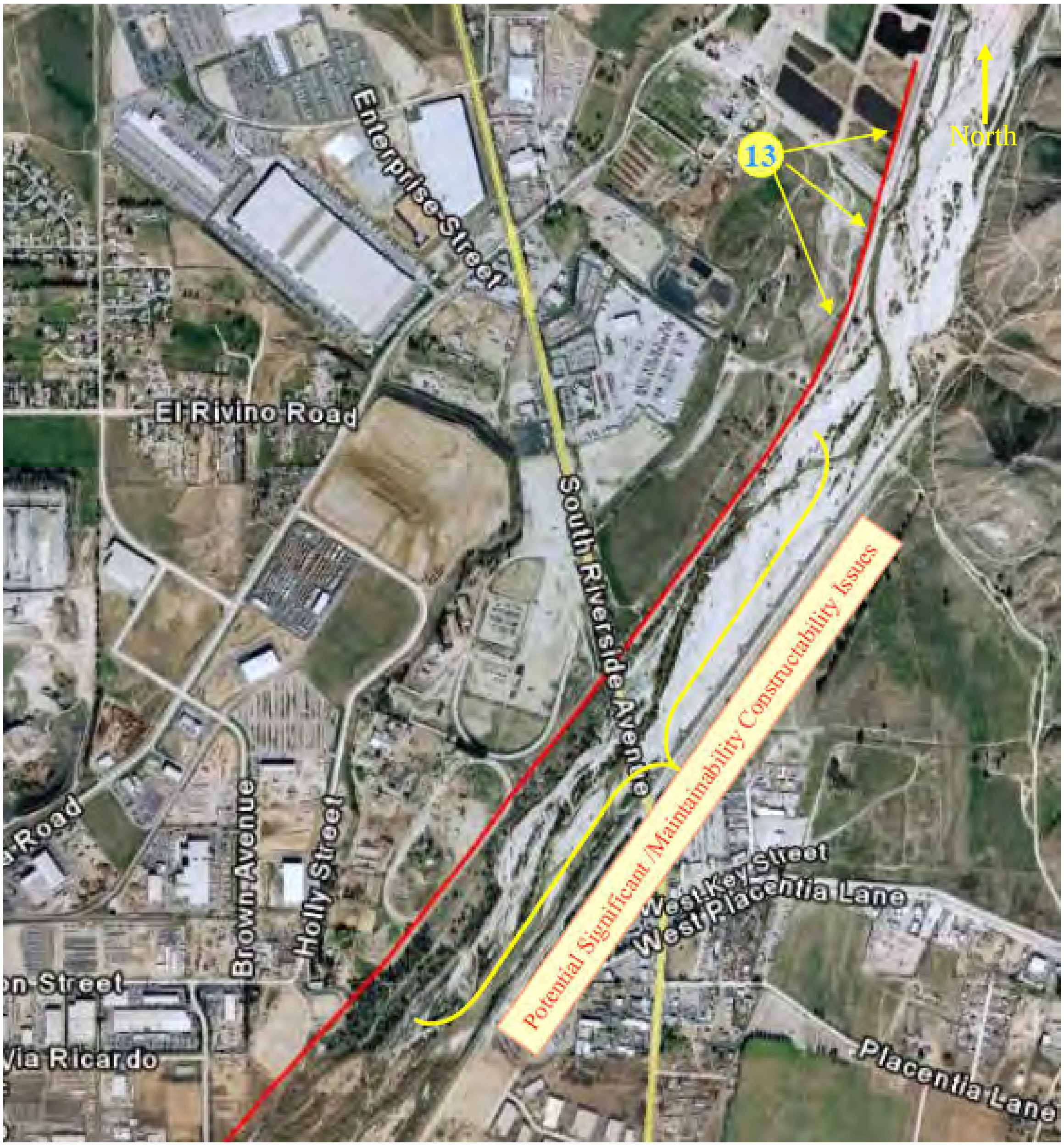

Figure 4D – This Figure Shows The Upper Segment of the East Route Proceeding To The Tie-in Area To The Mira Loma Transmission Lines.

SECTION E

ORIGINAL VAN BUREN ROUTE

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Original Van Buren Route

Original Van Buren Route – Along Union Pacific Right Of Way

The original Van Buren route was spotted on the Union Pacific (UP) Right-of-Way for the majority of its length and thus paralleled Van Buren Blvd. until it spanned across the Santa Ana River.

Notification from the Union Pacific officials dated September 5, 2006 (Appendix E) indicated that Union Pacific would not allow the placement of an electrical transmission line on their ROW.

Upon further evaluation of safety, costs for protecting UP control systems from induced interference effects, discussions with staff attorneys from the Surface Transportation Board in Washington D.C., and review of prior experiences with transmission lines on railroad company properties, SCE concluded that placement of the transmission line on the railroad right-of-way should be avoided. This route was therefore dropped. It is also noted that current SCE standards do not allow the placement of bulk power transmission lines on railroad right-of-way.

Bulk Power Transmission Lines on Van Buren Right-of-Way

An alternative for placing the bulk power transmission lines on the Van Buren ROW was looked at briefly, as well as, exploring a paralleling alternative west of Van Buren. These were determined to not be practicable. Van Buren is a major transportation corridor for traffic in that area. Trying to route a transmission line along any boundary of the Van Buren right-of-way would result in disruptive choke points and relocation of the traffic lanes that would inevitably impact the traffic flow.

Placing the transmission line on the west side of Van Buren was also looked at. It was determined that the west side already is planned for future expansion of Van Buren. To extend along this side would therefore require the transmission line to be located further west. This would result in requiring larger numbers of residential property takes.
As a result, this route was also dropped.

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APPENDICES

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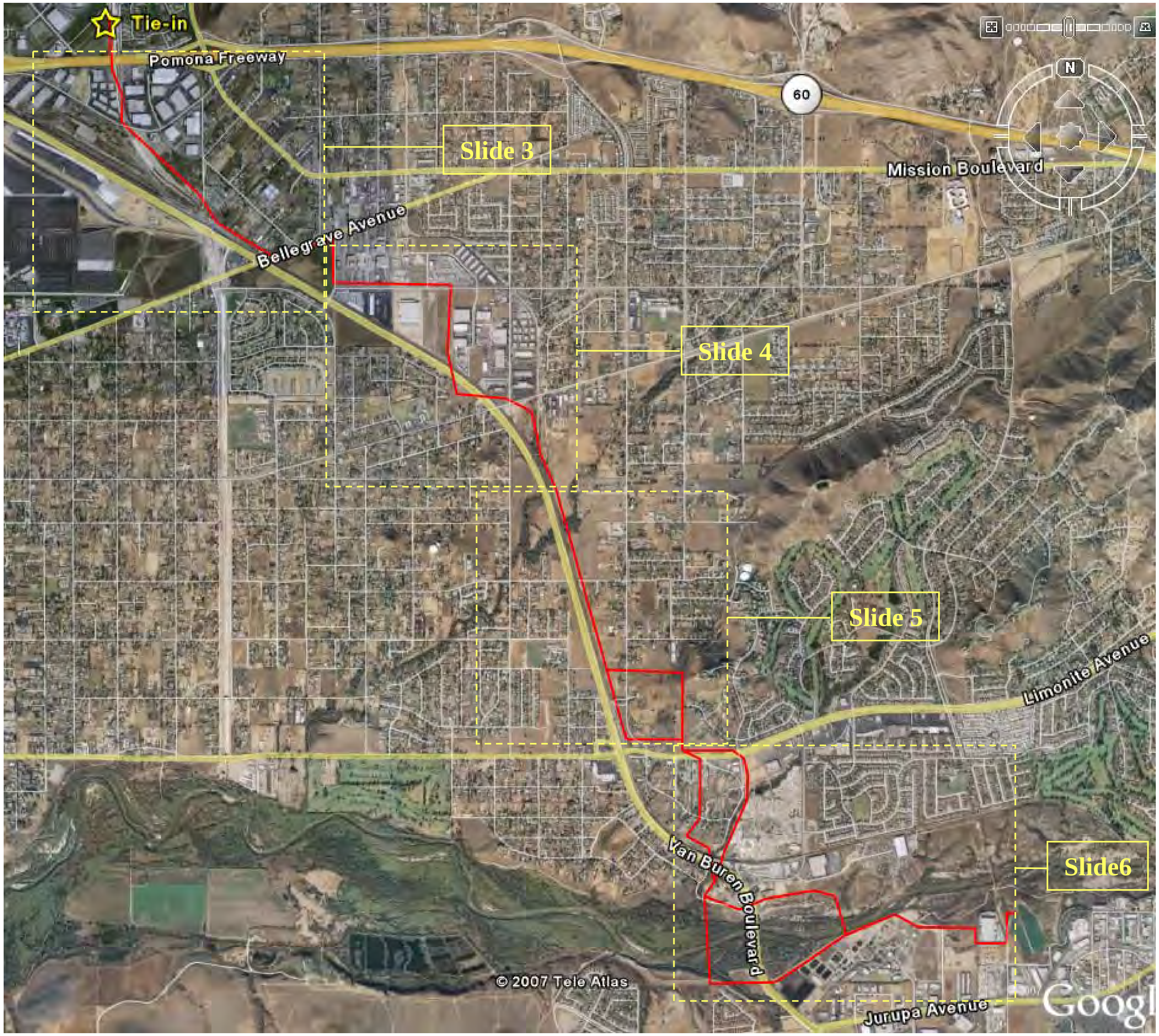
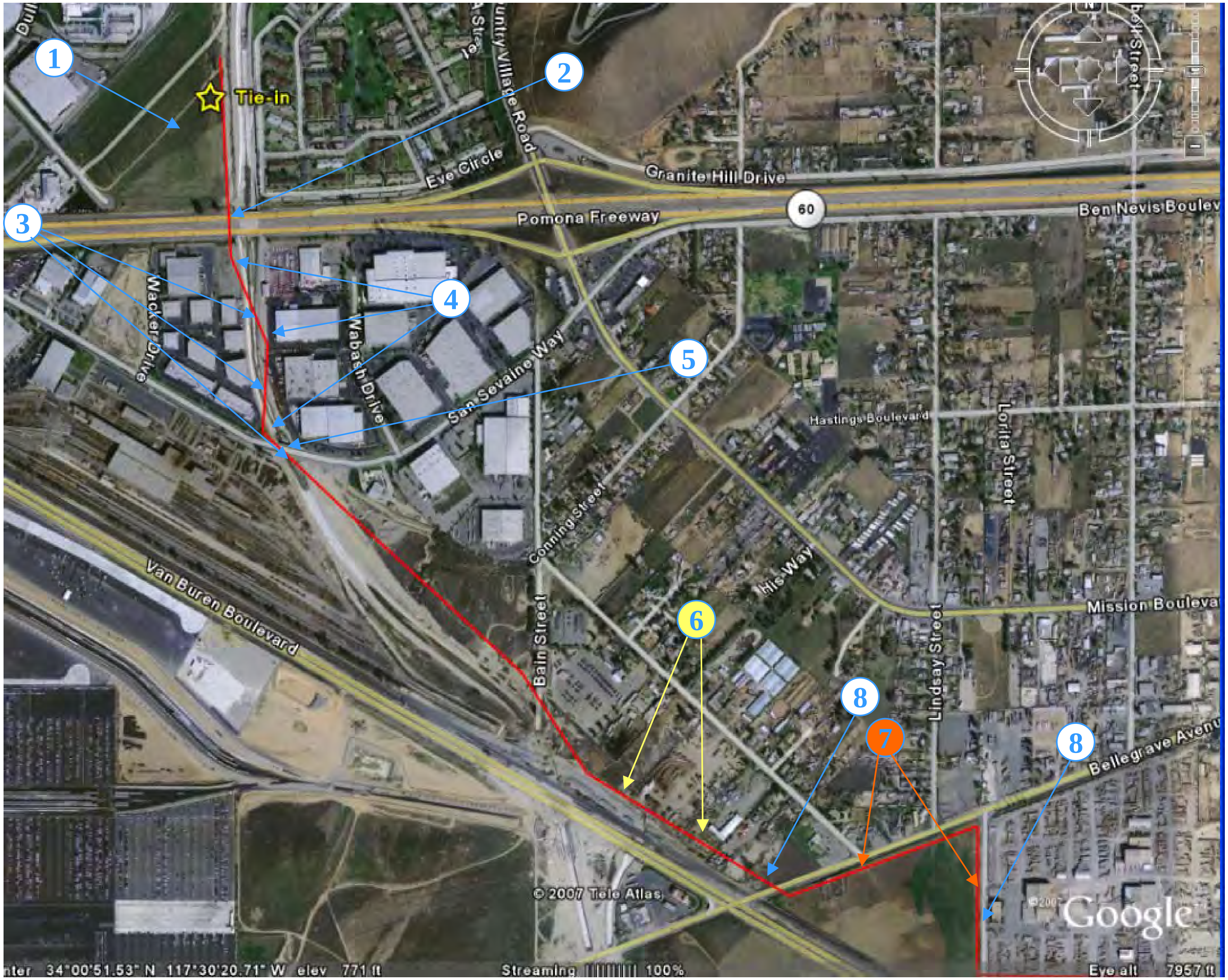
APPENDIX A

Van Buren Offset Route

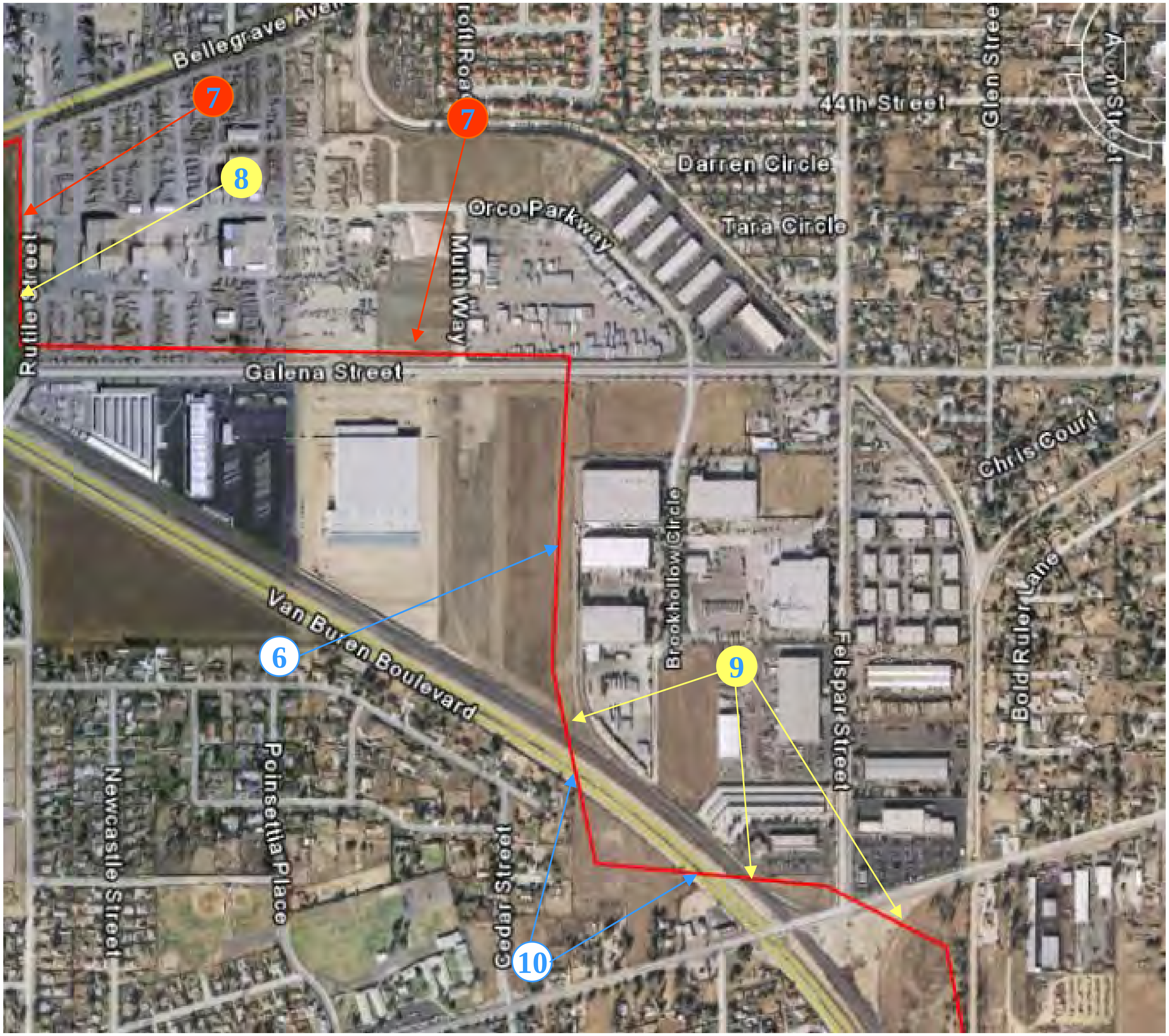
Van Buren Route – Issues – KEY



Van Buren Route - Issues

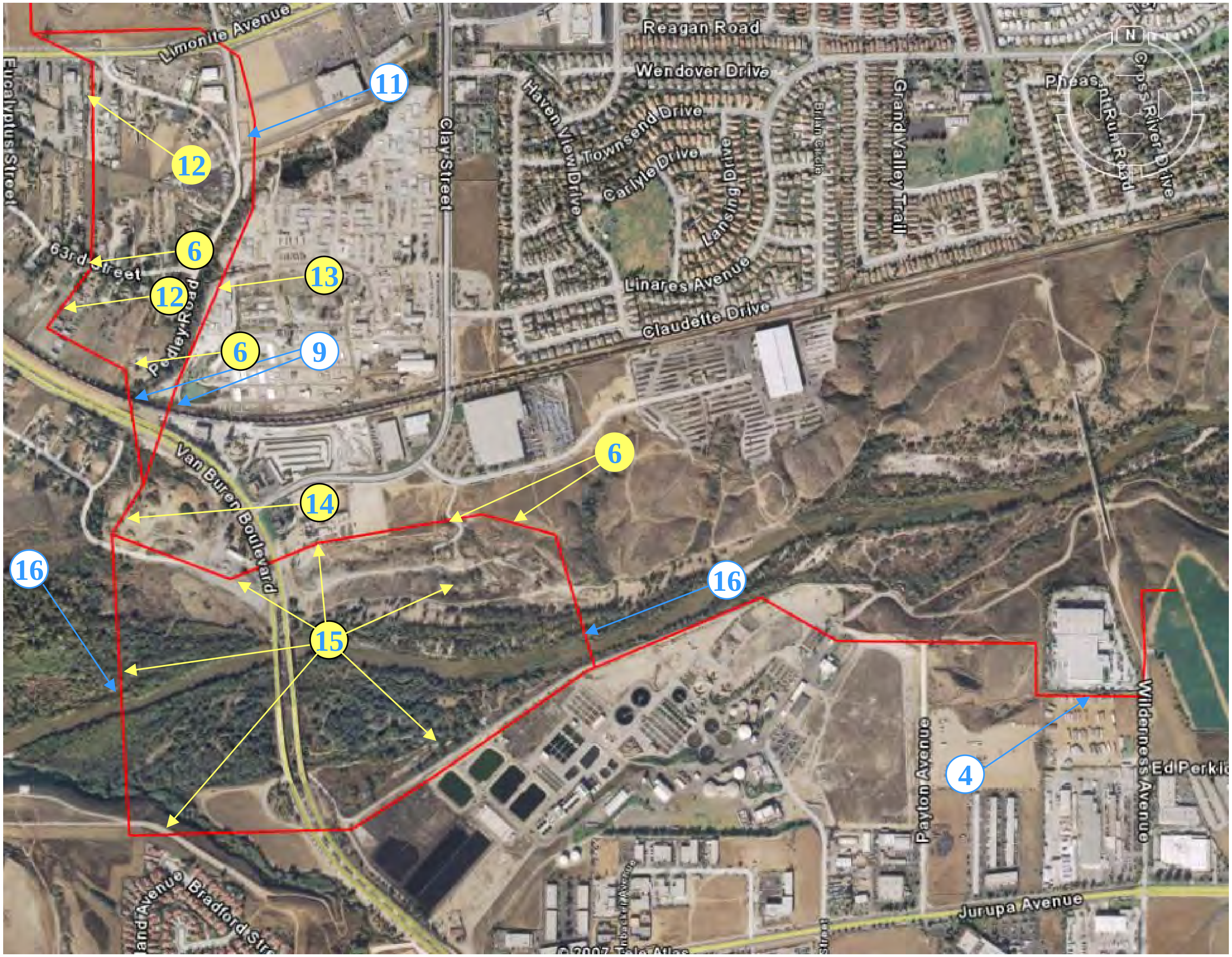


Van Buren Route - Issues



Van Buren Route - Issues

Van Buren Route - Issues



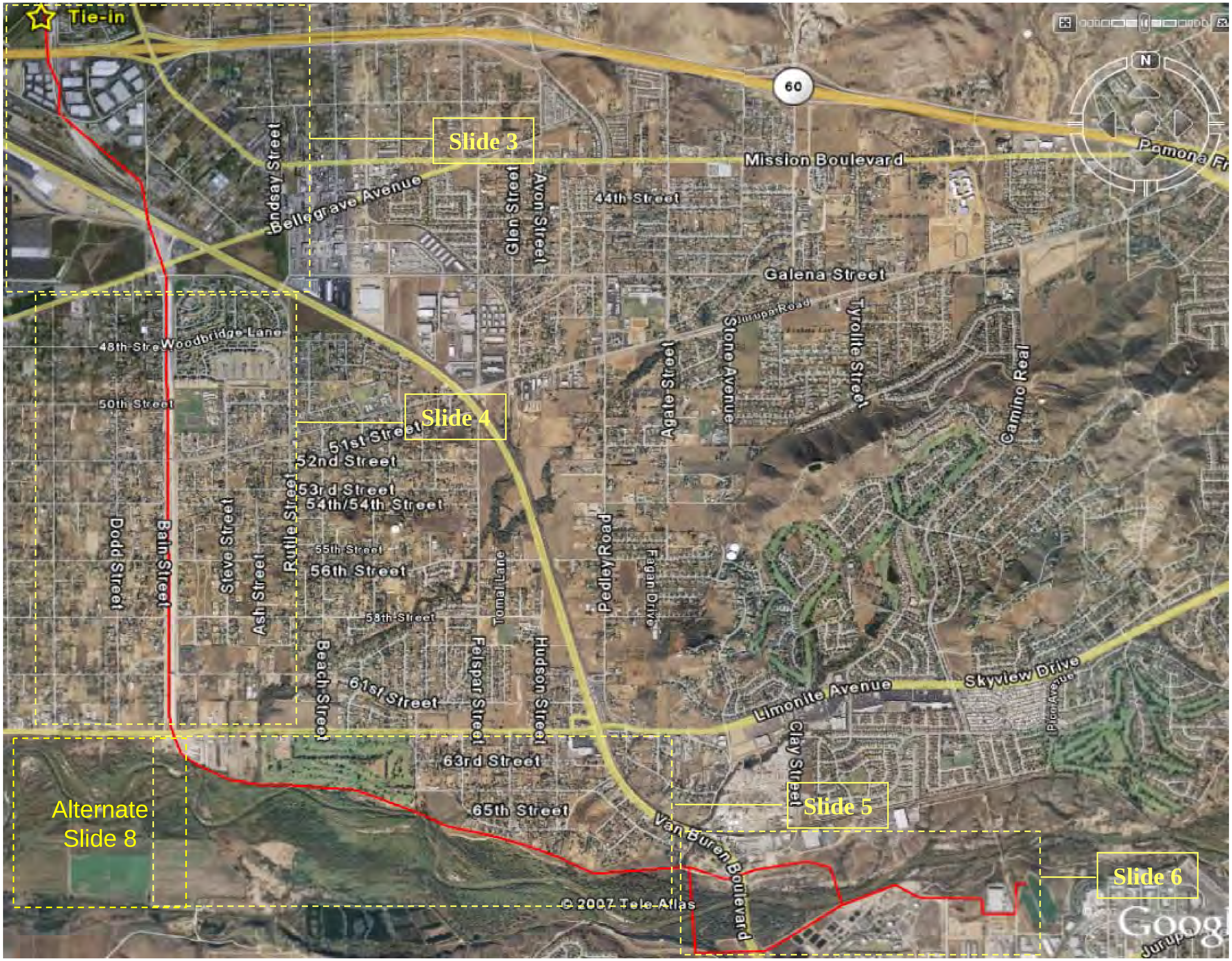
Van Buren Route – Issues - Legend

LEGEND	
Item No.	**Description**
1	Future Planned Development
2	Freeway Crossing
3	Riverside Flood Control Crossing
4	Securing Property For Pole Structures in Ex'tg Parking Lots / other
5	SoCal Gas Co. Gas Line Crossing
6	Private Land Takes - Ex'tg or Planned Structures Potentially Impacted
7	Choke Point' - Success Dependent Upon Single Land Owner
8	Distribution Line Crossing / Rework Required
9	Railroad Crossing - Constrained Angles
10	Van Buren Crossings - Future Road Expansion
11	Southern California Gas Company Gas Lines and Manifolds
12	Commercial Property Takes
13	Potential Environmental Cleanup Issues
14	Planned Facilities with 'High Political' Visibility
15	Land/Water Conservancy Sensitive Area
16	River Crossing
17	Southern California Floodcontrol District ROW
18	EMF Sensitivity Region

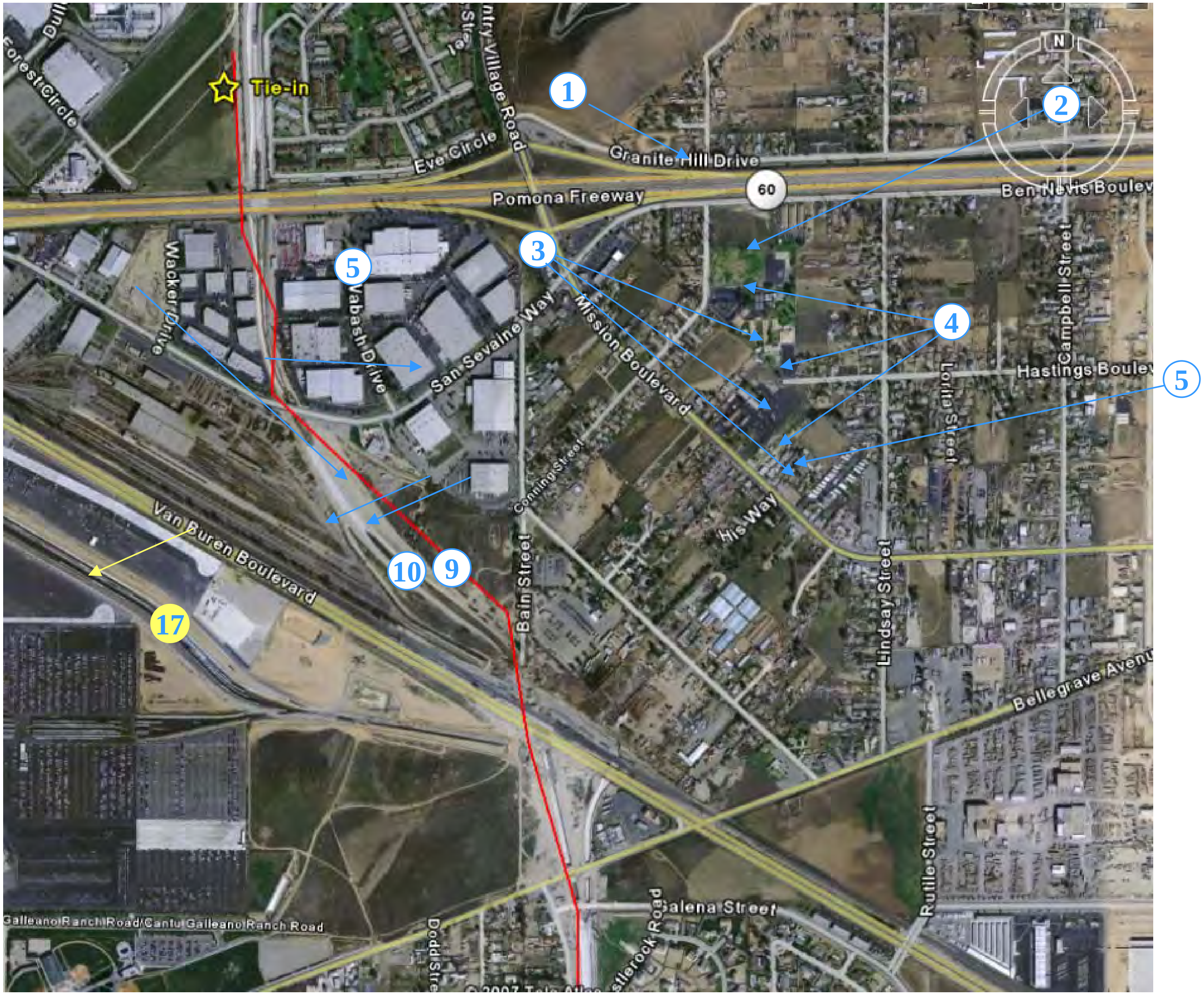
APPENDIX B

Bain Street Route

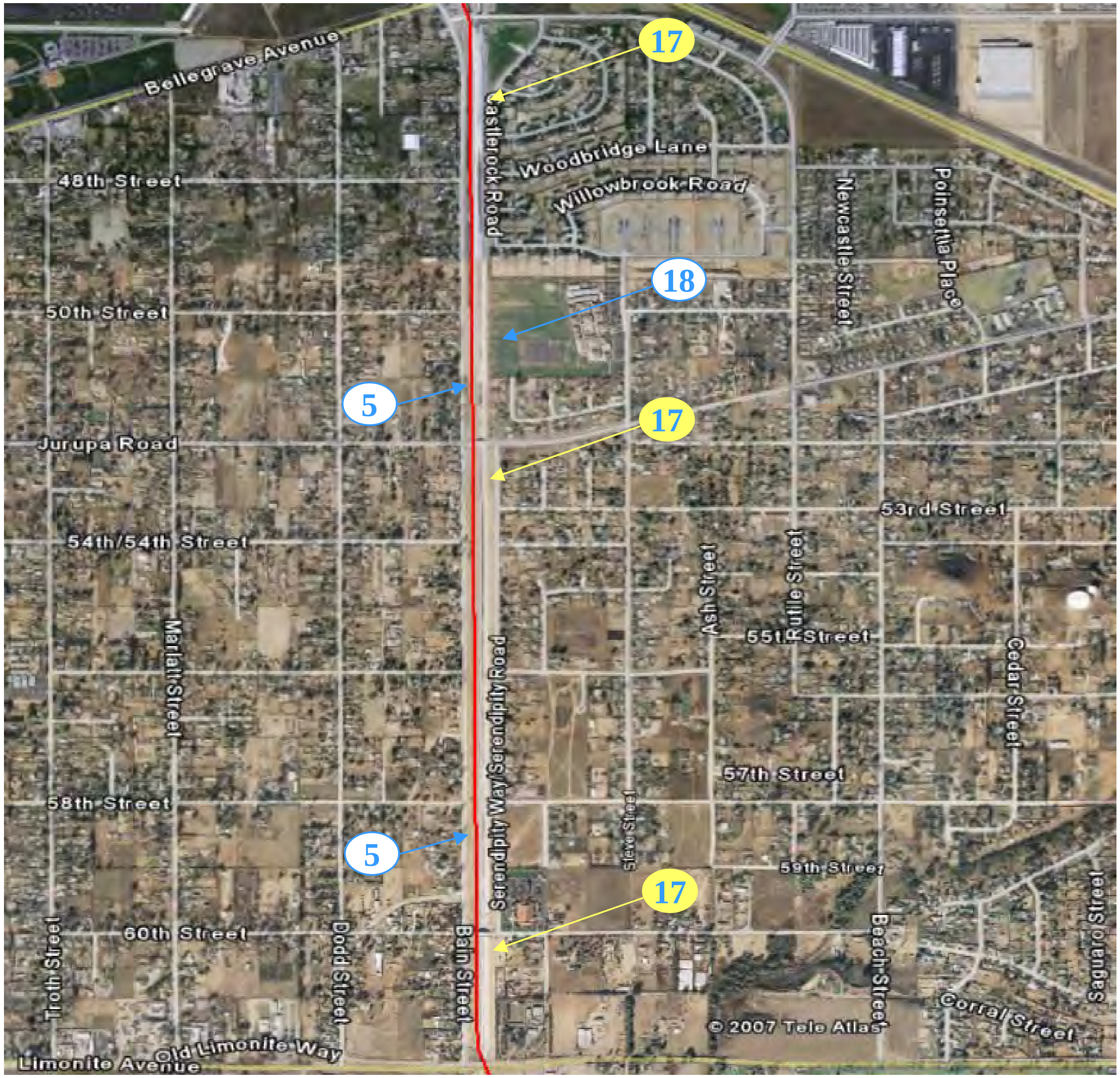
Bain Street Route – Issues - KEY



Bain Street Route – Issues



Bain Street Route – Issues



Bain Street Route – Issues

Bain Street Route – Issues

Bain Street Route – Issues - Legend

LEGEND	
Item No.	**Description**
1	Future Planned Development
2	Freeway Crossing
3	Riverside Flood Control Crossing
4	Securing Property For Pole Structures in Ex'tg Parking Lots / other
5	SoCal Gas Co. Gas Line Crossing
6	Private Land Takes - Ex'tg or Planned Structures Potentially Impacted
7	Choke Point' - Success Dependent Upon Single Land Owner
8	Distribution Line Crossing / Rework Required
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13	Potential Environmental Cleanup Issues
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16	River Crossing
17	Southern California Floodcontrol District ROW
18	EMF Sensitivity Region

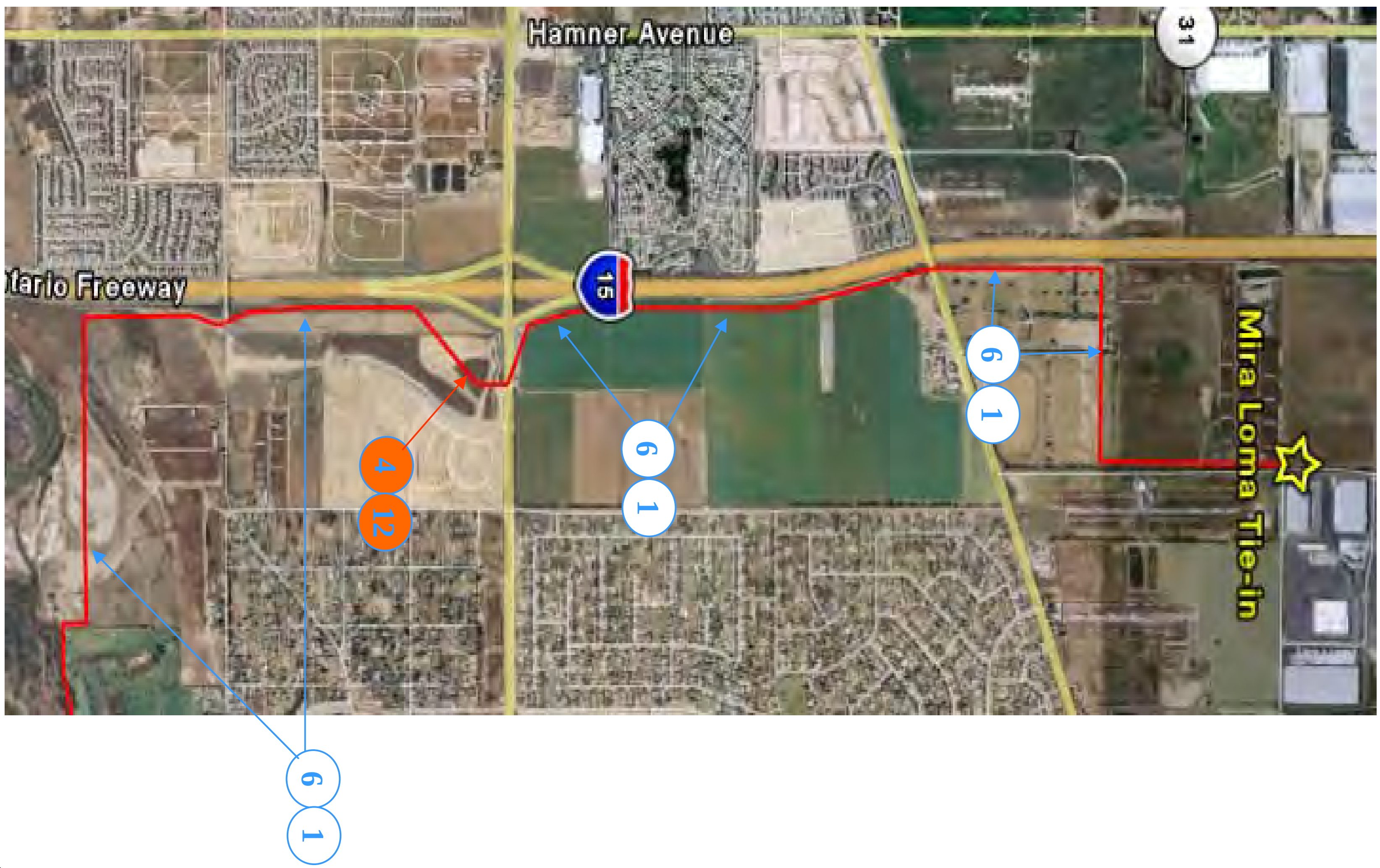
Bain Street Route – Alternate - Issues

APPENDIX C

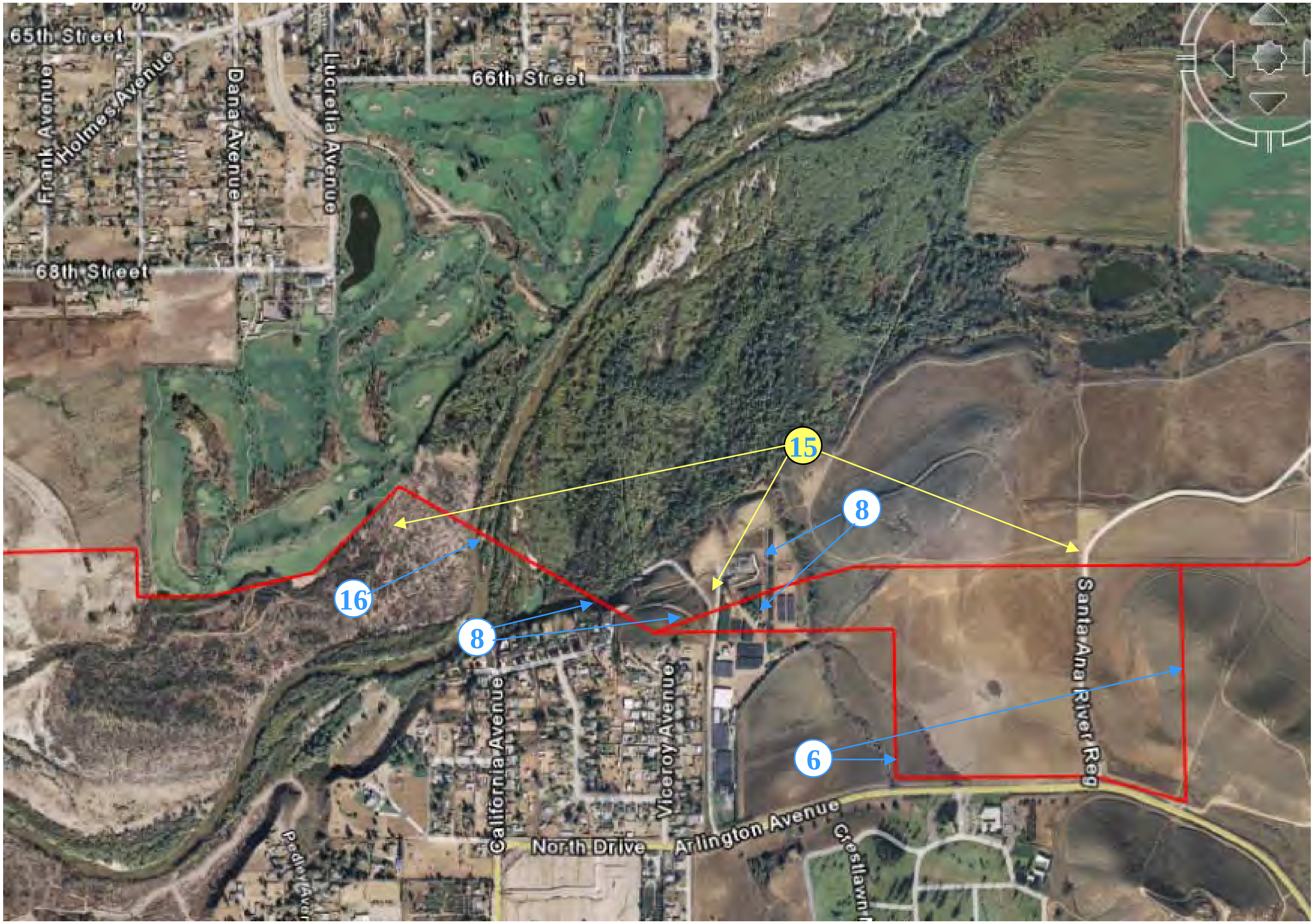
West Route
- Paralleling I15

West Route – Paralleling I15 – KEY

West Route – Paralleling I15 – Issues

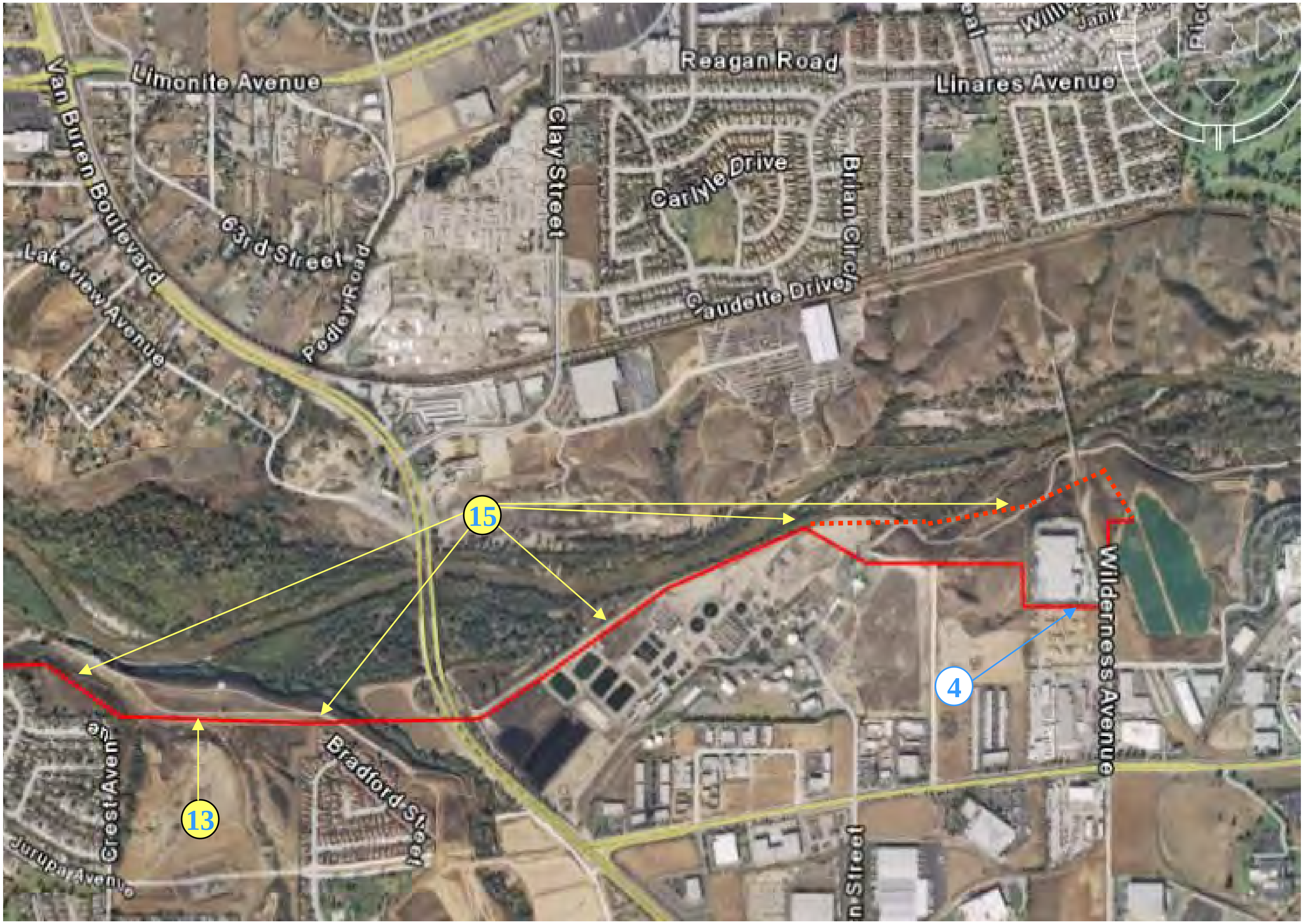


West Route – Paralleling I15 – Issues



West Route – Paralleling I15 – Issues

West Route – Paralleling I15 – Issues



West Route – Paralleling I15 – Issues

LEGEND	
Item No.	**Description**
1	Future Planned Development
2	Freeway Crossing
3	Riverside Flood Control Crossing
4	Securing Property For Pole Structures in Ex'tg Parking Lots / other
5	SoCal Gas Co. Gas Line Crossing
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10	Van Buren Crossings - Future Road Expansion
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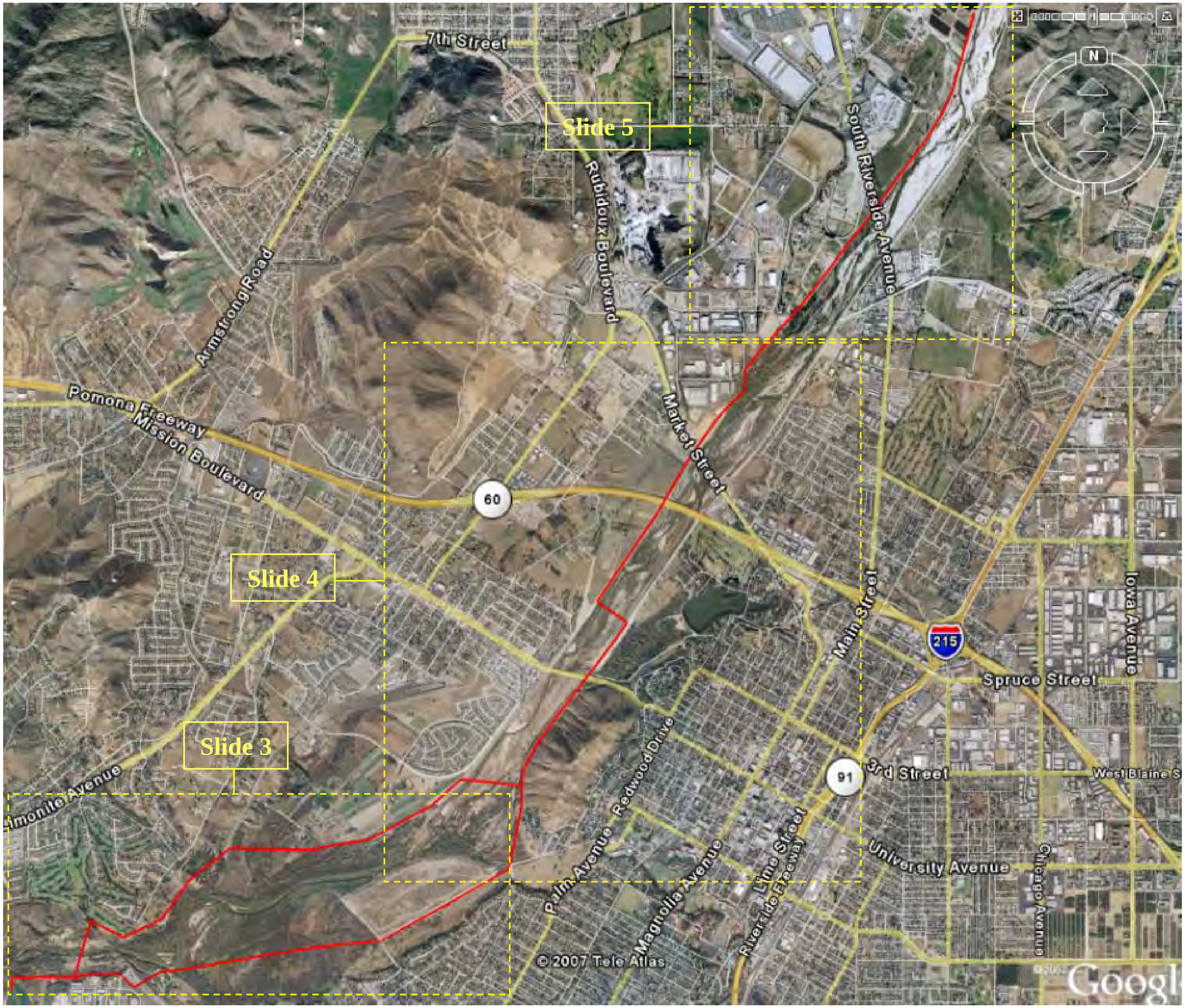
15	Land/Water Conservancy Sensitive Area
16	River Crossing
17	Southern California Floodcontrol District ROW
18	EMF Sensitivity Region

APPENDIX D

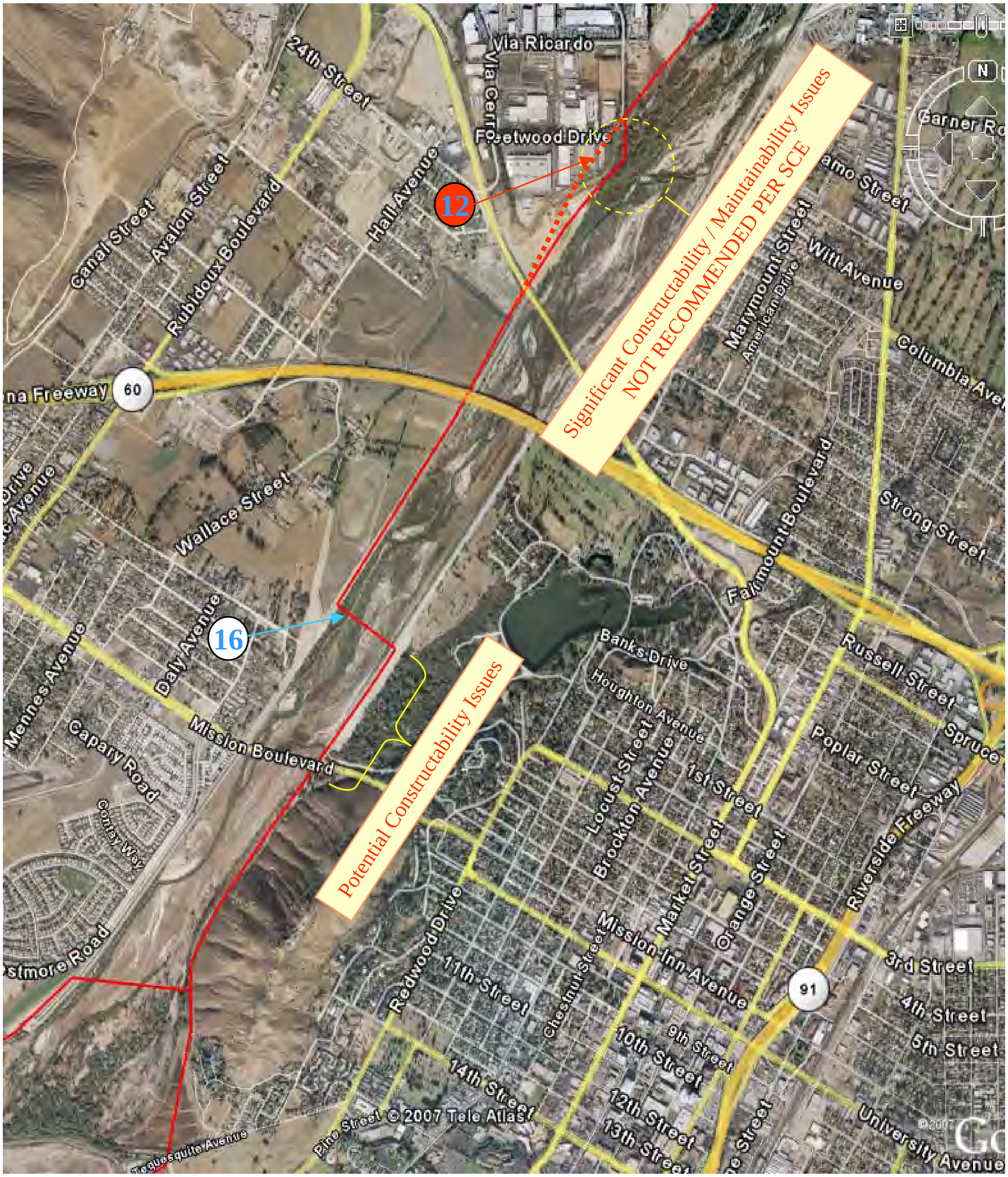
East Route

East Route – Issues - KEY



East Route –Issues

East Route –Issues



East Route –Issues

East Route –Issues

LEGEND	
Item No.	**Description**
1	Future Planned Development
2	Freeway Crossing
3	Riverside Flood Control Crossing
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APPENDIX E

Original Van Buren Route

Union Pacific Railroad Letter

September 5, 2006

MR STEPHEN BADGETT
CITY OF RIVERSIDE
3900 MAIN STREET
RIVERSIDE CA 92522

Dave Reddy

Dear Mr. Badgett:

RE: Permission to Survey

The Railroad is unable to execute your request to survey Railroad property for a proposed transmission line project.

The Railroad will not approve an electrical transmission wireline encroachment on Railroad right of way.

Sincerely,

Joan Preble

JOAN PREBLE
Manager Contracts
(402) 544-8536

jmpreble@up.com

RECEIVED
SEP 11 2006
Public Utilities Administration

Real Estate

UNION PACIFIC RAILROAD
1400 Douglas Street, Stop 1690
Omaha, Nebraska 68179-1690
fx. (402) 501-0340

Appendix 3

SCE Preliminary Geology and Geotechnical Evaluation, RTRP, Double Circuit 230 kV, Eastern, Western and Van Buren Offset Suggested Routes

SOUTHERN CALIFORNIA EDISON

Preliminary Geology and Geotechnical Evaluation

Riverside Transmission Reliability Project (RTRP)

Double Circuit 230kV T/L

Eastern, Western and Van Buren Suggested Routes

Mira Loma - Vista #1 230kV to Wildlife Substation

Riverside County, California

June 10, 2010

Project # 10-037

Revision 1

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL℠ Company

TDBU Civil/Structural & Geotechnical Engineering Group

Revision 1 June 10, 2010

Subject: **Preliminary Geology and Geotechnical Evaluation**
Riverside Transmission Reliability Project (RTRP)
Double Circuit 230 kV T/L
Eastern, Western and Van Buren Suggested Routes
Mira Loma - Vista #1 230 kV to Wildlife Substation
Riverside County, California

OVERVIEW SUMMARY

In order to meet the increased electrical demand associated with the growth within the Riverside Public Utilities (RPU) service area, the construction of double-circuit 230 kV transmission line is needed from the existing Mira Loma-Vista #1 230 kV line to a proposed City of Riverside substation called Wildlife. Three alignment alternatives are currently under consideration. These include Western, Eastern and Van Buren Alignments. This evaluation provides preliminary assessment of geologic and geotechnical constraints likely to be encountered during design, construction, and on going maintenance.

Placing the structure locations and access in or near the river is problematic from a structure and transmission line integrity point of view. Structure access during rains/floods would not be possible. Any road established in the floodplains of the river could be washed away at various times during the year and any road maintenance would be problematic.

Overall the Eastern route places 40 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 43 structures with erosion and 6 structures with slope stability potential. Maintenance access could be non existent for up to 40 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements. The Eastern route may not be able to perform the function intended, to serve the public with reliable transmission service.

Overall the Western route places 5 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 13 structures with erosion and 13 structures with slope stability potential. Maintenance access could be non existent for up to 5 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements.

Overall the Van Buren route places 9 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 3 structures with erosion and 3 structures with slope stability potential. Maintenance access could be non existent for up to 9 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements.

Based on this preliminary evaluation and the literature reviewed, it appears that from the perspective of foundation, and structure integrity, access, and long term maintenance, the Western and Van Buren Alignment alternatives both are clearly more favorable than the Eastern Alignment Alternative.

For clarification purposes, Revision 1 of this report includes an addendum dated May 17, 2010 which itemizes the number of structures for each route that are subject to liquefaction, erosion, slope instability or are within the 100 year flood zone.

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1.0 INTRODUCTION

In order to meet the increased electrical demand associated with the growth within the Riverside Public Utilities (RPU) service area, the construction of double-circuit 230 kV transmission line is needed from the existing Mira Loma – Vista #1 230 kV Line to a proposed City of Riverside substation called Wildlife. Several alignment alternatives are currently under consideration. These include a “Western Alignment”, an “Eastern Alignment” and a “Van Buren Alignment or Van Buren”.

Based on reviews conducted for this assessment, the proposed alignment alternatives include towers at dead end and angle points with Tubular Steel Poles (TSP) constructed between the towers spaced at approximate distances of about 750 feet. Within the River corridor, the Eastern Alignment includes 4 towers and 64 monopoles based on the available staking table. The Western Alignment includes 57 structures (approximately 15 towers and 42 monopoles), and the Van Buren Alignment includes 15 structures (approximately 4 towers and 11 monopoles).

The data and recommendations included in this report are based on desktop study, helicopter tour was conducted on March 18, 2010 and the review of available literature & maps pertinent to the project. No subsurface exploration has been conducted. Structure locations were not staked and structure locations were not firm. The report does not contain sufficient information for the design of foundations for towers or the Tubular Steel Poles.

2.0 ROUTE DESCRIPTIONS

2.1 Eastern Route

The Eastern Route will tap into Mira Loma–Vista#1 230 kV just west of the Colton landfill, and extend westerly in the immediate river corridor approximately eight miles to the proposed Wildlife Substation. Much of this alignment is located in the river corridor within the floodplain of the Santa Ana River. The route is shown on Figure (1a & 1b), *Eastern Route Layout Map.*

2.2 Western Route

The Western Route will tap into Mira Loma–Vista#1 230 kV northwest of the intersection of Galena Street with Wineville Avenue, extend south along Wineville Avenue and Interstate 15 to 68th Street where it will turn east into the river corridor. The line will cross to the south bank of the Santa Ana River at the Mira Loma Golf course, and then continue easterly largely across vacant land on a low bluff above the south bank of the river. At Tyler Street the line will pass along the top of a granitic bluff north of a residential development, cross Van Buren Boulevard, extend along the south side of a sewage treatment plant and then through industrial/commercial properties to the proposed Wildlife Substation. The total length of this alignment is approximately 10 miles with approximately 6.5 miles within the immediate river corridor. The route is shown on Figure (2a & 2b), *Western Route Layout Map.*

2.3 Van Buren Route

The Van Buren Route will tap into Mira Loma–Vista#1 near the railroad easement east of Etiwanda Street and just north of the Pomona Freeway (CA 60), extend southerly generally along the railroad alignment and Van Buren Boulevard to Pedley Road and then westerly on the granitic ridges above the north bank of the Santa Ana River to a point just opposite the proposed Wildlife Substation. The line will cross the river to the proposed Wildlife Substation a few hundred feet east of the alignment of the existing gas line crossing. The total length of this alignment is approximately 7.25 miles with a little more than 1.5 miles within the immediate river corridor. The route is shown on Figure (3a & 3b), *Van Buren Route Layout Map.*

3.0 VICINITY GEOLOGIC SETTING

The project site is located in the northeast portion of the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys and similarly-oriented earthquake faults, and extends southward from the San Gabriel Mountain in the Transverse Ranges to several hundred miles into Baja California. The alignments are located within the northern portion of a large structural block of land known as the Perris Block which is part of the Peninsular Ranges Geomorphic Province of California. This block is bounded by the San Jacinto Fault on the northeast and Chino and Whittier-Elsinore Faults on the southwest. See Figure (4), *Regional Geologic Map With Proposed Eastern, Western and Van Buren Routes*.

4.0 PROJECT GEOLOGIC SETTING

The majority of the alignments are underlain by alluvium and older alluvium overlying granitic bedrock. Sediments are likely to be mixtures of clay, silt, sand and gravel. Alluvium in the active stream channel is likely to be poorly consolidated. Older alluvium typically occurs as elevated terraces along the banks of the river, and is likely to be better consolidated than the younger materials. Granitic bedrock is medium to coarse-grained and generally slightly foliated. Although weathered near the surface, granitic bedrock should be expected to be quite hard at shallow depth. Groundwater could be encountered in order of 15 to 35 feet below ground surface within the Santa Ana River corridor.

5.0 FAULTING & LOCAL SEISMICITY

There are no active faults that cross the three 230 kV routes. However, the routes are located in the seismically active southern California region, as shown on Figure (5) *Faulting & Local Seismicity Map*. An active fault is defined as a fault that has had surface displacement within Holocene time (about the last 11,000 years). According to California Geological Survey CGS, and United States Geological Survey (USGS) Open File Report 2008-1128, At the east end, the alignments extend to within about 4 miles of the San Jacinto fault - San Bernardino segment. At the west end, the alignments extend to within about 6.5 miles of the Chino-Elsinore fault and within about 9 miles of the Whittier-Elsinore fault. The San Andreas fault trends along a roughly northwest/southeast alignment and is located approximately 16.2 miles northeast of the northeastern-most 230 kV study area. The San Andreas fault zone delineates the boundary between two global tectonic plates known as the North American Plate and Pacific Plate.

6.0 LIQUEFACTION

Liquefaction is defined as the phenomenon of sudden decrease and loss of soil shear strength in a soil mass due to the development of excess pore pressures during an earthquake. Soil liquefaction may occur in submerged loose to medium-dense granular soils at the upper 50 feet during or after strong ground shaking. Ground motion must be intense with duration of shaking sufficient for the soils to lose shear resistance. The generation of excess pore pressure under un-drained loading conditions is a distinguishing characteristic of all liquefaction phenomena. The tendency for dry cohesionless soils to densify under both static and cyclic loading is well known. The tendency for densification occurs when saturated cohesionless soils under un-drained conditions are subjected to cyclic shaking typically caused by an earthquake. The densification in turn causes the soil mass to deform, and transfer the stress from the sand grains to the pore water thus causing excess pore pressure. The excess pore pressure will reduce the effective stress, which is the key to trigger liquefaction. The soil will liquefy when the effective stress is reduced to zero.

When the soil becomes liquefied and looses its shear strength, ground failures such as lateral spreading, flow failure and loss of bearing capacity occurs. The change of the soils volume will be seen at the ground level as surface settlement. The soils may be non-homogeneous which will cause the settlement to be non-uniform resulting in large differential settlement.

The potential for liquefaction at structure locations was evaluated on a preliminary basis. The various potentials for liquefaction were assigned primarily on the basis of the susceptibility of the general underlying material type. Risk Categories where defined as follows:

NA *Not Applicable*: Materials underlying the proposed structure location are not susceptible to liquefaction. No analysis is required.

L *Low*: Materials underlying the proposed structure location are expected to be moderately consolidated and to have a relatively low potential for liquefaction. Analyses of representative areas should be considered.

E *Evaluate*: Materials underlying the proposed structure location are expected to include fine-grained granular material that is poorly consolidated. A potential for liquefaction during seismic loading under high groundwater conditions is considered likely. Specific analyses of each proposed tower location should be considered.

G *Graded*: The structure is proposed within or near an area that has been graded or otherwise improved. Evaluation/mitigation of liquefaction may not be necessary or feasible.

Based on this classification, structures along the various alignments were assigned liquefaction risk potentials as follows:

Liquefaction Rating	**Number of Structures & [Structure Numbers]**		
	Eastern Route	**Western Route**	**Van Buren Route**
NA	20	73	57
L	11	9	0
E	24 [68,18-29, 56-59, 62-66, & 69-70]	0	3 [BX11- BX13]
G	15 [38-39, 67,40-49, & 60-61]	0	0

Mitigation of shallow liquefaction hazards can be achieved by using deeper foundations that extend below the liquefiable zone as shown on Figure (8), *Liquefaction Sites*. Liquefaction can occur at depths of 50 feet or greater.

7.0 FLOODING

Based on the review of FEMA Maps on Figures (11-14), *FEMA Map Eastern and Western Routes*, the flood potential for each structure has been assessed. The two floodplain conditions for 100 and 500 years floodplain are considered during the study. The 100 years or the 500 years refers to the recurrence interval. Structures along the alignments occur in defined flood hazard zones as follows:

Flood Zone	**Number of Structures & [Structure Numbers]**		
	Eastern Route	**Western Route**	**Van Buren Route**
100 Year Flood	40 [15-29, 32, 35, 41-42, 49-53, 55-70]	5 [AX15, & JB1-JB4]	9 [BX1, BX3-5, BX7-10, & BX13]
500 Year Flood	7	0	2
Outside 500 Year Flood	23	77	49

Along both the Western and Van Buren Alignments most of the structures are proposed well above the main river channel and are not likely to be subject to flooding hazards. Exceptions occur on the Van Buren Alignment where 9 structures are located in the 100-year floodplain along Pedley Road west of Van Buren Boulevard, and 5 structures on the Western Alignment.

Although precise survey of the tower locations is not currently available, comparison of flood elevations indicated on FEMA maps with rough tower elevations determined using publicly available references suggest that flooding along the Eastern Alignment could occur to depths exceeding ten feet at some of the tower locations and that flood depths of five to six feet are likely to be quite common. An elevated access road design above the 100 year flood level may not be feasible due to potential instability during flood conditions. In addition, mitigation of these flood levels in a manner that would assure 24/7 access to tower locations during flood periods would require extensive modification of the floodplain to construct appropriate access roads and tower pads. Allowing vehicles and individuals on the road during flood conditions may be restricted due to safety concerns. Such extensive construction in a major floodplain would likely require permitting through numerous local state and federal agencies.

The foundations and the towers have to be protected from the flood debris impact. Risk of such impact can be reduced by building a rip-rap or concrete protection system around the foundation. Failure to protect the foundation may jeopardize the stability of the structure. Soil washout plays a major role in the stability of structures that are placed in flood or river areas. Based on experience, the repair of such damage is very costly and is usually completed in a very tight window and most probably requires outage. These situations must be considered during the design phase.

8.0 EROSION

In addition to inundation, other hazards associated with flooding include scour and debris impact. Some examples are shown on Figure (15-17), *Erosion*. These hazards are included along with surface erosion not directly related to river flood stages to assign a relative risk of erosion-related hazard at the structure locations. Risk categories were loosely defined as follows:

NA Structure locations are not susceptible to erosion.

L Materials underlying the proposed structure location are expected to be generally non-erodible, given proper drainage control or the site is elevated with limited upslope catchment area.

M Materials underlying the proposed structure location are expected to include materials readily susceptible to erosion; drainage in the surrounding area is poor, the site is located within either the 100-year or 500-year flood plain, but near the margins of the drainage channel.

H The structure is proposed within or near the main floodway; site observations noted evidence of periodic flooding (existing damage that appears to be flood related, past repairs, piles of flood debris in the vicinity.

Based on this classification, structures along the various routes were assigned erosion risks as follows:

Erosion Rating	**Number of Structures & [Structure Numbers]**		
	Eastern Route	**Western Route**	**Van Buren Route**
NA	0	27	48
L	27	42	9
M	25 [6-7, 10, 14-16, 26-30, 32, 52, 54, 55, & 61-70]	13 [AX14- AX21, D6-D10]	0
H	18 [17-25, 49-51, 53, & 56-60]	0	3 [BX11 - BX13]

Access roads will also be under a high potential of erosion. An erosion control plan for construction sites may be required. The surface water from all sources must be conveyed off the roadway at frequent locations to control roadbed soil erosion. These roads will require routine erosion monitoring. The foundation of the structures located within the 100 year flood zone should be designed with additional scour that could be in range of 10 feet in addition to the design depth as shown in Figure (7), *Rip-Rap Erosion Protection System*. In general, risks associated with erosion might be mitigated using drainage control on building pads and along access routes. These mitigation measures can include berms and concrete swales to control normal surface runoff. Where structures will be located in areas subject to severe flooding, access routes and pads may require some combination of extensive rip-rap, shotcrete, hydro-seed and other measures to help protect the structures against serious undermining along with other damages, and to maintain appropriate access to the structures during flooding as shown in Figure (18), *Erosion Repair*.

9.0 SLOPE STABILITY

Potential risks associated with slope stability at proposed structure locations were assessed in terms of the height, gradient and proximity of nearby slopes taking into consideration the nature of the underlying materials. Slope stability issues in granitic terrain may be related to adversely oriented foliation or joins, excessive slope gradient of or height, rockfall from upslope areas, or surficial slumping in overlying soil and highly weathered rock. Some examples are shown in Figures (19 & 20), *Slope Instability*. Most of the hazards in granitic terrain are considered largely nuisance-level, limited in extent and/or readily mitigated.

Slope stability issues in sedimentary terrain (alluvium and older alluvium) are primarily related to the potential for erosion, slumping and bluff collapse either above or below the proposed structures. These hazards can be mitigated to a large degree by providing some combination of proper drainage control, judicious relocation, and the use of deepened foundations. Where structures are proposed near the base of steep slopes in alluvium, consideration should be given to increasing the distance between the structure and the slope or relocating the structure above deepened foundations at the top of the slope. The stability of access route must be considered as well.

Slope stability hazard categories were defined as follows:

NA Structure locations are not susceptible to slope instability.

L Little or no slope stability risk anticipated. Primarily identified for structures proposed on flat sites, at significant distances from slopes, or where underlying conditions are such that no significant risk is expected associated with nearby slopes. Specific slope stability analyses are not considered warranted.

M Some element of slope stability risk is anticipated; however, the risk is considered either primarily nuisance level, easily mitigated, or not of immediate concern. The potential for some slope stability risk should be considered in the design and planning process, possibly supported by specific slope stability analysis. The need for mitigation measures is considered low.

H Conditions at the structure locations require careful analysis of slope stability issues. Some degree of mitigation is anticipated.

Based on this classification, structures along the various routes were assigned slope stability risks as follows:

Slope Stability Rating	**Number of Structures & [Structure Numbers]**		
	Eastern Route	**Western Route**	**Van Buren Route**
NA	0	27	51
L	64	42	6
M	2 [9-10]	13 [AX14- AX21, & D6-D10]	3 [BX8 - BX10]
H	4 [52-55]	0	0

Most of the identified slope stability issues concern structures located close to either the top or toe of a steep slope. Most commonly these issues can be mitigated using deepened foundations (for structures located too close to the tops of slopes) or by moving the structure a greater distance from the slope, see Figures (9 & 10), *Slope Stability Repair*. Where concerns involve slopes in granitic terrain, in most cases, the mitigation will require assurance that foundations extend into firm lightly weathered bedrock. This typically might involve deepening foundations three to five feet beyond typical design depths. Where concerns involve slopes in sedimentary terrain, or on higher, steeper granitic slopes greater embedment depths – perhaps as much as fifteen to twenty feet beyond typical design depths might be required. In cases where greater depths might be indicated, it might prove more practical to relocate the structure.

10.0 BLUFF RETREAT

A series of structures (seven structures) included in the Western Alignment (D5 through D11) are proposed on a bluff elevated about 60 to 80 feet above the south bank of the Santa Ana River. Along the length of most of the bluff the main floodway defined for the 100-year flood extends essentially to the base of the bluff. This bluff can be expected to retreat from the shoreline similar to sea cliff retreat. Erosion likely continues almost barely on a yearly basis with periods of more accelerated erosion and bluff collapse. These periods of accelerated erosion are likely to occur primarily during major floods. East of roughly structure D5, the bluff is underlain by granite at the river flow level. The granite slope is inclined at nearly vertical in places and at some locations appears to have been degraded by past grading. Although some consideration should be given to retreat of these granite bluffs, the potential for significant retreat in these areas over the anticipated lifetime of the structure is considered low.

West of Structure D5, the bluff is underlain by older alluvium. Structures in this location are proposed at distances ranging from about 120 feet to 400 feet from the edge of the bluff. The older alluvium is far less resistant to weathering than the nearby granite. Careful consideration should be given to structures propose along this section of bluff. A systematic assessment of bluff top retreat based on a more detailed assessment of site geology and analysis of historic stereoscopic aerial photographs as these structures move through the planning and design phase.

11.0 CONSTRUCTION

Proposed structure locations were assessed in terms of difficulty of construction and maintaining access routes and level pads appropriate to accommodate vehicles/trucks normally anticipated to be needed during construction. Access was assessed in terms of the proximity of the proposed structure to existing through street and the level of grading judged necessary to establish access from existing through street to the proposed structure location. Along most of the Western and Van Buren routes, acceptable access appears to be available in the river corridor segments at relatively short distances from existing roads. Improvements including light paving and drainage control may be required in some areas.

12.0 ACCESS ROADS BEING AVAILABLE 24/7

Access roads are required for maintenance purposes and emergency situations over the lifetime of the structures. It is always desired to facilitate access to any site location because access for maintenance or repair can be needed at any time. The Engineering standards do not address the 24/7 requirement due to this being an operational need and not a technical need.

Much of the eastern Alignment is located within or near the 100-year flood plain segment of the Santa Ana River. Establishing appropriate access along this corridor will require extensive grading and modification of the river channel to construct an appropriately wide access road (approximately 16 feet) for SCE 40 tons maintenance truck. Engineering made an assumption that to maintain 24/7 access during a 100-year flood event, a road being two feet above the flood plane would be required. A severe flood impacting part or all of the access road may result in washing the access road away. In order to meet the above requirements there could be a great need for berms and retaining wall protection. The road would require importing earth fill probably exceeding 50,000 cubic yards per each linear mile of the proposed access road. The road embankments would require rip-rap or concrete (shotcrete) as protection from flood erosion. Placement of this system will have an effect on the river flow. Construction of such a project in the river channel would be expected to alter flood heights and would require careful hydrologic evaluation to ensure that properties adjacent to the floodplain are not compromised. Permitting such a structure would be a complicated process involving numerous agencies including the City and County of Riverside, the California Department of Fish and Game, the Department of Transportation, the Army Corp of Engineers, the Federal Emergency Management Agency, and probably several others. There would be many levels of technical reviews by official agencies. The project may also be challenged by independent consultants hired by nearby property owners and environmental groups to oppose the project as well as utility structures in existing easements such as the Gas Company and the Union Pacific Railroad. Therefore, the elevated road may not be feasible.

13.0 FOUNDATION TOP ELEVATION WITHIN THE 100 YEAR FLOOD ZONE

When locating structures, every attempt should be made to keep structures located out of river beds and other known flood hazard areas, in the Eastern route, several structures will either be located in the riverbed or adjacent to riverbeds with unprotected banks and within the 100 year flood zone. Foundations to be located in the flood zone or river beds shall be designed to accommodate an appropriate scour depth. The top of the foundation being two feet above the flood plane may reduce the trash impact on the foundation and eliminate the steel structure members from being underwater during the flood period as shown in Figures (6 & 16), *Concrete Impact and Erosion System Within Santa Ana River R/W* and *Erosion*. The foundations in such areas shall be designed based on the submerged condition and add a “trash” load at the maximum flood level which will be two feet below the top of the foundation. The “trash” load shall account for debris and tree sections or branches. The pressure of the water velocity of the river plays a major role in the dynamic impact.

14.0 CONCLUSION

This preliminary study has been prepared to aid in the evaluation of three alternative proposed Riverside Transmission Reliability Project alignments with particular emphasis on those sections of the alignments in the immediate vicinity of the Santa Ana River Corridor. The conclusions and recommendations of this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principles and practice within our profession in effect at this time in Southern California for studies of this magnitude.

Placing the structure locations and access in or near the river is problematic from a structure and transmission line integrity point of view. Structure access during rains/floods would not be possible. Any road established would be washed away at various times during the year and any road maintenance would be problematic.

A summary of the preliminary evaluation relating to the river flood zone is provided below.

<u>Eastern Route</u>

There are 24 structures (3.5 miles) with liquefaction potential which could jeopardize foundation and structure integrity.

There are 40 structures (5.5 miles) within a 100 year flood hazard zones which could jeopardize foundation and structure integrity. Special foundation and structure base elevations will be required to minimize, but not eliminate, integrity of the structures.

There are 25 structures in erosion potential areas at the edge of the flood zone and 18 structures in erosion potential areas in the flood zone. This situation could jeopardize foundation and structure integrity.

There are 6 structures in medium or high slope stability issues which could jeopardize foundation and structure integrity.

The access for the 40 structures in the 100 year flood zone could be limited or non-existent during flood conditions. If access was required for foundation or structure integrity stabilization access would need to be delayed until flood conditions subsided. The concept of elevated roads above a 100 year flood condition is considered infeasible due to the following:

A. Stability of an elevated berm road would be problematic during and after a flood condition,
B. Road berms in the flood zone may divert water in an undesirable way,
C. Permitting for elevated road berms would be very complex,
D. Maintenance personnel and equipment would not be able to use the roads during flood conditions due to personal safety concerns.

Overall the Eastern route places 40 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 43 structures with erosion and 6 structures with slope stability potential.

Maintenance access could be non existent for up to 40 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements. The Eastern Route may not be able to perform the function intended, to serve the public with reliable transmission service.

Western Route

There are 0 structures with liquefaction potential which could jeopardize foundation and structure integrity.

There are 5 structures within a 100 year flood hazard zones which could jeopardize foundation and structure integrity. Special foundation and structure base elevations will be required to minimize, but not eliminate, integrity of the structures.

There are 13 structures in erosion potential areas at the edge of the flood zone and 0 structures in erosion potential areas in the flood zone. This situation could jeopardize foundation and structure integrity.

There are 13 structures in medium or high slope stability issues which could jeopardize foundation and structure integrity.

The access for the 5 structures in the 100 year flood zone could be limited or non-existent during flood conditions. If access was required for foundation or structure integrity, stabilization access would need to be delayed until flood conditions subsided. The concept of elevated roads above a 100 year flood condition is considered infeasible due to the following:

A. Stability of an elevated berm road would be problematic during and after a flood condition,
B. Road berms in the flood zone may divert water in an undesirable way,
C. Permitting for elevated road berms would be very complex,
D. Maintenance personnel and equipment would not be able to use the roads during flood conditions due to personal safety concerns.

Overall the Western route places 5 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 13 structures with erosion and 13 structures with slope stability potential. Maintenance access could be non existent for up to 13 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements.

Van Buren Route

There are 3 structures with liquefaction potential which could jeopardize foundation and structure integrity.

There are 9 structures (approximately one mile) within a 100 year flood hazard zones which could jeopardize foundation and structure integrity. Special foundation and structure base elevations will be required to minimize, but not eliminate, integrity of the structures.

There are 0 structures in erosion potential areas at the edge of the flood zone and 3 structures in erosion potential areas in the flood zone. This situation could jeopardize foundation and structure integrity.

There are 3 structures in medium or high slope stability issues which could jeopardize foundation and structure integrity.

The access for the 9 structures in the 100 year flood zone could be limited or non-existent during flood conditions. If access was required for foundation or structure integrity, stabilization access would need to be delayed until flood conditions subsided. The concept of elevated roads above a 100 year flood condition is considered infeasible due to the following:

A. Stability of an elevated berm road would be problematic during and after a flood condition,
B. Road berms in the flood zone may divert water in an undesirable way,
C. Permitting for elevated road berms would be very complex,
D. Maintenance personnel and equipment would not be able to use the roads during flood conditions due to personal safety concerns.

Overall the Van Buren route places 9 structures in flood zone location conditions that could jeopardize the foundation and structure integrity of the double circuit 230 kV transmission line. Also, there are 3 structures with erosion and 3 structures with slope stability potential. Maintenance access could be non existent for up to 9 structures during flood conditions. Elevated roads in the flood zone are not considered feasible. Road maintenance in the flood zone would be a constant and costly effort which could be restricted by permitting requirements.

Route Summary

Based on this preliminary evaluation and the literature reviewed, it appears that from the perspective of foundation, and structure integrity, access, and long term maintenance, the Western and Van Buren Alignment alternatives both are clearly more favorable than the Eastern Alignment Alternative.

15.0 REFERENCES

1 Dibblee, T. W.; 2004; Geologic Map of the San Bernardino North/North ½ of San Bernardino South Quadrangles, San Bernardino and Riverside Counties, California; Dibblee Foundation Map DF-127.

2 Dibblee, T. W.; 2004; Geologic Map of the Riverside West/South ½ of Fontana Quadrangles, San Bernardino and Riverside Counties, California; Dibblee Foundation Map DF-128.

3 Federal Emergency Management Agency; 2008; Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Panel 682 of 3805; Map Number 06065C0682G; Effective date August 28, 2008.

4 Federal Emergency Management Agency; 2008; Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Panel 684 of 3805; Map Number 06065C0684G; Effective date August 28, 2008.

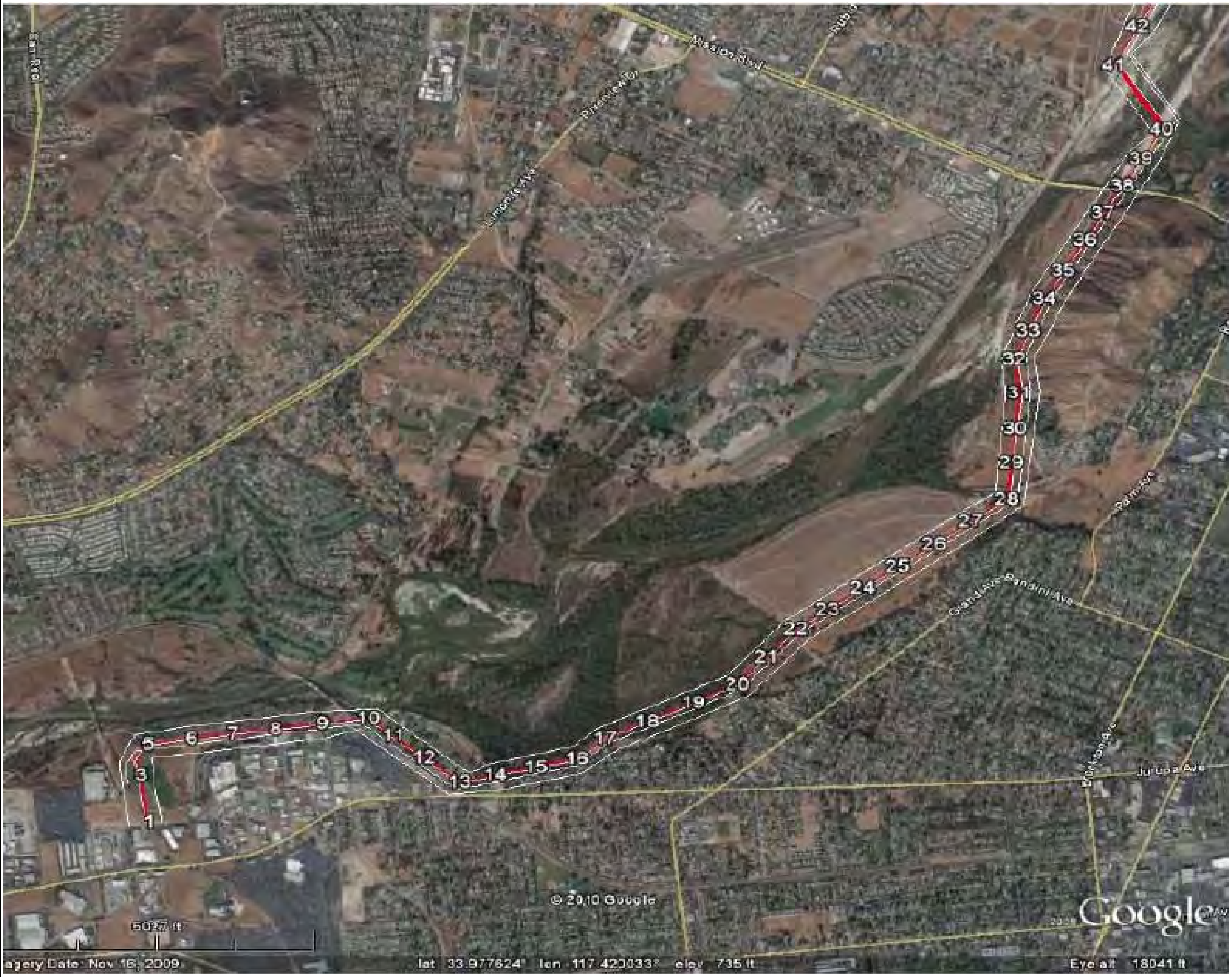
5 Federal Emergency Management Agency; 2008; Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Panel 702 of 3805; Map Number 06065C0702G; Effective date August 28, 2008.

6 Federal Emergency Management Agency; 2008; Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Panel 705 of 3805; Map Number 06065C0705G; Effective date August 28, 2008.

7 Federal Emergency Management Agency; 2008; Flood Insurance Rate Map, Riverside County, California and Incorporated Areas, Panel 706 of 3805; Map Number 06065C0706G; Effective date August 28, 2008.

8 USGS Open File Report 2008 - 1128.

9 Riverside Geologic Atlas Map



Eastern Route Layout Map

Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Eastern Route

Location: Riverside County, CA

Source: Google Earth

TDBU Civil/Structural & Geotechnical Engineering Group

Figure No.

1a

Eastern Route Layout Map

Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Eastern Route

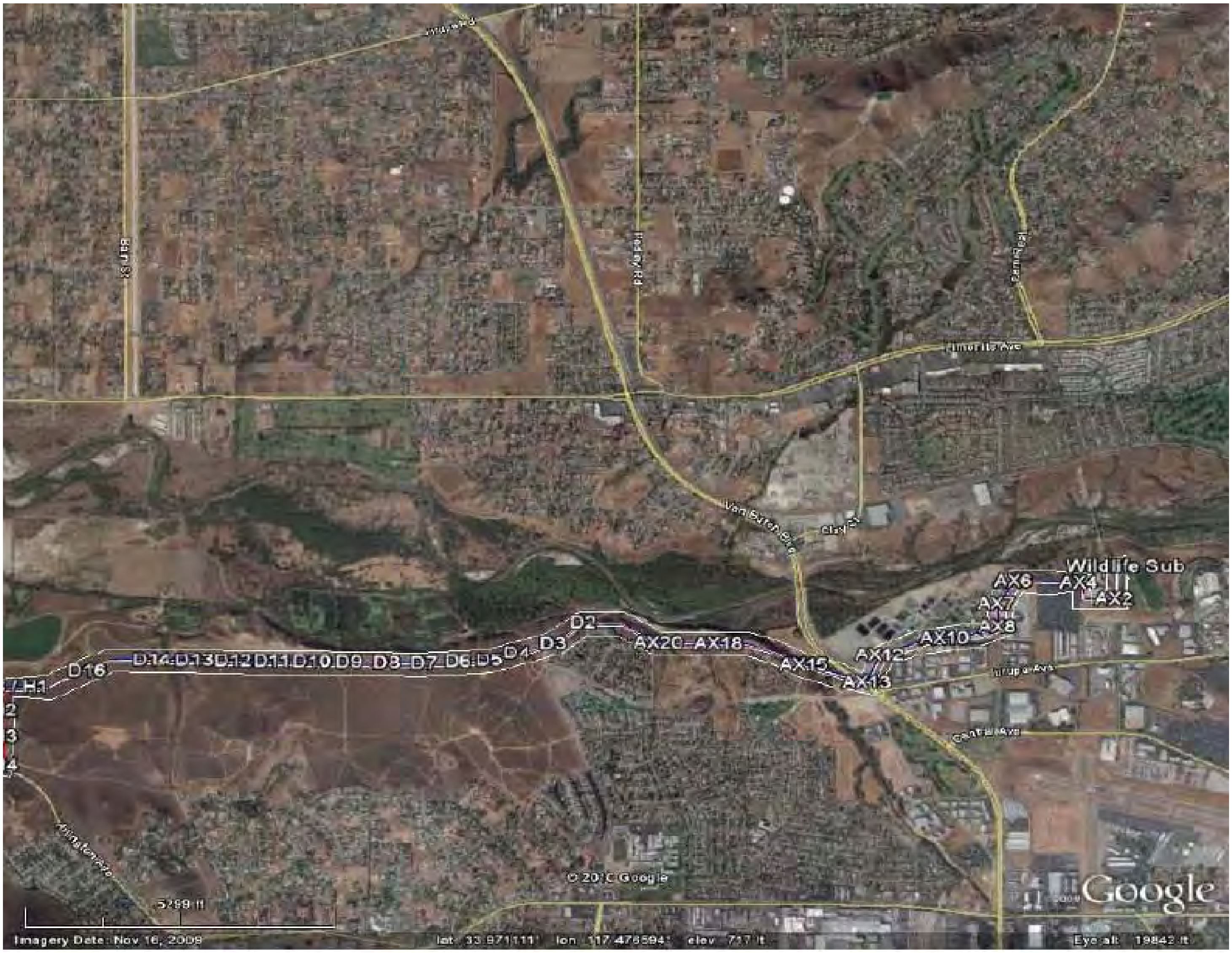
Location: Riverside County, CA

Source: Google Earth

TDBU Civil/Structural & Geotechnical Engineering Group

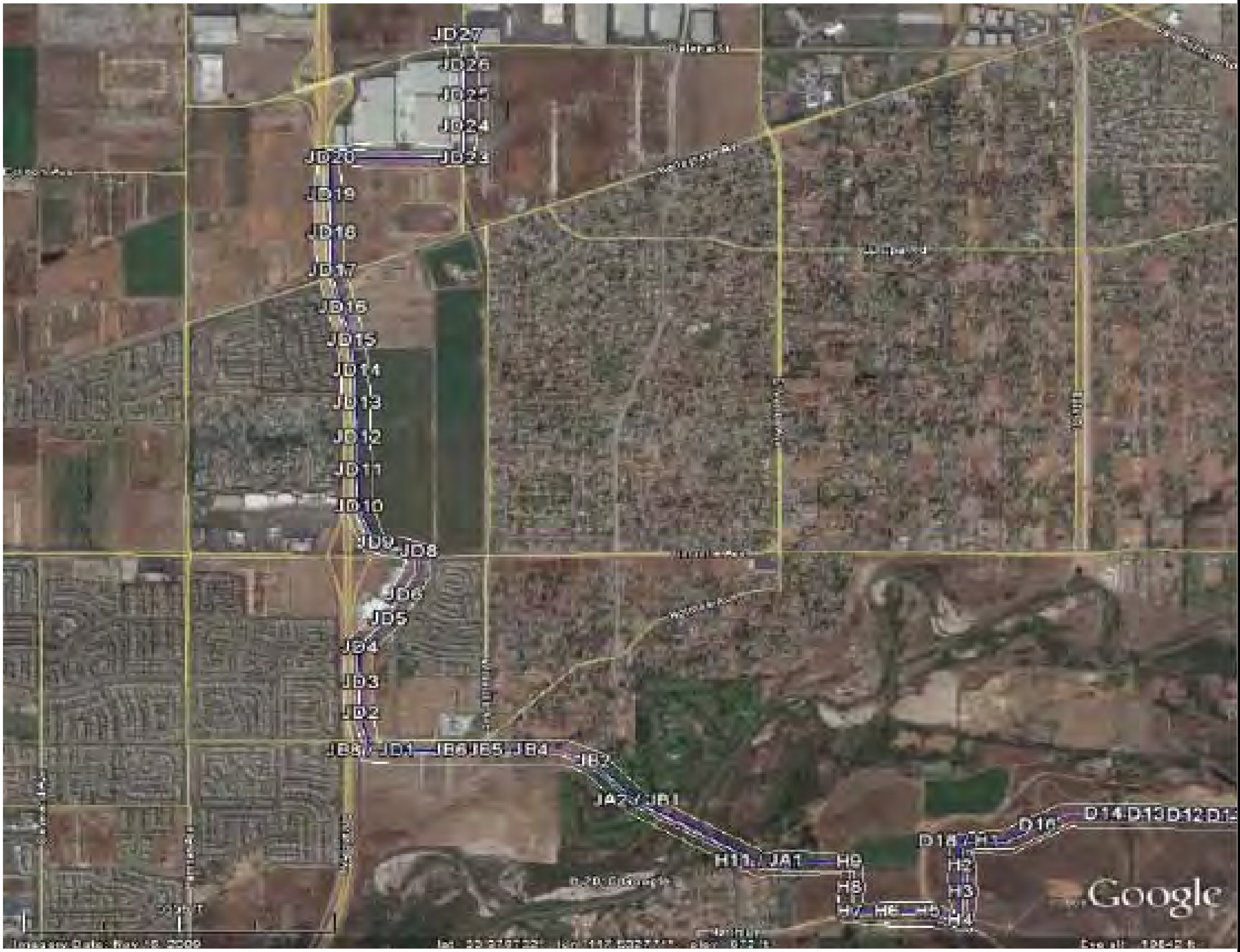
Figure No.

1b



Western Route Layout Map

Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Western Route Location: Riverside County, CA	Source: Google Earth
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **2a**



Western Route Layout Map

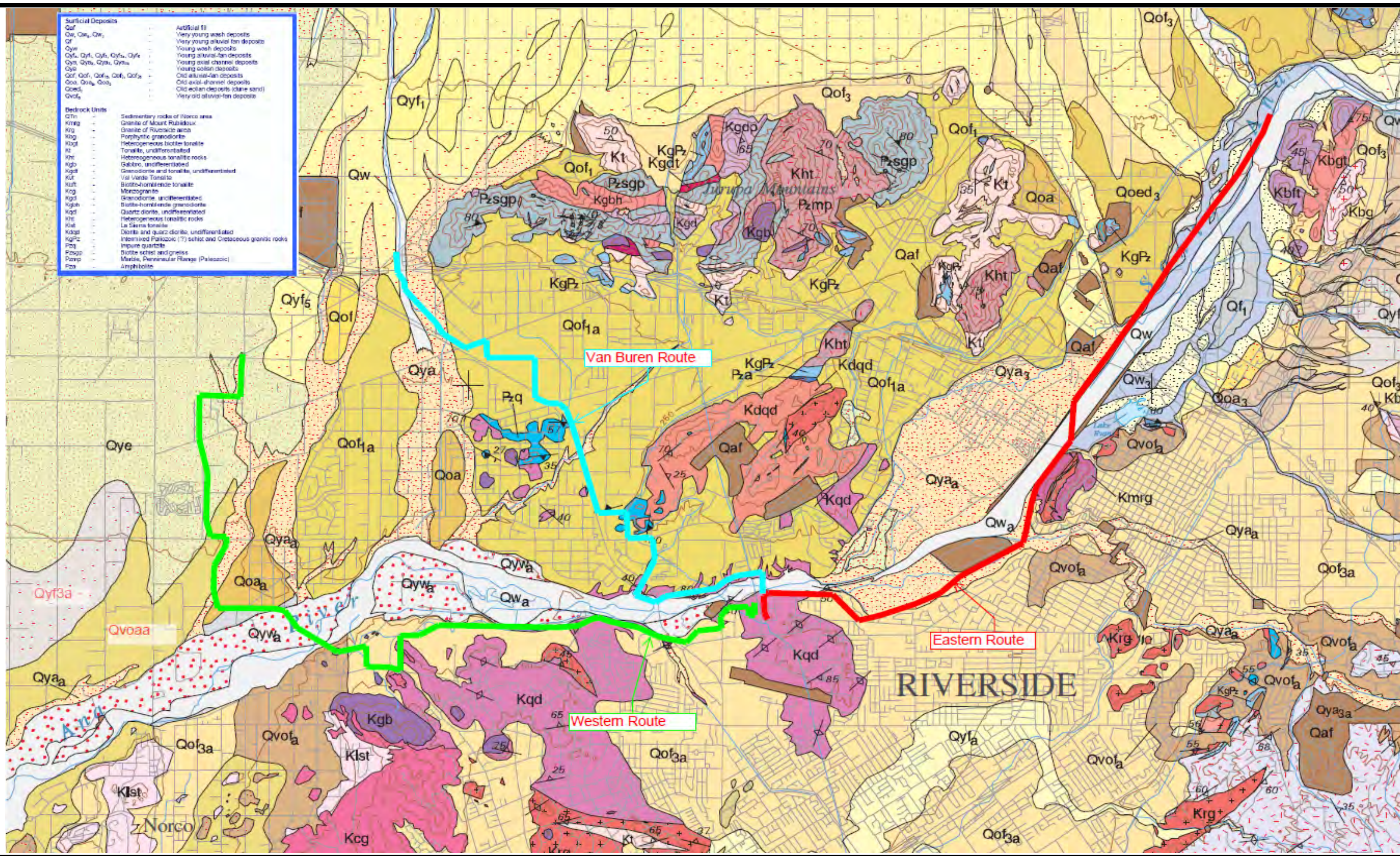
Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Western Route Location: Riverside County, CA	Source: Google Earth
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **2b**

Van Buren Route Layout Map

Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Van Buren Route Location: Riverside County, CA	Source: Google Earth
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **3a**

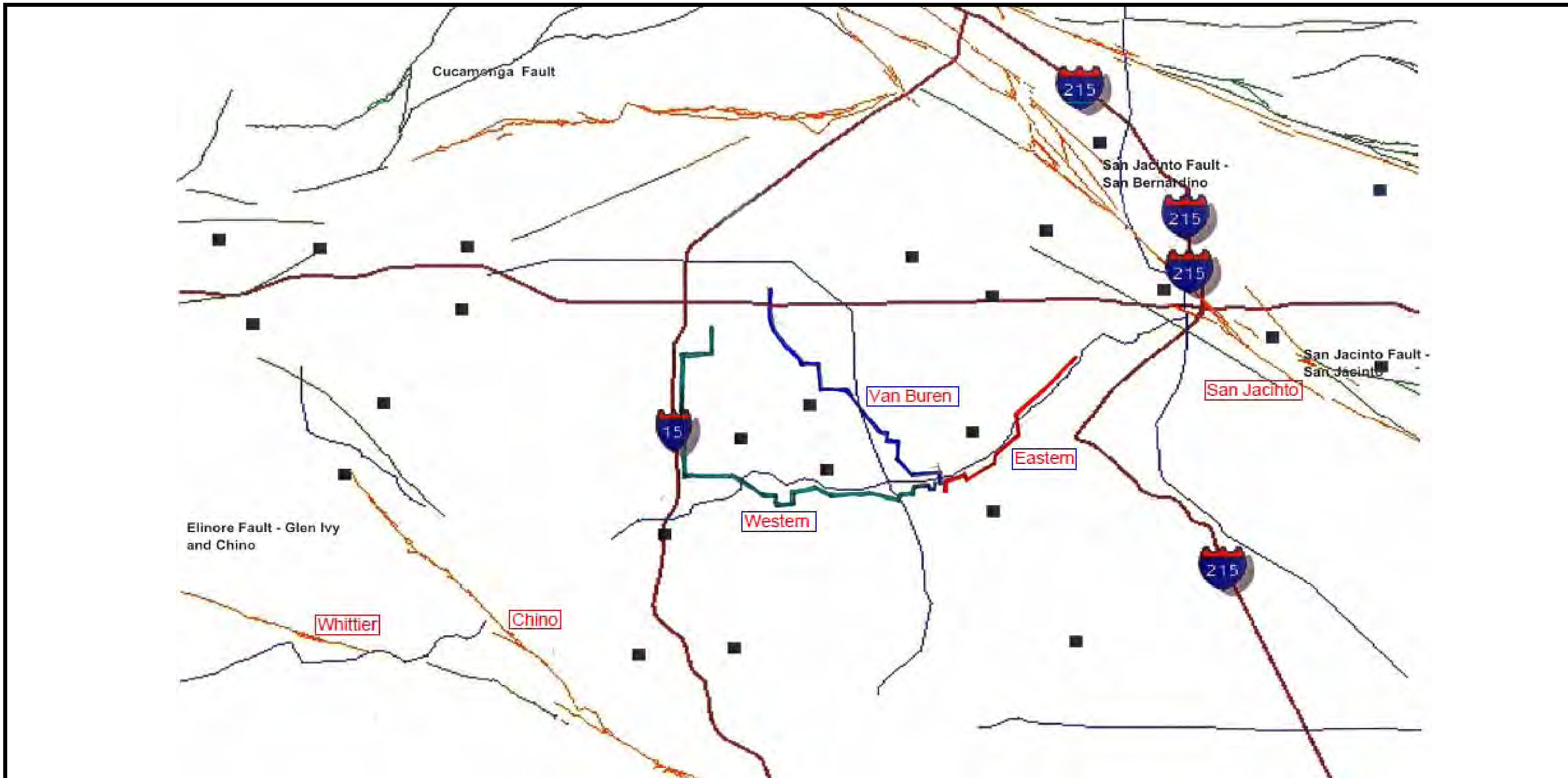
Van Buren Route Layout Map

Project Name: Riverside Transmission Reliability Project 230kV (RTRP), Van Buren Route Location: Riverside County, CA	Source: Google Earth
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **3b**



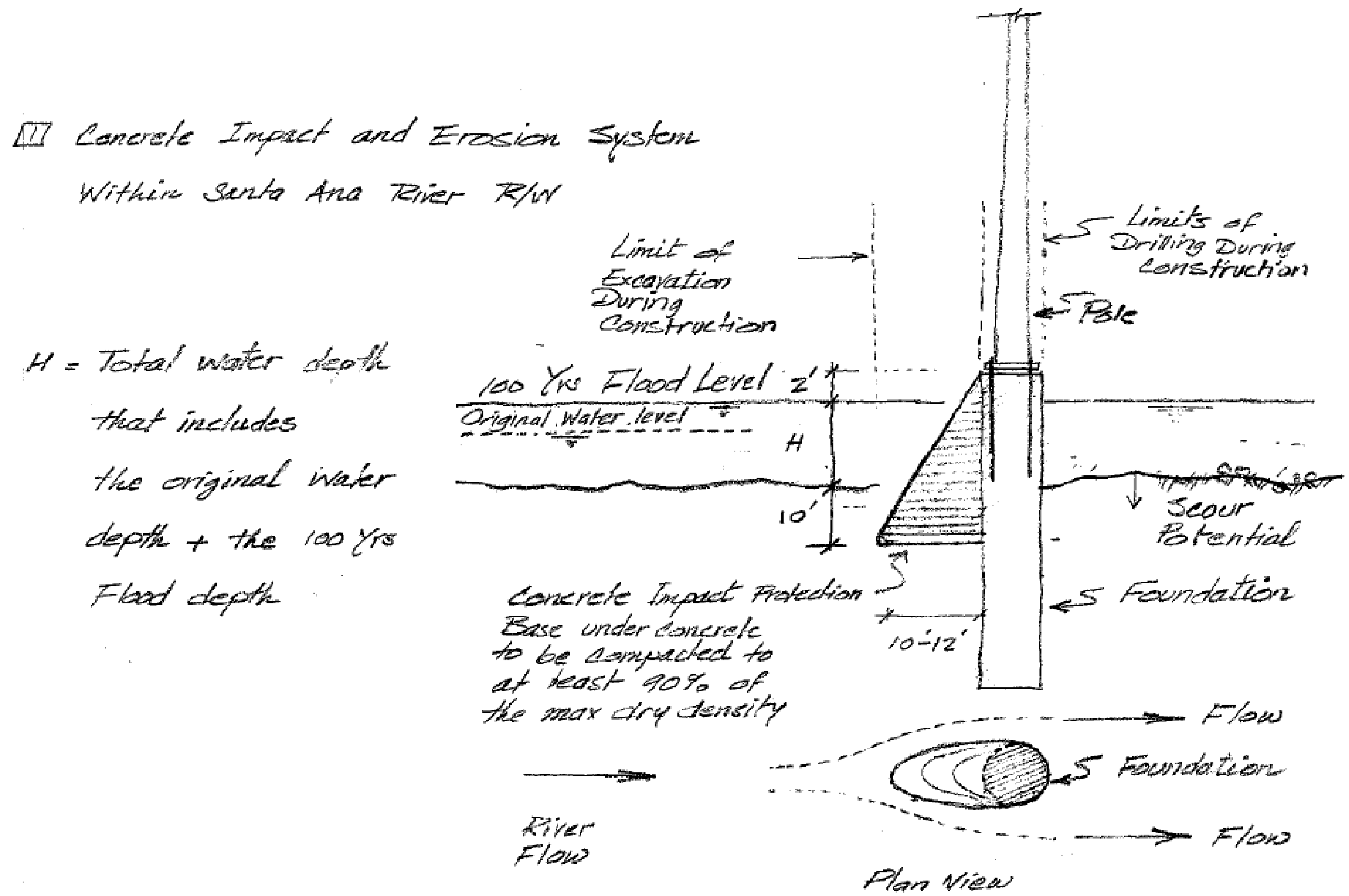
Regional Geologic Map With Proposed Eastern, Western and Van Buren Routes

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source:
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **4**



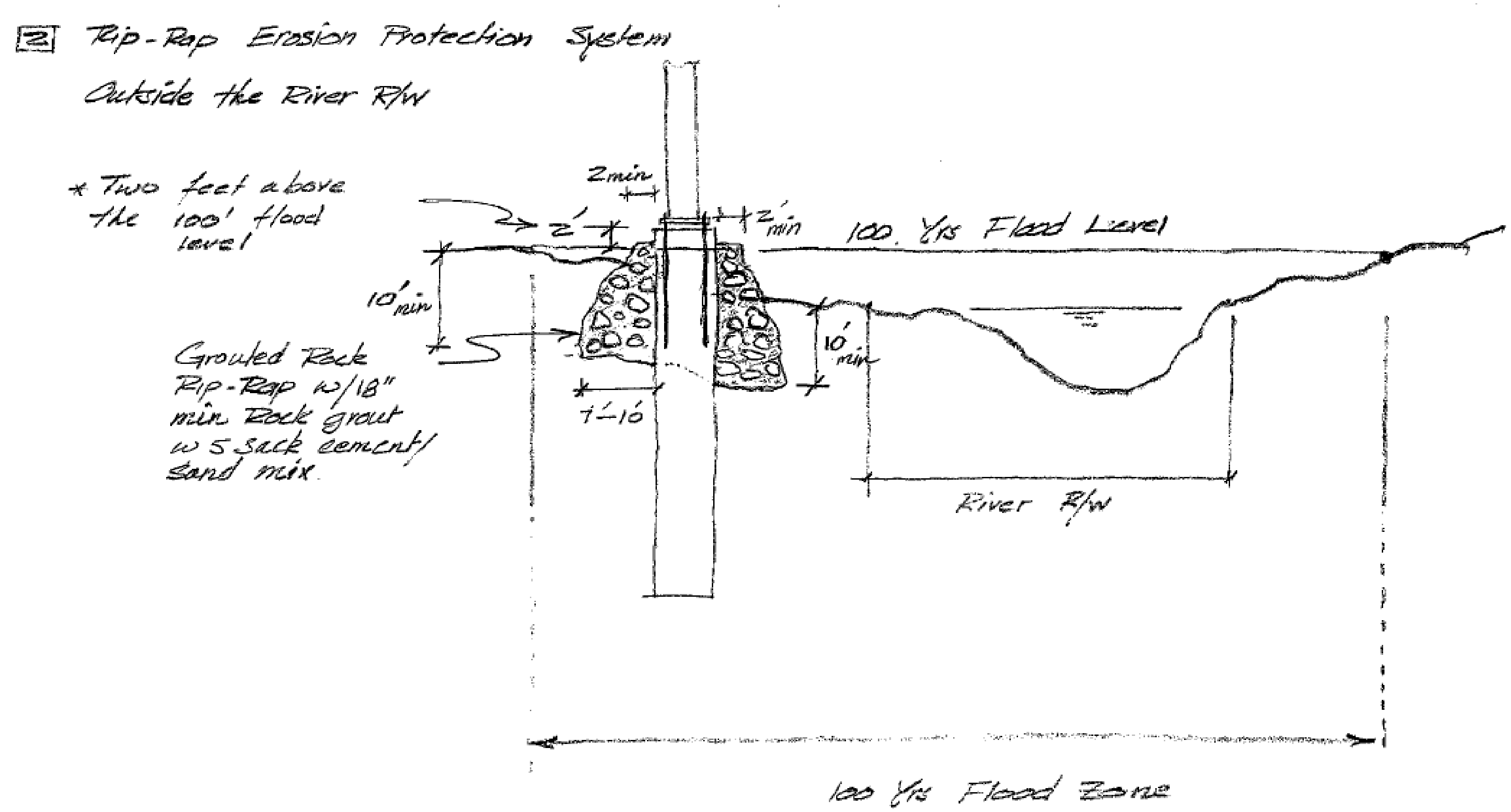
Faulting & Local Seismicity Map

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **5**



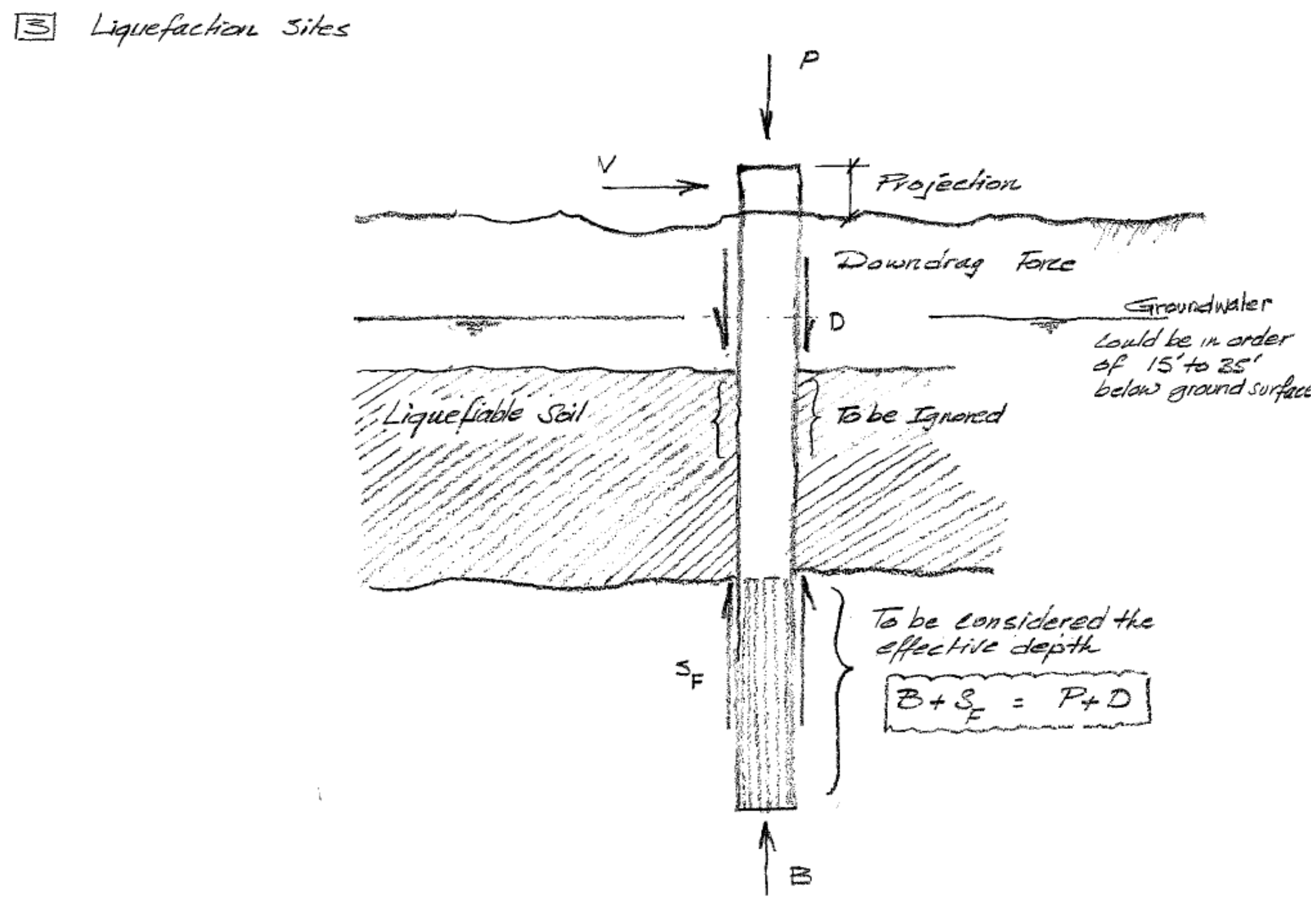
Concrete Impact and Erosion System Within Santa Ana River R/W

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE drawing
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **6**



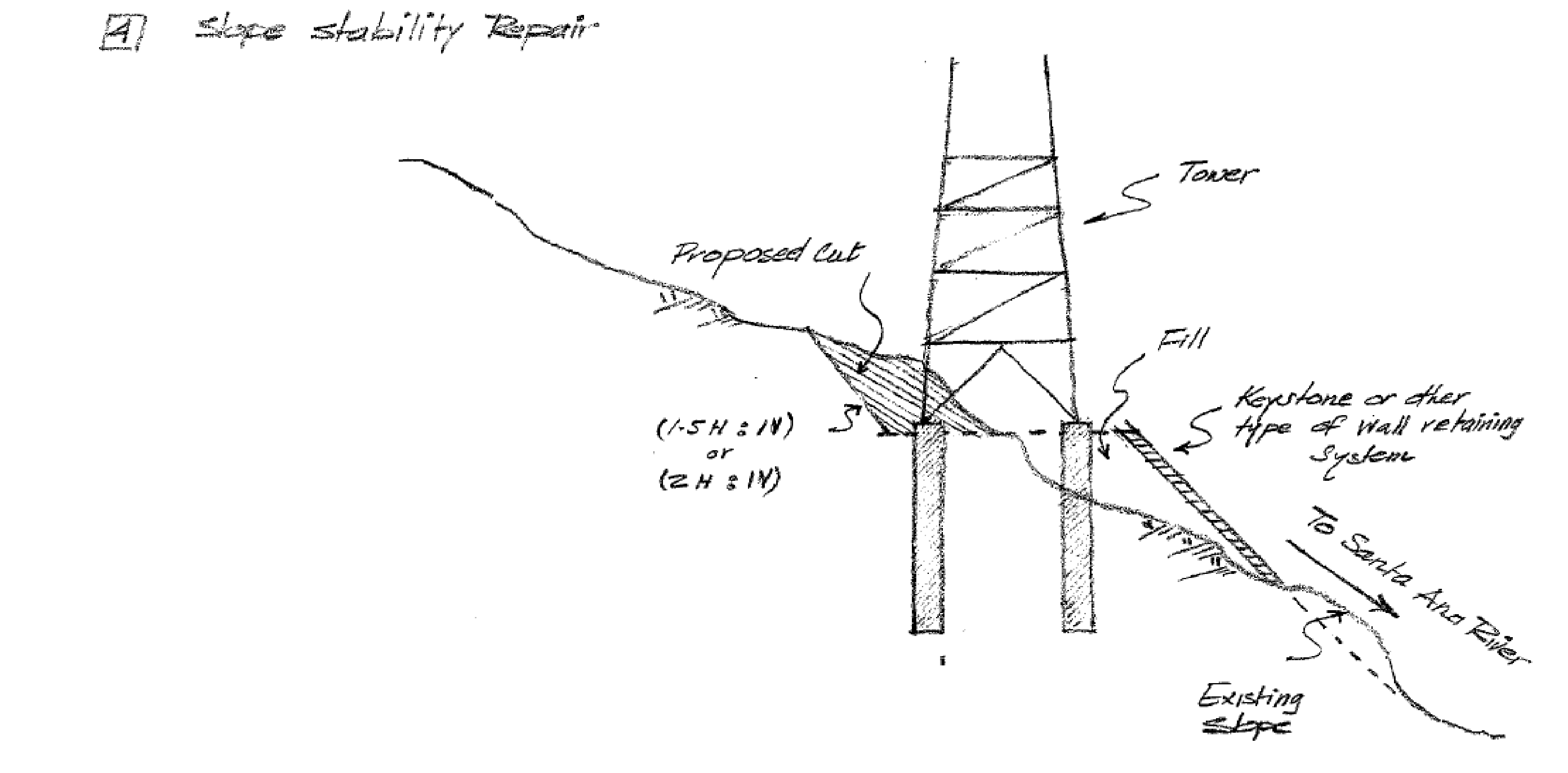
Rip-Rap Erosion Potection System

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE drawing
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **7**



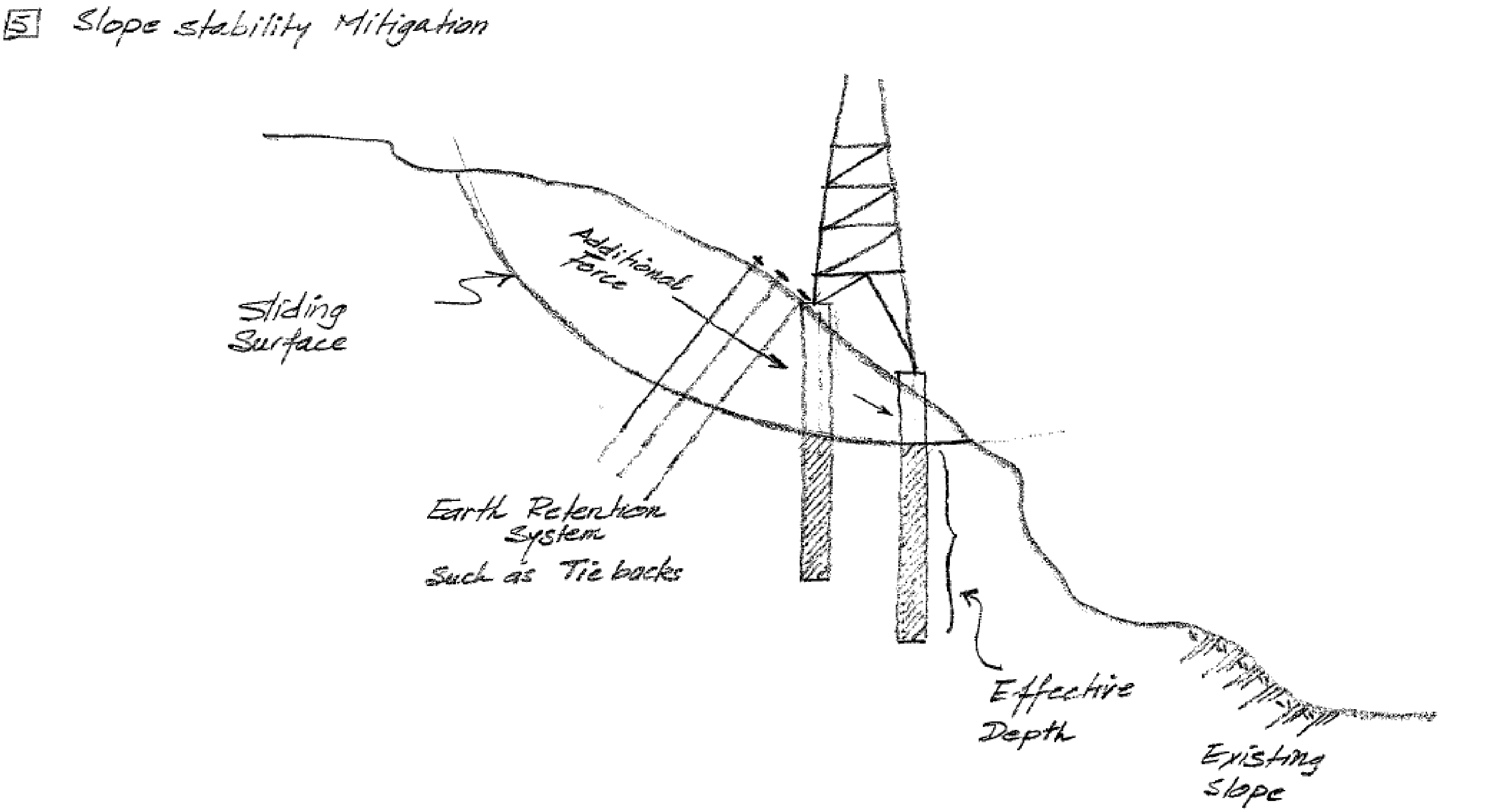
Liquefaction Sites

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE drawing
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **8**



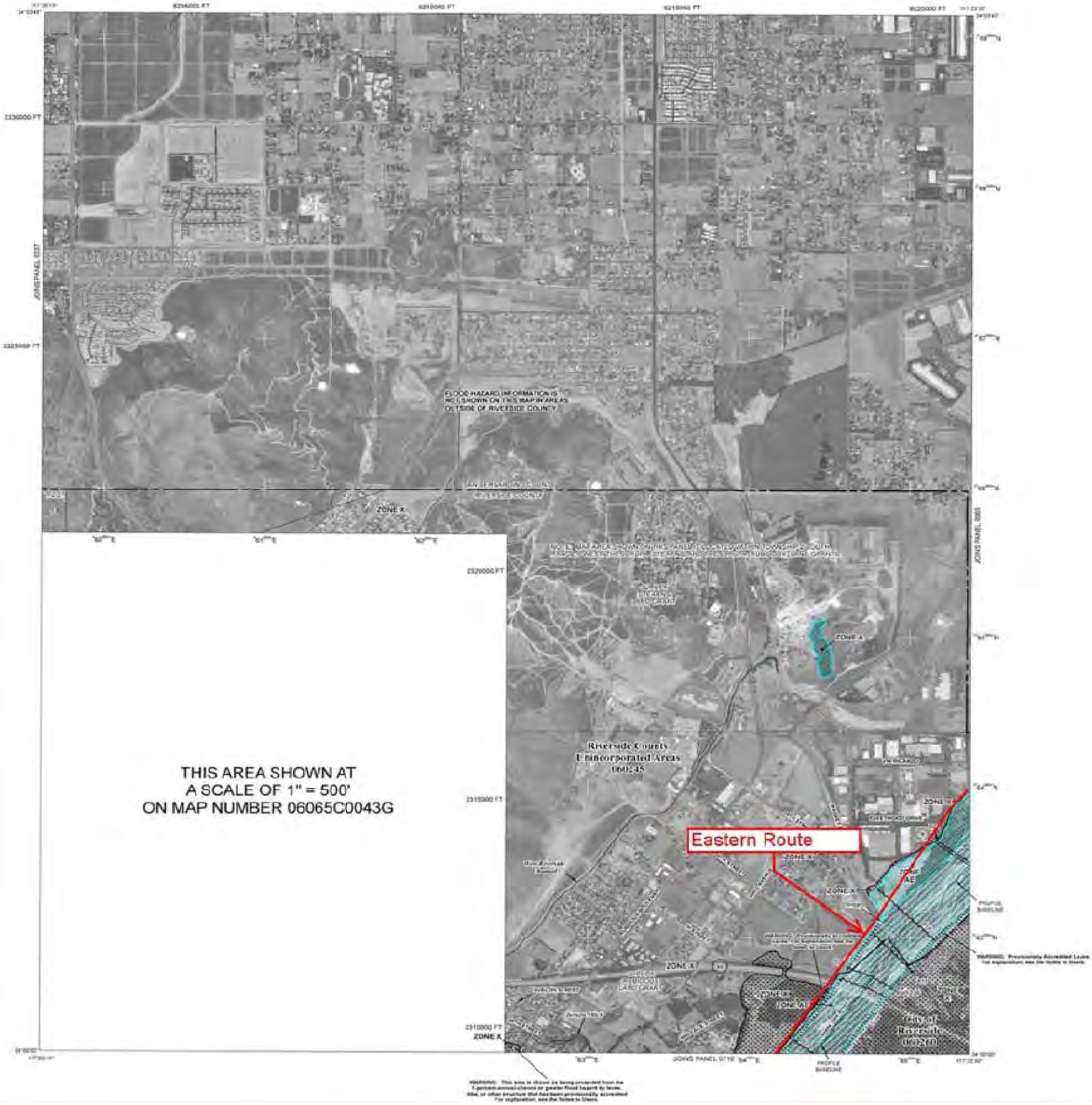
Slope Stability Repair

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE drawing
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **9**



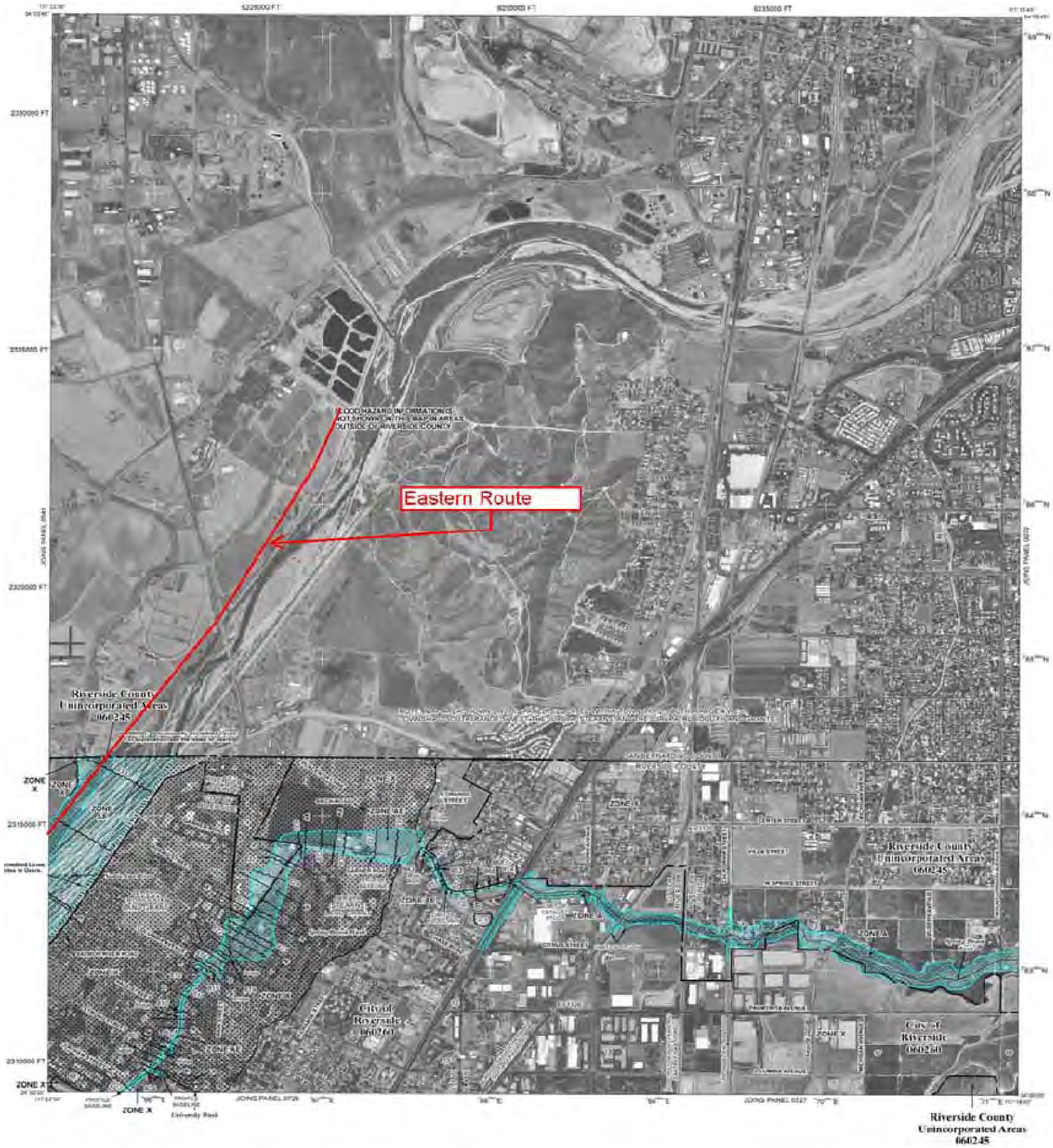
Slope Stability Mitigation

Project Name: Riverside Transmission Reliability Project (RTRP) Location: Riverside County, CA	Source: SCE drawing
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **10**



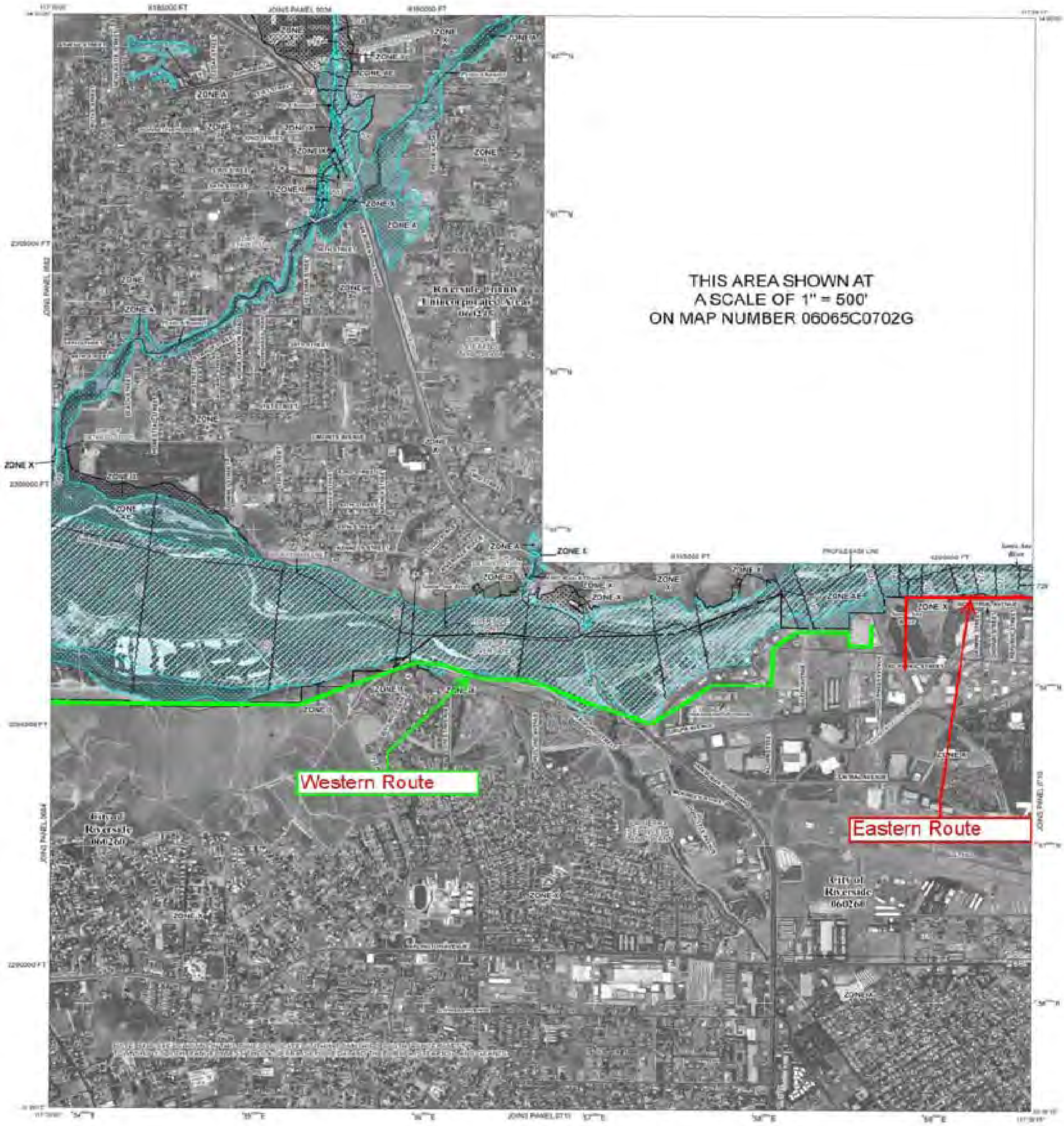
FEMA Map Eastern Route

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: FEMA
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **11**



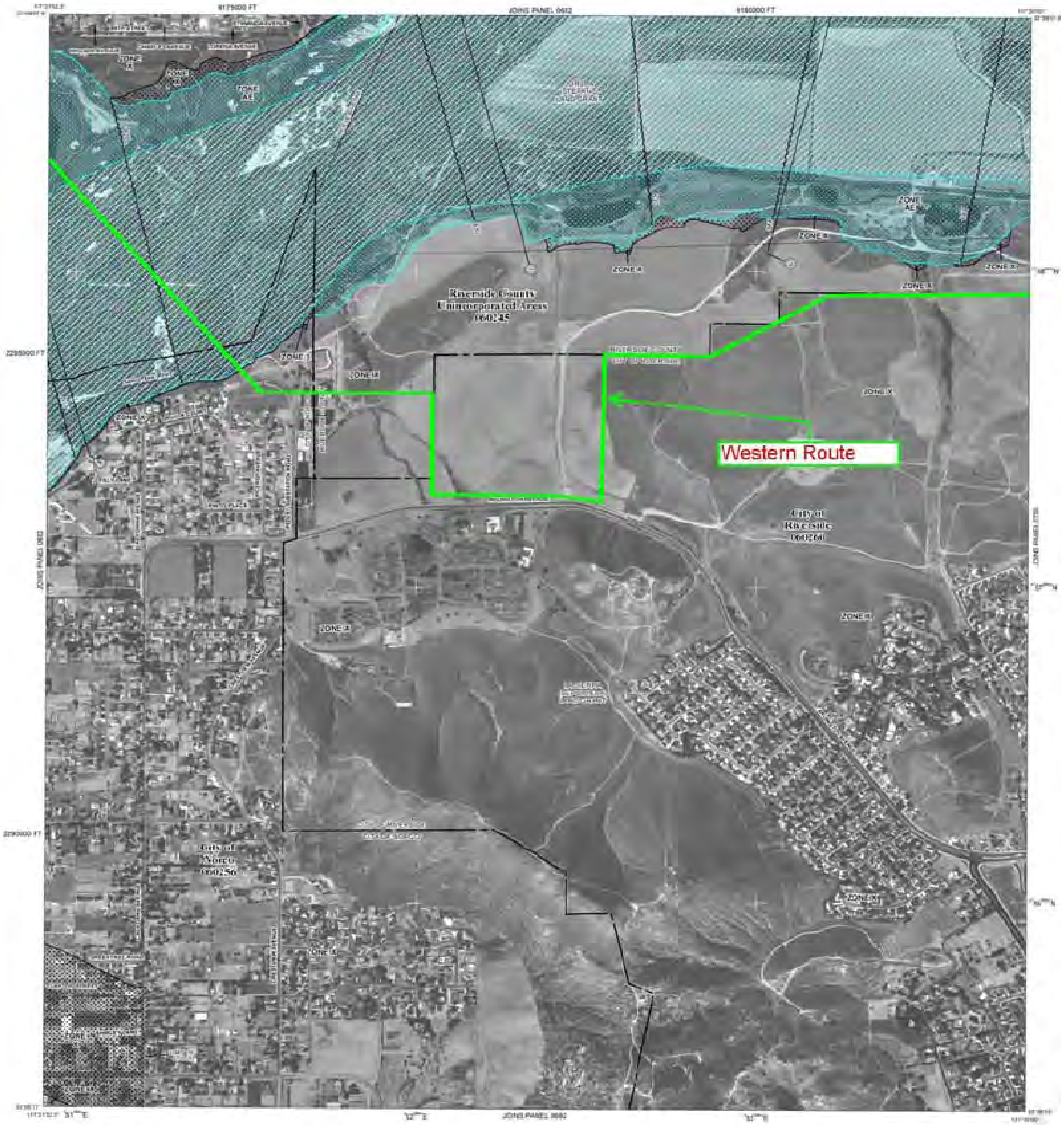
FEMA Map Eastern Route

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: FEMA
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **12**



FEMA Map Eastern and Western Route

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: FEMA
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **13**



FEMA Map Western Route

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: FEMA
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **14**

Banning

Banning

Erosion

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **15**

TSP M9-P5
Borrego-Chiquita 66kV T/L

TSP M9-P5
Borrego-Chiquita 66kV T/L

Erosion

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **16**

M8-P6 Borrego-Chiquita T/L

M8-P6 Borrego-Chiquita T/L

Erosion

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **17**

Erosion Repair

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **18**

Midway-Vincent 500KV T/L M76-T1
Rotational Slide

Pardee-Pastoria M196-T4

Slope Instability

Project Name: Riverside Transmission Reliability Project 230kV (RTRP) Location: Riverside County, CA	Source: SCE
TDBU Civil/Structural & Geotechnical Engineering Group	Figure No. **19**

Moorpark-Pardee 220 kV

Moorpark-Pardee 220 kV

Slope Instability

Project Name: Riverside Transmission Reliability Project 230kV (RTRP)

Location: Riverside County, CA

Source: SCE

TDBU Civil/Structural & Geotechnical Engineering Group

Figure No. 20

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

Photo 15

Photo 16

Photo 17

Photo 18

Photo 19

Photo 20

Photo 21

Photo 22

Photo 23

Photo 24

Photo 25

Photo 26

Photo 27

Photo 28

Photo 29

Photo 30


1
2
AX2
AX3
3
AX5
AX4
AX1
4
Western Route
BX1
Wildlife Sub
5
Eastern Route
Van Buren Route

Photo 31


1
2
AX2
AX3
3
AX4
AX5
AX1
4
BX1
Western Route
5
Wildlife Sub
Eastern Route
Van Buren Route

Photo 32

Photo 33

Photo 34

Photo 35

Photo 36

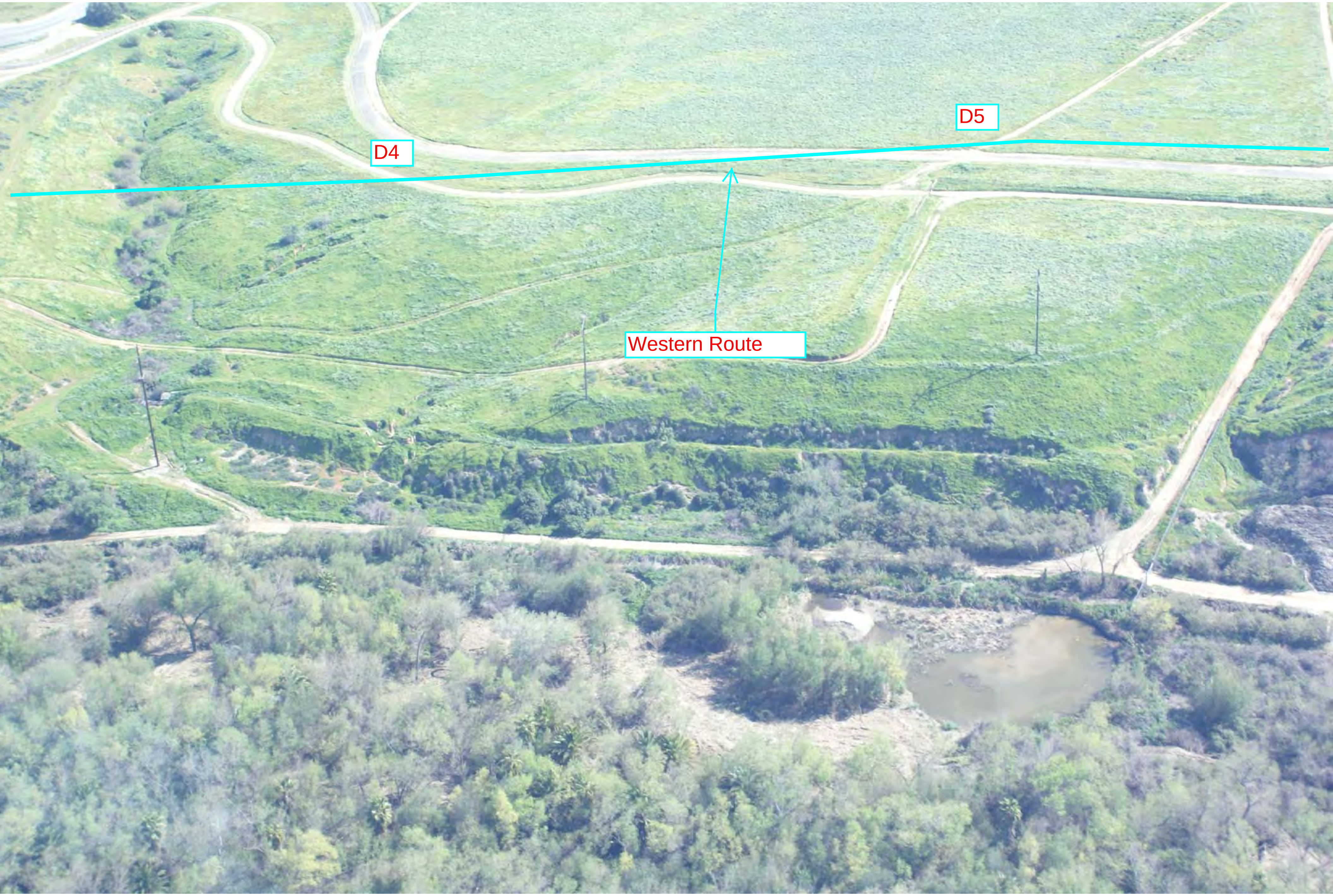


Photo 37

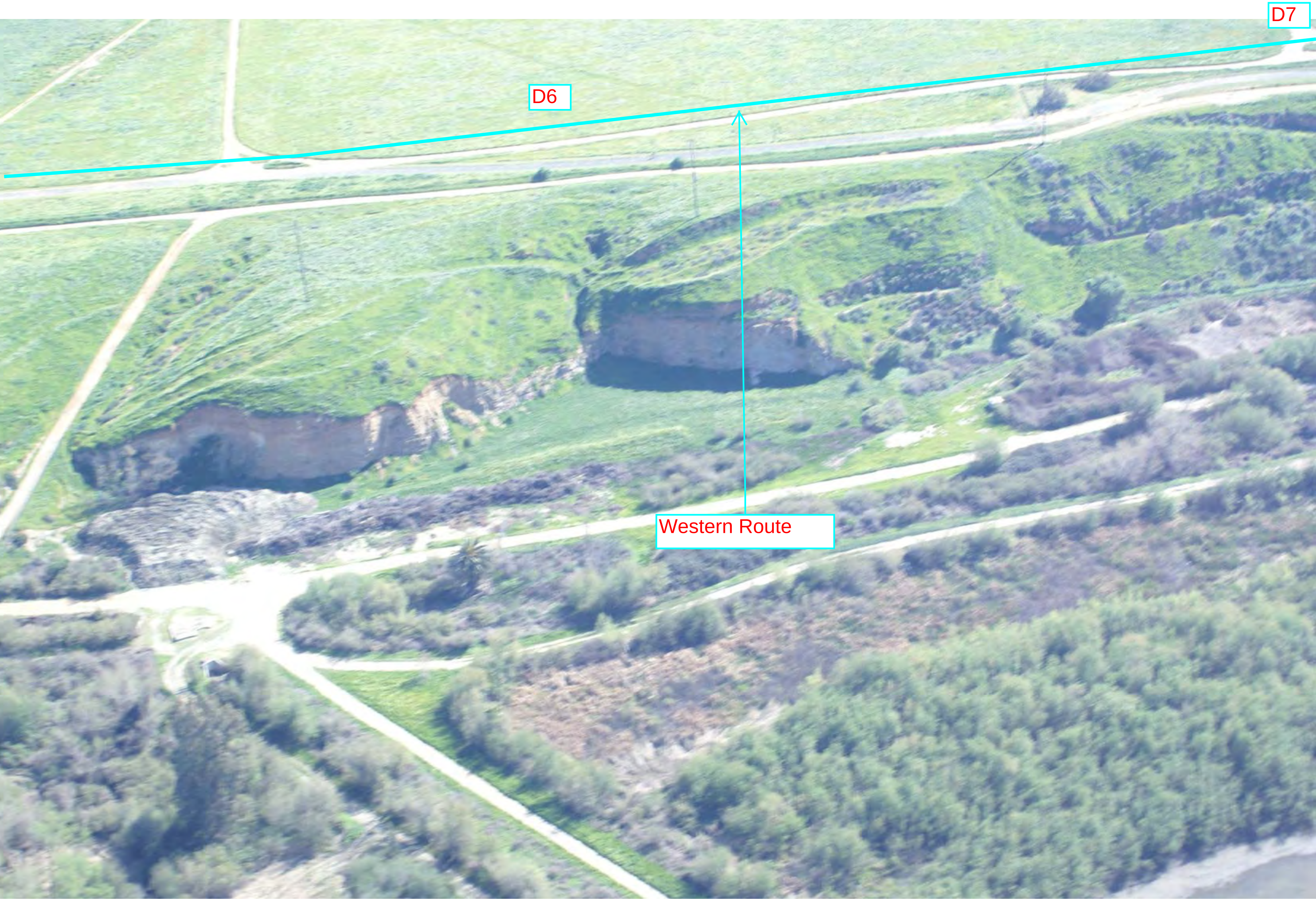


Photo 38

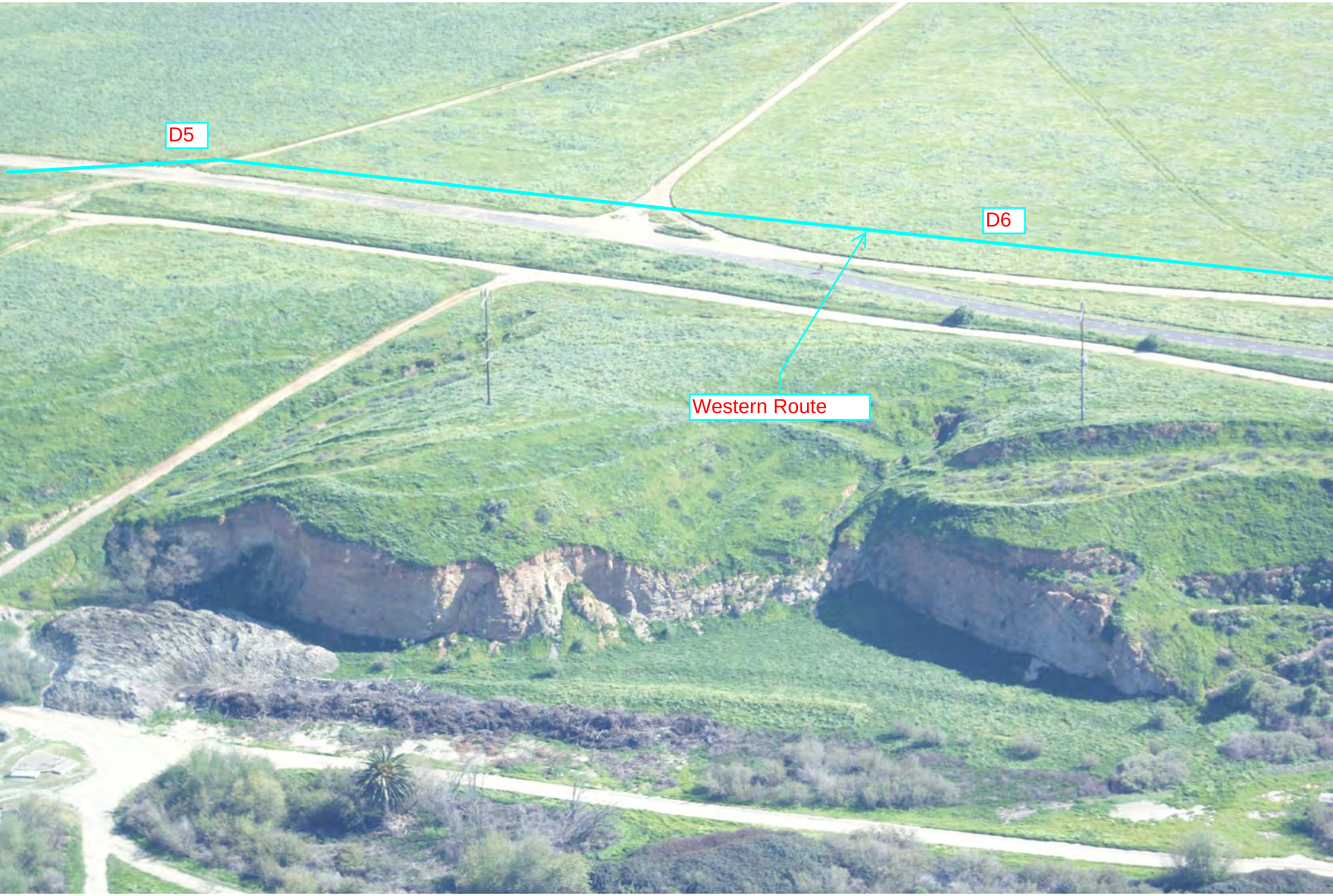


Photo 39

Photo 40

Photo 41

Photo 42

Photo 43

Photo 44

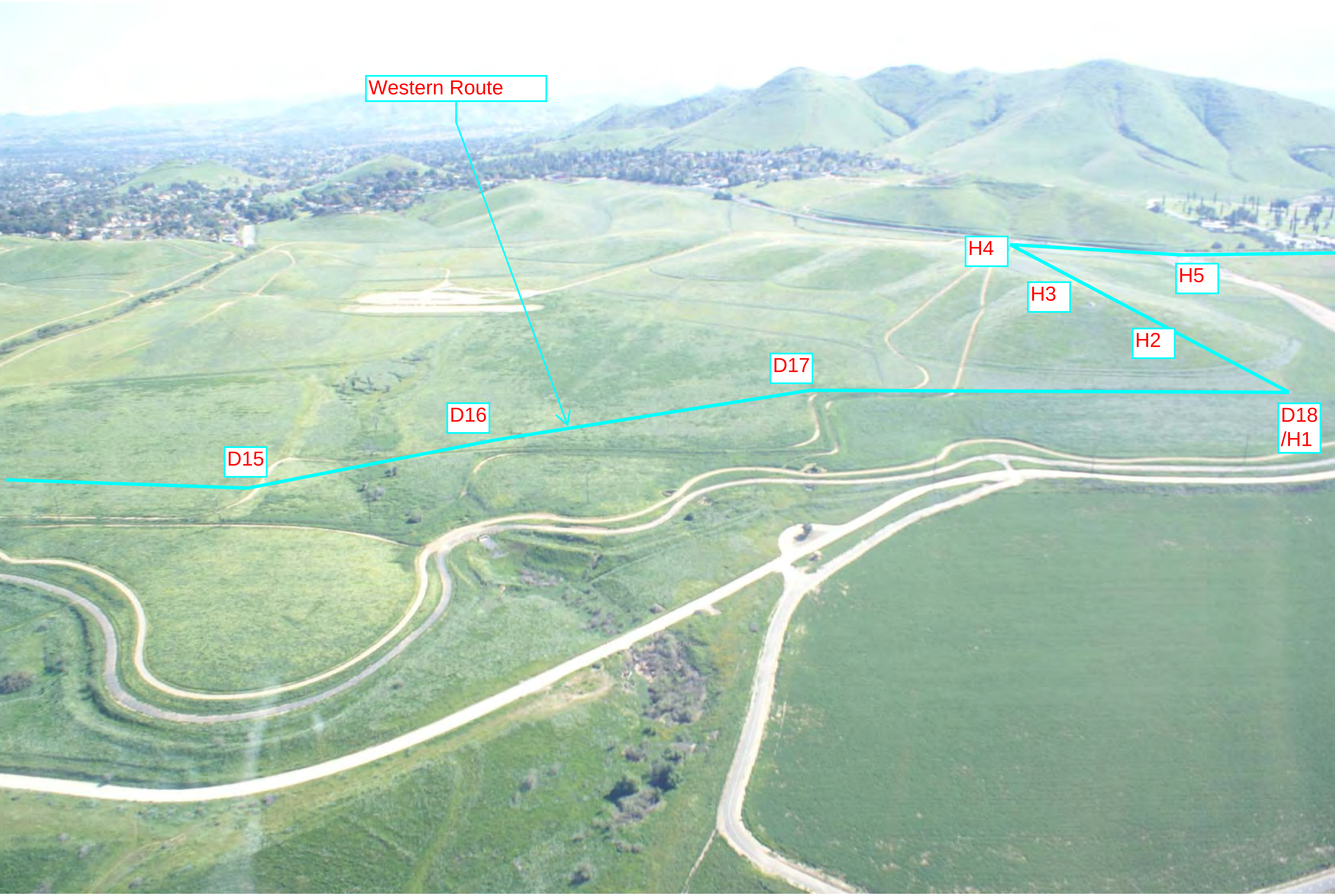


Photo 45

Photo 46

Photo 47

Photo 48

Photo 49

Photo 50

Photo 51

Photo 52

Photo 53

Photo 54


JB6
JB7
JB8/
JD1
JD2
JD3
JD4
Western Route
JD5
JD6
JD7
JD8
JD9
JD10

Photo 55

Photo 56

May 17, 2010

Subject: **Addendum to the Preliminary Geology and Geotechnical Evaluation Report**
Riverside Transmission Reliability Project (RTRP)

Reference: **Preliminary Geology and Geotechnical Evaluation Report**
Riverside Transmission Reliability Project (RTRP)
Double Circuit 230kV T/L
Eastern, Western and Van Buren Suggested Routes
Mira Loma - Vista #1 230kV to Wildlife Substation
Riverside County, California.
Dated April 2, 2010

Project No. 10-037

This addendum was prepared to summarize the findings provided in the reference report. A master table that includes the outcome of the evaluation is included in this addendum. The referenced report only included towers that are located in and or within Santa Ana River and its premises. The attached table includes all the towers included in each route to provide a more comprehensive comparison.

The route evaluation is only based on a desktop study as no subsurface exploration has been conducted. The route description is provided in section 2 of the reference report. The number of impacted towers is approximate and is used as a guidance to provide data to select the appropriate route from the licensing, construction and maintenance standpoint. The assessment only considers four critical geotechnical and geology concerns that are common to occur within this geological formation as addressed in sections 3, 4 and 5 of the referenced report. These four concerns are Liquefaction, Flood potential, Erosion and Slope instability impact (refer to sections 6, 7, 8 and 9 for more details.)

The attached master table indicates that approximately 23 out of 70 towers are unaffected in the Eastern route (33%). The Western and Van Buren include 65 out of 82 (79%) and 49 out of 60 (82%) respectively. Some of the impacted towers have single impact others have dual or triple impact. For instance, the 57 impacted towers in the eastern include 8 single, 12 dual and 27 triple impacts. On the other hand, there are 24 towers impacted by liquefaction. Also there are 40, 43 and 6 towers impacted by flood, erosion and slope instability respectively. The master table includes details regarding the impacted towers in the Western and Van Buren routes.

The liquefaction impact is categorized into four categories - Not Applicable, Low, Evaluate and Graded. We only considered the category Evaluate as the impacted towers for liquefaction potential. The other geology/geotechnical impact considered only the 100 year flood zone category and medium & high ratings in case of erosion and slope instability.

The construction, Access Roads and Foundation Top Elevation within the 100 year flood zone concerns are discussed in sections 11, 12, and 13. Proposed structure locations were assessed in terms of difficulty of construction, maintaining access routes and level pads appropriate to accommodate vehicles/trucks normally anticipated to be needed during construction. Access roads are required for maintenance purposes and emergency situations over the lifetime of the structures. The available options were addressed. Several structures will either be located in the riverbed or adjacent to the riverbed with unprotected banks and within the 100 year flood zone. The master table provides the same tables that were included in the referenced report but updated to address all the towers in the entire alignment not just the riverbed.

A “100 year flood event” measure was used as one of the basis of the data impacts. Some if not all of these impacts could be of concern at lower flood return periods.

Eastern		Geotechnical Conditions				Impact per Tower			
	Str. #/Str. Name	*Liquefaction*	*100 Year Flood Zone*	*Erosion*	*Slope Instability*	*Single*	*Dual*	*Triple*	*Unaffected*
Total Structures		70				8	12	27	23
	Total	24	40	43	6				
	Percentage	34%	57%	61%	9%				
Total unaffected									**33%**
	1								1
	2								1
	3								1
	4								1
	5								1
	6			Y		1			
	7			Y		1			
	8								1
	9				Y	1			
	10			Y	Y		1		
	11								1
	12								1
	13								1
	14			Y		1			
	15		Y	Y			1		
	16		Y	Y			1		
	17		Y	Y			1		
	18	Y	Y	Y				1	
	19	Y	Y	Y				1	
	20	Y	Y	Y				1	
	21	Y	Y	Y				1	
	22	Y	Y	Y				1	
	23	Y	Y	Y				1	
	24	Y	Y	Y				1	
	25	Y	Y	Y				1	
	26	Y	Y	Y				1	
	27	Y	Y	Y				1	
	28	Y	Y	Y				1	
	29	Y	Y	Y				1	
	30			Y		1			
	31								1
	32		Y	Y			1		
	33								1
	34								1
	35		Y			1			
	36								1
	37								1
	38								1
	39								1
	40								1
	41		Y			1			
	42		Y			1			
	43								1
	44								1
	45								1
	46								1
	47								1
	48								1
	49		Y	Y			1		
	50		Y	Y			1		

Western		Geotechnical Conditions				Impact per Tower			
Str. #	Str. Name	*Liquefaction*	*100 Year Flood Zone*	*Erosion*	*Slope Instability*	*Single*	*Dual*	*Triple*	*Unaffected*
Total Structures		82				4	12	1	65
	Total	0	5	13	13				
	Percentage	0%	6%	16%	16%				
Total unaffected									**79%**
1	AX1								1
2	AX2								1
3	AX3								1
4	AX4								1
5	AX5								1
6	AX6								1
7	AX7								1
8	AX8								1
9	AX9								1
10	AX10								1
11	AX11								1
12	AX12								1
13	AX13								1
14	AX14			Y	Y		1		
15	AX15		Y	Y	Y			1	
16	AX16			Y	Y		1		
17	AX17			Y	Y		1		
18	AX18			Y	Y		1		
19	AX19			Y	Y		1		
20	AX20			Y	Y		1		
21	AX21/D1			Y	Y		1		
22	D2								1
23	D3								1
24	D4								1
25	D5								1
26	D6			Y	Y		1		
27	D7			Y	Y		1		
28	D8			Y	Y		1		
29	D9			Y	Y		1		
30	D10			Y	Y		1		
31	D11								1
32	D12								1
33	D13								1
34	D14								1
35	D15								1
36	D16								1
37	D17								1
38	D18/H1								1
39	H2								1
40	H3								1
41	H4								1
42	H5								1
43	H6								1
44	H7								1
45	H8								1
46	H9								1
47	H10								1
48	H11/JA1								1
49	JA2/JB1		Y			1			
50	JB2		Y			1			

Van Buren		Geotechnical Conditions				Impact per Tower			
Str #	Str. Name	*Liquefaction*	*100 Year Flood Zone*	*Erosion*	*Slope Instability*	*Single*	*Dual*	*Triple*	*Unaffected*
Total Structures		60				5	5	1	49
	Total	3	9	3	3				
	Percentage	5%	15%	5%	5%				
Total unaffected									**82%**
1	BX1		Y			1			
2	BX2								1
3	BX3		Y			1			
4	BX4		Y			1			
5	BX5		Y			1			
6	BX6								1
7	BX7		Y			1			
8	BX8		Y		Y		1		
9	BX9		Y		Y		1		
10	BX10		Y		Y		1		
11	BX11	Y		Y			1		
12	BX12	Y		Y			1		
13	BX13/L1	Y	Y	Y				1	
14	L2								1
15	L3/N1								1
16	N2								1
17	N3								1
18	N4								1
19	N5								1
20	N6								1
21	N7								1
22	N8/Q1								1
23	Q2								1
24	Q3								1
25	Q4								1
26	Q5								1
27	Q6/R1								1
28	R2								1
29	R3								1
30	R4								1
31	R5								1
32	R6								1
33	R7								1
34	R8								1
35	R9								1
36	R10								1
37	R11								1
38	R12								1
39	R13								1
40	R14								1
41	R15								1
42	R16								1
43	R17								1
44	R18								1
45	R19								1
46	R20								1
47	R21								1
48	R22								1
49	R23								1
50	R24								1

Updated Tables from "Preliminary Geology and Geotechnical Evaluation" April 2, 2010

Liquefaction Rating	Number of Structures & [Structure Numbers]		
	Eastern Route	Western Route	Van Buren Route
NA	20	73	57
L	11	9	0
E	24 [68,18-29, 56-59, 62-66, & 69-70]	0	3 [BX11- BX13]
G	15 [38-39, 67,40-49, & 60-61]	0	0

NA: *Not Applicable:* Materials Underlying the proposed structure locations are not susceptible to liquefaction. No analysis required.
L: *Low:* Materials underlying the proposed structure are expected to be moderately consolidated and to have a relatively low potential for liquefaction. Analyses of representative areas should be considered.
E: *Evaluate:* Materials underlying the proposed structure location are expected to include fine-grained granular material that is poorly consolidated. A potential for liquefaction during seismic loading under high groundwater conditions Is considered likely. Specific analyses of each proposed tower location should considered.
G: *Graded:* The structure is proposed within or near an area that has been graded or otherwise improved. Evaluation/mitigation may not be necessary or feasible.

Flood Zone	Number of Structures & [Structure Numbers]		
	Eastern Route	Western Route	Van Buren Route
100 Year Flood	40 [15-29, 32, 35, 41-42, 49-53, 55-70]	5 [AX15, & JB1-JB4]	9 [BX1, BX3-5, BX7-10, & BX13]
500 Year Flood	7	0	2
Outside 500 Year Flood	23	77	49

Erosion Rating	Number of Structures & [Structure Numbers]		
	Eastern Route	Western Route	Van Buren Route
NA	0	27	48
L	27	42	9
M	25 [6-7, 10, 14-16, 26-30, 32, 52, 54, 55, & 61-70]	13 [AX14- AX21, D6-D10]	0
H	18 [17-25, 49-51, 53, & 56-60]	0	3 [BX11 - BX13]

NA: *Not applicable:* Structure locations are not susceptible to erosion
L: *Low:* Materials underlying the proposed structure location are expected to be generally non-erodible, given proper drainage control or the site is elevated with limited upslope catchment area.
M: *Medium:* Materials underlying the proposed structure location are expected to include materials readily susceptible to erosion; drainage in the surrounding area is poor, the site is located within either the 100-year or 500-year flood plain, but near the margins of the drainage channel.
H: *High:* The structure is proposed within or near the main floodway; site observations noted evidence of periodic flooding (existing damage that appears to be flood related, past repairs, piles of flood debris in the vicinity.

Slope Instability Rating	Number of Structures & [Structure Numbers]		
	Eastern Route	Western Route	Van Buren Route
NA	0	27	51
L	64	42	6
M	2 [9-10]	13 [AX14- AX21, & D6-D10]	3 [BX8 - BX10]
H	4 [52-55]	0	0

NA: *Not applicable:* Structure locations are not susceptible to slope instability
L: *Little:* Little or no slope stability risk anticipated. Primarily identified for structure proposed on flat sites, at significant distances from slopes, or where underlying conditions are such that no significant risk is expected associated with nearby slopes. Specific slope stability analyses are not considered warranted.
M: *Medium:* Some elements of slope stability risk is anticipated; however, the risk is considered wither primarily nuisance level, easily mitigated, or not of immediate concern. The potential for some slope stability risk should be considered in the design and planning process, possibly supported by specific slope stability analysis. The need for mitigation measures is considered low.
H: *High:* Conditions at the structure locations require careful analysis of slope stability issues. Some degree of mitigation is anticipated.

Preliminary Geological Condition Impact Evaluation
MASTER TABLE

Project Name: Riverside Transmission Reliability Project
230 kV (RTRP) - 2010-037
Location: Riverside County, CA

TDBU **Geotechnical Engineering Group**

Eastern		Geotechnical Conditions				Impact per Tower			
	Str. #/Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
	51		Y	Y			1		
	52		Y	Y	Y			1	
	53		Y	Y	Y			1	
	54			Y	Y		1		
	55		Y	Y	Y			1	
	56	Y	Y	Y				1	
	57	Y	Y	Y				1	
	58	Y	Y	Y				1	
	59	Y	Y	Y				1	
	60		Y	Y			1		
	61		Y	Y			1		
	62	Y	Y	Y				1	
	63	Y	Y	Y				1	
	64	Y	Y	Y				1	
	65	Y	Y	Y				1	
	66	Y	Y	Y				1	
	67		Y	Y			1		
	68	Y	Y	Y				1	
	69	Y	Y	Y				1	
	70	Y	Y	Y				1	
Total Structures		70				8	12	27	23
	Total	24	40	43	6				
	Percentage	34%	57%	61%	9%				
Total unaffected									33%
	Str. #/Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
Eastern		Geotechnical Conditions				Impact per Tower			

Western		Geotechnical Conditions				Impact per Tower			
Str. #	Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
51	JB3		Y			1			
52	JB4		Y			1			
53	JB5								1
54	JB6								1
55	JB7								1
56	JB8/JD1								1
57	JD2								1
58	JD3								1
59	JD4								1
60	JD5								1
61	JD6								1
62	JD7								1
63	JD8								1
64	JD9								1
65	JD10								1
66	JD11								1
67	JD12								1
68	JD13								1
69	JD14								1
70	JD15								1
71	JD16								1
72	JD17								1
73	JD18								1
74	JD19								1
75	JD20								1
76	JD21								1
77	JD22								1
78	JD23								1
79	JD24								1
80	JD25								1
81	JD26								1
82	JD27								1
Total Structures		82				4	12	1	65
	Total	0	5	13	13				
	Percentage	0%	6%	16%	16%				
Total unaffected									79%
Str. #	Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
Western		Geotechnical Conditions				Impact per Tower			

Van Buren		Geotechnical Conditions				Impact per Tower			
Str #	Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
51	R25								1
52	R26								1
53	R27/S1								1
54	S2								1
55	S3								1
56	S4								1
57	S5								1
58	S6								1
59	S7								1
60	S8								1
Total Structures		60				5	5	1	49
	Total	3	9	3	3				
	Percentage	5%	15%	5%	5%				
Total unaffected									82%
Str #	Str. Name	Liquefaction	100 Year Flood Zone	Erosion	Slope Instability	Single	Dual	Triple	Unaffected
Van Buren		Geotechnical Conditions				Impact per Tower			

Preliminary Geological Condition Impact Evaluation
MASTER TABLE

Project Name: Riverside Transmission Reliability Project
230 kV (RTRP) - 2010-037
Location: Riverside County, CA

TDBU | Geotechnical Engineering Group

Appendix 4

Original RTRP Route Evaluation Matrix – 2009

RPU-RTRP
ROUTE EVALUATION PROCESS

SCE management, engineers, and subject matter experts evaluated the following proposed routes for the Riverside Public Utility - Riverside Transmission Reliability Project RPU-RTRP (Project):

- Van Buren Offset Route
- Western (I-15) Route
- Bain Street Route
- Eastern Route
- Original Van Buren Route

The main Project Objectives considered during the route evaluation process were:

- System Reliability and Operational Flexibility: Maintenance of adequate voltage levels along the T/L; providing a secondary source of connection to the grid which allows transfer of load between lines and substations in response to demand in order to reduce potential interruptions in service to customers; accessibility of structures for emergency repair and maintenance work
- Constructability: Includes factors such as the length of route; number and height of structures; civil work and engineering design requirement related to flooding and drainage patterns, soil conditions, and topography; accessibility of T/L structures during construction and maintenance; crossings of the T/L over various structures including existing utility lines, flood control channels, freeways, high pressure pipelines, and the Union Pacific Right of Way
- Impact to Private and Public Property: Minimizing impact to existing property, structures, and buildings, by strategically locating the T/L structures
- Environmental Impacts: Utilizing existing ROWs, previously disturbed land, the shortest feasible routes, and/or the strategic placement of structures in areas that minimize impact to biological and cultural resources, aesthetics, air quality, land use, recreation, transportation/ traffic, and population and housing
- Project Cost and Time: Minimizing cost and construction time

The Routes were further evaluated for the following factors:

- Aesthetics (line route distance, route location, number and height of poles)
- Hazards and hazardous materials
- Public services and utilities
- Current and planned local Land Use issues (recreation, transportation)
- Population and Housing issues (location of sensitive receptors such as senior centers, licensed child care centers, and hospitals)
- Public acceptance (community assessments, previous community outreach issues)
- Land availability (acquisition of public, commercial, residential property for structure placement)
- Accessibility for construction and maintenance of structures
- Number of crossings of highways, creeks, Union Pacific ROW, and existing electric lines
- Relocation of existing utility structures
- Telecommunications facilities
- Permitting time (biological)

A comparison of the five routes is presented in Table 1- Route Comparison. A comparison of the routes as related to meeting the project objectives is provided in Table 2- Project Objectives.

Following evaluation, SCE eliminated the Original Van Buren Route and the Eastern Routes due to incompatible land use issues, construction infeasibility and/or the potential for substantial environmental impact. The remaining three routes were ranked as follow, in order of preference (1 being most preferred and 3 being least preferred):

1- Bain Street Route

2- Van Buren Offset Route

3- Western (I-15) Route

TABLE 1
ROUTE COMPARISON

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
System Reliability					
Maintenance of Adequate Voltage Levels Along T/L	yes	yes	yes	yes	yes
Secondary Source of Grid Connection	yes	yes	yes	yes	yes
Ability to Transfer Load in Response to Demand	yes	yes	yes	yes	yes
Accessibility of Structures for Repair and Maintenance	yes	yes	yes	Yes	no
Constructability					
T/L Length	7.1 – 7.3 miles	7.1 – 7.5 miles	9.8 – 10.5 miles	8.4 – 8.8 miles	6.8 – 7 miles
# of T/L Structures	56 – 58	58 – 63	75 – 82	68 –70 (estimate)	50
Civil Work (Flood Protection)	• Elevated roads, pads and berms potentially subject to Army Corp. of Engineers' design requirements for construction of levees	• Elevated roads, pads and berms potentially subject to Army Corp. of Engineers' design requirements for construction of levees	• Elevated roads, pads and berms potentially subject to Army Corp. of Engineers' design requirements for construction of levees	• Extensive civil work for elevated roads/pads/berms, potentially subject to Army Corp. of Engineers' design requirements for levees	• Elevated roads, pads and berms potentially subject to Army Corp. of Engineers' design requirements for construction of levees
Soil for Elevated Roads and Pads (1,000 CY)	47	60	170	300	116
Concrete Riprap for Slope Erosion Protec. Structures (1,000 CY)	2.9	4	9.4	21	6.2
Re-compacted Fill at the Base of Elevated Roads (1,000 CY)	19	22	46	121	30.4

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
Constructability **(cont.)**					
Utility Crossings	• Pomona Fwy crossing • Flood Control crossings	• Pomona Fwy and other major road crossings • Flood Control and Union Pacific ROW crossings	• Major Santa Ana River crossing (T/L spanned 2500 ft)	• Santa Ana River crossings (T/L spanned twice: 1400 ft and 2000 ft)	• Santa Ana River crossing
Existing Structures	• Potential for relocation of existing SCE and City of Riverside distribution lines	• Potential for relocation of existing SCE and City of Riverside distribution lines	• Rework of existing structures at Pedley substation • Potential impact to wastewater treatment facility (east of Van Buren Blvd. and N. of Jurupa Ave.) • Vernola Shopping Center parking lot • Misc. planned and future developments	• Potential for relocation of existing SCE and City of Riverside distribution lines • Potential impact to wastewater treatment facility (south. of W. Agua Mansa Rd and E. Riverside Ave.)	• Incompatible Land Use for placement of SCE T/L structures on Union Pacific ROW • Potential impact to wastewater treatment facility (east of Van Buren Blvd. and N. of Jurupa Ave.)
Telecommunications	• Would install cable on new T/L	• Would install cable on new T/L	• Requires approximate 1600 ft of undergrounding	• Would install cable on new T/L	• Would install cable on new T/L
Miscellaneous		• Numerous turns in the T/L, requiring dead-end structures with customized engineering designs, as well as large pulling areas (approx 100' X 300') at each turn			

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
Property Impacts					
CRE Rights	• Santa Ana River-Land and Water Conservation Fund Sites • Private property (commercial) • National Park Service • Riverside County Regional Park and Open Space District • Riverside County Flood Control ROW • Potential Army Corp of Engineers jurisdiction	• Santa Ana River-Land and Water Conservation Fund Sites • Private property (commercial, residential) • National Park Service • Riverside County Regional Park and Open Space District • Riverside County Flood Control ROW • Other County owned • UP ROW crossings • Potential Army Corp of Engineers jurisdiction	• Santa Ana River and Hidden Valley Wildlife Area - Land and Water Conserv. Fund Sites • Private property (commercial, residential) • National Park Service • CA State Parks- CA Dept. of Fish and Game • Riverside County Regional Park and Open Space District • County/City wastewater treatment facility • Potential Army Corp of Engineers jurisdiction	• Santa Ana River and Hidden Valley Wildlife Area - Land and Water Conservation Fund Sites • Private property (commercial, residential) • National Park Service • CA State Parks- CA Dept. of Fish and Game • Riverside County Regional Park and Open Space District • County/City wastewater treatment facility • Potential Army Corp of Engineers jurisdiction (Fleetwood Market St.)	• Santa Ana River-Land and Water Conservation Fund Sites • Private property (commercial) • National Park Service • Riverside County Regional Park and Open Space District • County/City wastewater treatment facility • Other County owned • Union Pacific ROW • Potential Army Corp of Engineers jurisdiction
Existing Residential/ Private Structures	0	6	0	2	0
Existing Residential/ Private Property	0	6	0	8	0
Planned Residential Developments	0	2	8	1	0

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
CRE Rights (cont.)					
Existing Commercial/ Industrial Structures	6	16	3	10	3
Planned Commercial/ Industrial Developments	2	3	7	1	1
Community Feedback	• Past community opposition (local government and/or outside interest groups)	• No information	• No information	• County has expressed interest	• No information
Environmental					
Biological	• Potential impact to biological resources (Least Bell's Vireo, SW Willow Flycatcher, Burrowing Owl) • Land disturbance for access roads • Potential impact to Riparian Zones (mainly *indirect impacts* due to spanning the river and being adjacent to the Riparian Zones)	• Potential impact to biological resources (Least Bell's Vireo, SW Willow Flycatcher, Burrowing Owl) • Land disturbance for access roads • Potential impacts to Riparian Zones - removal of Riparian vegetation	• Potential impact to biological resources (Least Bell's Vireo, SW Willow Flycatcher, Burrowing Owl) • Land disturbance for access roads • Longest crossing of the Santa Ana River and Riparian Areas - removal of Riparian vegetation • Jurisdictional Wetlands (Army Corp of Eng) permitting issues	• Potential impact to bio resources (Least Bell's Vireo, SW Willow Fly., Burr. Owl, Los Angeles Angeles Pocket Mouse) • Significant land disturb. at access roads • Significant streambed alteration and impact to Riparian Zones – removal of Riparian vegetation • Extensive areas of Jurisdictional Wetlands (Army Corp of Eng) permitting issues (dredging and filling activities, sedimentation affecting aquatic life)	• Potential impact to biological resources (Least Bell's Vireo, SW Willow Flycatcher, Burrowing Owl) • Land disturbance for access roads • Potential impacts to Riparian Zones - removal of Riparian vegetation

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
Environmental (cont.)					
Recreational Use	• Equestrian/regional trail		• Recreational use impacts (T/L parallels hiking trail for 3 miles along the open areas of Hidden Valley Wildlife area)	• Recreational use impact at Riverside Regional Park (elevated access roads and pads 8-10 ft high and 56 ft wide through the park)	
Aesthetics	• View of private residences	• View of private residences	• Public views along Santa Ana River and Hidden Valley Wildlife Area • Largest crossing of the Santa Ana River	• Public views along Santa Ana River • Public views (berms/ levees) at County Park	
Hazards and Hazardous Waste	• Undetermined	• Undetermined	• Undetermined	• Potential impact to wastewater treatment facility (south of W. Agua Mansa Rd & E. Riverside Ave.)	• Undetermined
Air Quality	• Potentially less than significant	• Potentially less than significant	• Potentially significant (fugitive dust and exhaust emissions - civil work and truckloads of soil/concrete delivery)	• Significant impact (fugitive dust and exhaust emissions - civil work and truckloads of soil/concrete delivery)	• Potentially significant (fugitive dust and exhaust emissions - civil work and truckloads of soil/concrete delivery)
Transportation/Traffic Number of truckloads/ trips required for transport of earth materials (see p. 3- civil work). Calculations are based on the following: 15 CY soil per truck/trip 10 CY concrete per trip	3,400	4,400	12,000	22,000	8,300
Time and Cost	• Least costly (in terms of property acquisition & construction); shortest construction time	• Costly/long construction time (direct impact to residential/business structures, many turns in T/L that require custom engineering)	• Costly/long construction time (longest route; undergrounding for telecom; rework of existing structures at Pedley Substation)	• Most costly/longest construction time due to extensive civil work (flood water protection structures) and potential permitting requirements	• Unknown cost/time for land acquisition and securing permanent rights

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

	Bain Street	Van Buren Offset	Western (I-15)	Eastern	Original Van Buren
Overall Advantages (for details, please refer to pages 3-6)	• Existing multi-use utility corridor (flood control, gas, electric) • No structures on residential property • Least # of commercial properties impacted	• Least potential impact to Biological Resources • Smallest area subject to Land and Water Conservation Fund Sites	• No freeway crossings • Limited major street crossings		• Least potential impact to Biological Resources
Overall Disadvantages (for details, please refer to pages 3-6)	• Least cost/const. time • Greatest area subject to Land & Water Conservation Fund Site	• Greatest number of residential properties impacted • Greatest number of commercial properties impacted • Interference with planned growth and various County projects • Most crossings of Union Pacific ROW and major streets	• Extensive flood protection/civil work • Greatest potential aesthetics impact to public views • Greatest potential recreational use impacts • Longest span and crossing of the Santa Ana River • Longest route • Greatest # of T/L structures • Greatest potential impact to existing utility structures	• Most extensive flood protection/civil work • Most significant biological impact • Most significant permitting challenges (biology, flood control ROW, Army Corp of Engineers) • Significant Air quality impact (ground disturb./ civil work & transport of soil/concrete) • Significant transport./ traffic impact (22,000 truckloads of soil/concrete) • Most costly and longest construction time (civil work) • Most visual and recreational use impact to Rancho Jurupa Park and Louis Robidoux Nature Center areas (civil work) • Greatest # of structures without permanent property rights (Army Corp of Eng)	• Placement of structures on Union Pacific ROW is incompatible land use for construction, operation, maintenance of SCE T/L

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

TABLE 2
PROJECT OBJECTIVES

	Bain Street Route	Van Buren Offset Route	Western Route (I-15)	Eastern Route	Original Van Buren Route
System Reliability	↑	↑	↑	↑	↓
Constructability	↑	↑	↑	↓	↓
Environmental Impacts	↑	↑	↓	↓	↑
Cost and Time	↑	↓	↓	↓	↓
Impact to Private and Public Property	↑	↓	↓	↓	↓

↑ **Objective Met**

↓ **Objective Not Met**

Meeting Project Objectives:

System Reliability: Maintenance of adequate voltage levels along the T/L; secondary source of connection to the grid, allowing transfer of load between lines and substations in response to demand and reducing potential interruptions in service to customers; accessibility of structures for emergency repair and maintenance

Constructability: Flooding issues and civil work, length of route, number and height of structures, utility and other structure crossings (flood control, freeways, Union Pacific ROW, pipelines), accessibility during construction, engineering design requirements

Environmental Impacts: Use of existing ROWs or shortest feasible route to minimize effects on previously undisturbed land and resources; overall impact to biological and cultural resources, aesthetics, air quality, recreational uses, population and housing, transportation and traffic, and issues related to hazardous materials

Cost and Time: Construction costs, land acquisition costs (ROW, residential and commercial property rights or easements, L&WCFS, Army Corp of Engineers); meeting project needs in a timely manner.

Impact to Private and Public Property: Placement of T/L structures on residential, commercial, or public land and/or impacting structures and buildings; Land Use challenges

NOTE: Data is based on preliminary engineering and field observation and is subject to change during final engineering.

Appendix 5

Transmission Environmental Guide, SCE

TRANSMISSION ENVIRONMENTAL GUIDE

This booklet provides excellent descriptions of tasks needed to build new T/Ls. While the organizations mentioned may no longer exist, the work does and somebody has to do it. FRK 2003

Southern California Edison Company

FOREWORD

This Transmission Environmental Guide for overhead lines 200 kV and above has been prepared pursuant to the California Public Utilities Commission Request No. 111 of June 20, 1973, for "comprehensive written standards or policies for the design, construction, maintenance and repair of access roads, transmission towers and lines and attendant facilities, which will give reasonable consideration to the aesthetic values and conservation of natural resources, the restoration of pre-existing ecological conditions and the environment of area involved." This Guide is consistent with Southern California Edison's policy of enhancing and maintaining a high quality environment while continuing to provide reliable electric service.

The Guide shall be consulted and adhered to by all SCE personnel involved in the process of route selection, acquisition, design, construction and maintenance of transmission lines.

Robert N. Coe

TABLE OF CONTENTS
TRANSMISSION ENVIRONMENTAL GUIDE
Overhead Lines, 200 kV and Above

1. INTRODUCTION

Scope

This document provides guidance in building transmission lines, but does not direct itself to the planning aspects of designing a transmission system. Therefore, this Guide is to be used after decisions have been made concerning system needs and operating dates, the system terminals, the system voltage and the line capacity.

The Guide covers construction of overhead transmission lines above 200 kV. This voltage coincides with the requirements for a Certificate of Public Convenience and Necessity as required by CPUC General Order 131.

The Guide reflects SCE's policies and practices concerning the environment, in all areas of acquiring new transmission lines, and in particular concerns itself with lines on new rights of way through natural environments.

Application

This document shall be used by all personnel involved with new overhead transmission lines on new rights of way, although certain portions will apply also to reconductoring projects or new lines on existing rights of way.

The Guide, therefore, will be distributed to and shall be an indispensable part of the required sources of information for: all Right of Way Managers, Chiefs, Supervisors and Agents; all Transmission Engineering and Construction Managers, Chiefs, Superintendents, Supervisors, Engineers, and Foremen; all Managers, Superintendents, Supervisors, Engineers, and Foremen in the Transmission Division; all Environmental Planners; and the Manager of Customer Services, Supervisor of Special Services, and Division Managers in the Customer Service Department.

2. GENERAL SCE TRANSMISSION LINE PRACTICES

220 kV Transmission Lines

The Edison standard for 220 kV transmission lines is double circuit structures. In remote or fire hazard areas, single circuit construction may be used to increase reliability and to reduce the possibilities of simultaneous line outages. In both cases, galvanized self-supporting lattice steel towers are the rule (see fig. 2.1 & 2.2). Aesthetically designed structures are considered for use primarily within metropolitan areas, with the choice to use either the single or double circuit

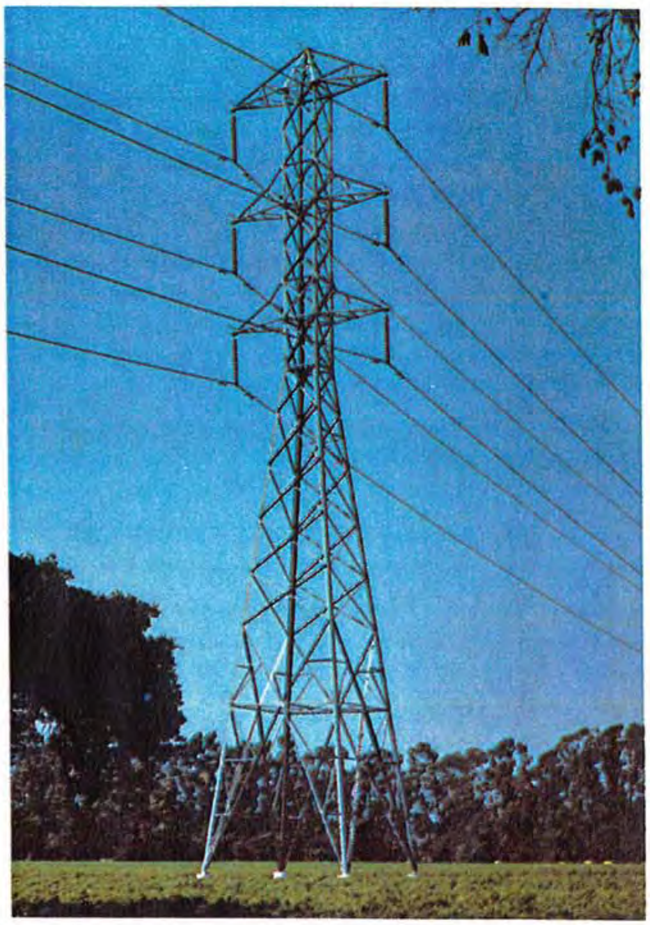


FIGURE 2.1
220 kV Double Circuit Lattice Steel Tower with Single Conductor Per Phase and Single Groundwire.

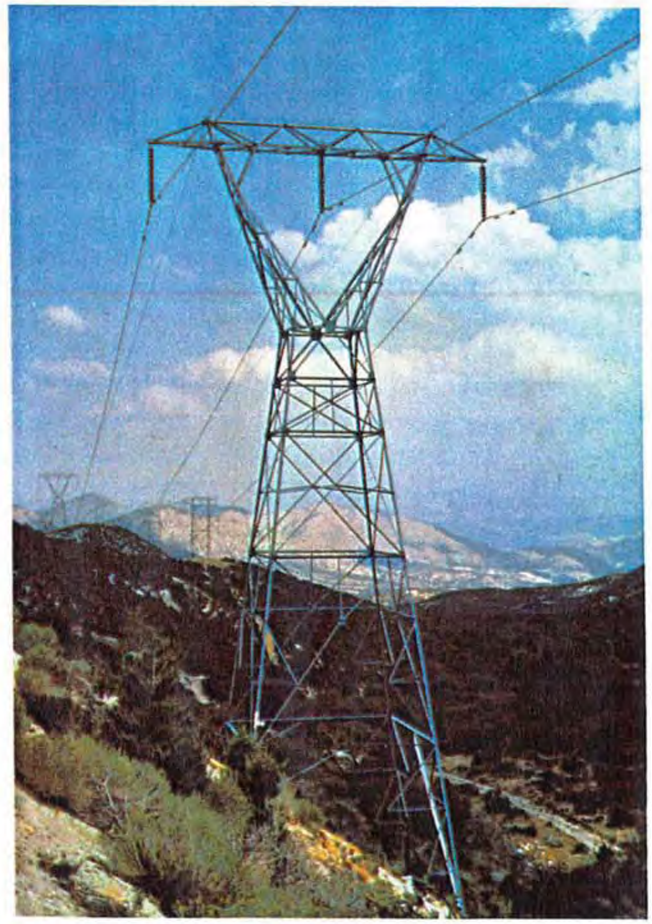


FIGURE 2.2
220 kV Single Circuit Lattice Steel Tower with Single Conductor Per Phase and Two Groundwires.

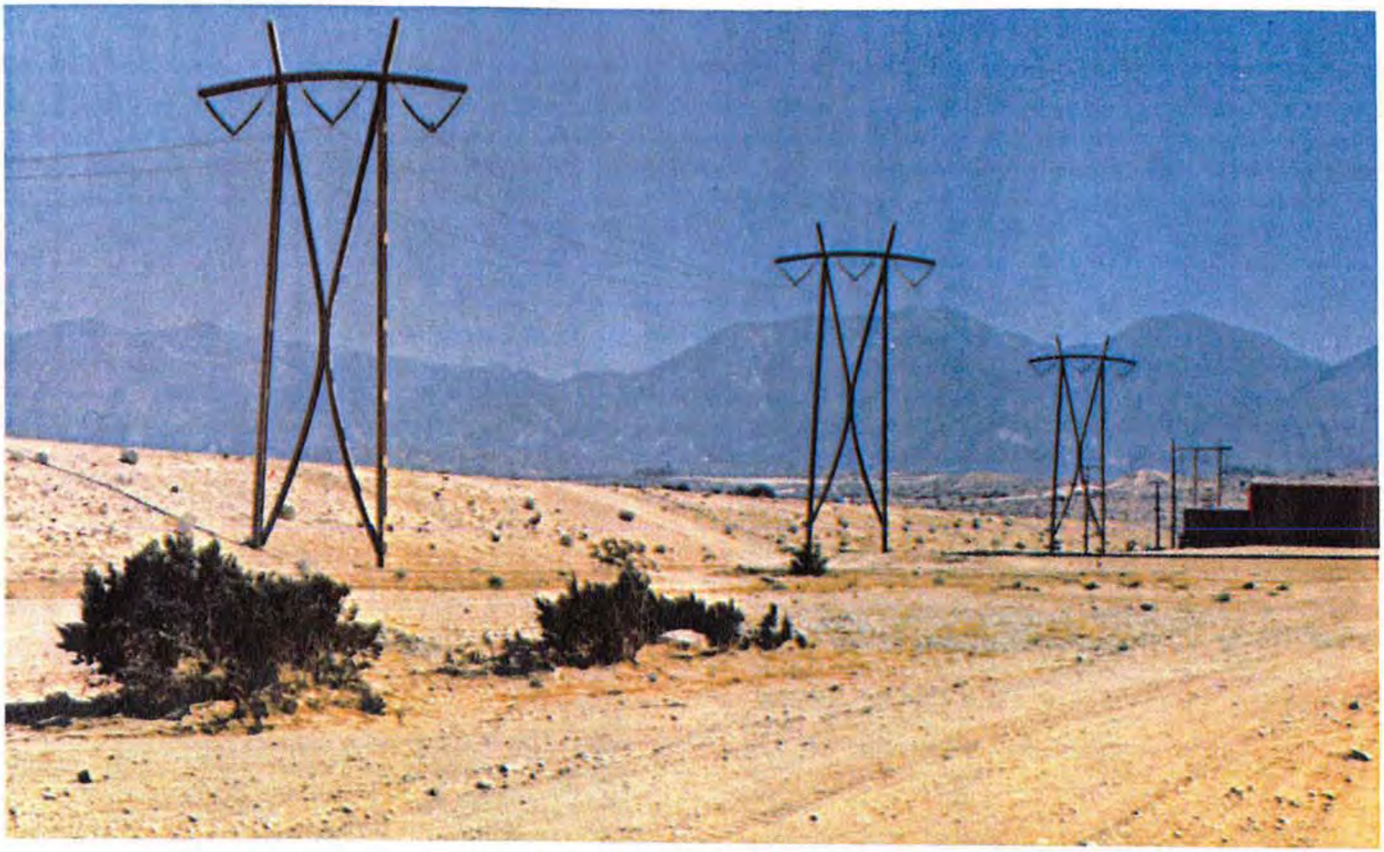


FIGURE 2.3 — 220 kV Aesthetic Single Circuit Structure.

FIGURE 2.4
220 kV Aesthetic Double Circuit Structure with Bundled Conductor.

variety determined after a review of the area through which the line will pass and the load requirements (see fig. 2.3, 2.4, & 2.5).

Along public streets or highways, self-supporting steel poles are used, with the conductors arranged to overhang the street or highway right of way (see fig. 2.6 & 2.7). Double circuit construction is utilized for median strip installations. Single circuit poles are used when sidewalk or streetside parkway locations are necessary.

Any transmission line may consist of several structure types, each tailored to the immediate location for visual appearance and structural loads.

At the present time, all 220 kV lines are built using aluminum cable steel reinforced (ACSR) conductors in single or bundled configurations depending upon electrical load requirements (see fig. 2.1 & 2.4).

In areas subject to corrosion, whether due to industrial contamination or humidity in the air, greased conductors are used. These conductors tend to blend in with their surroundings because of the characteristic dark appearance they quickly assume. In clean air and dry areas, such as forest or desert locations, non-specular (dulled) conductors are used.

All tower lines, regardless of type of construction or type of structures used, are protected by

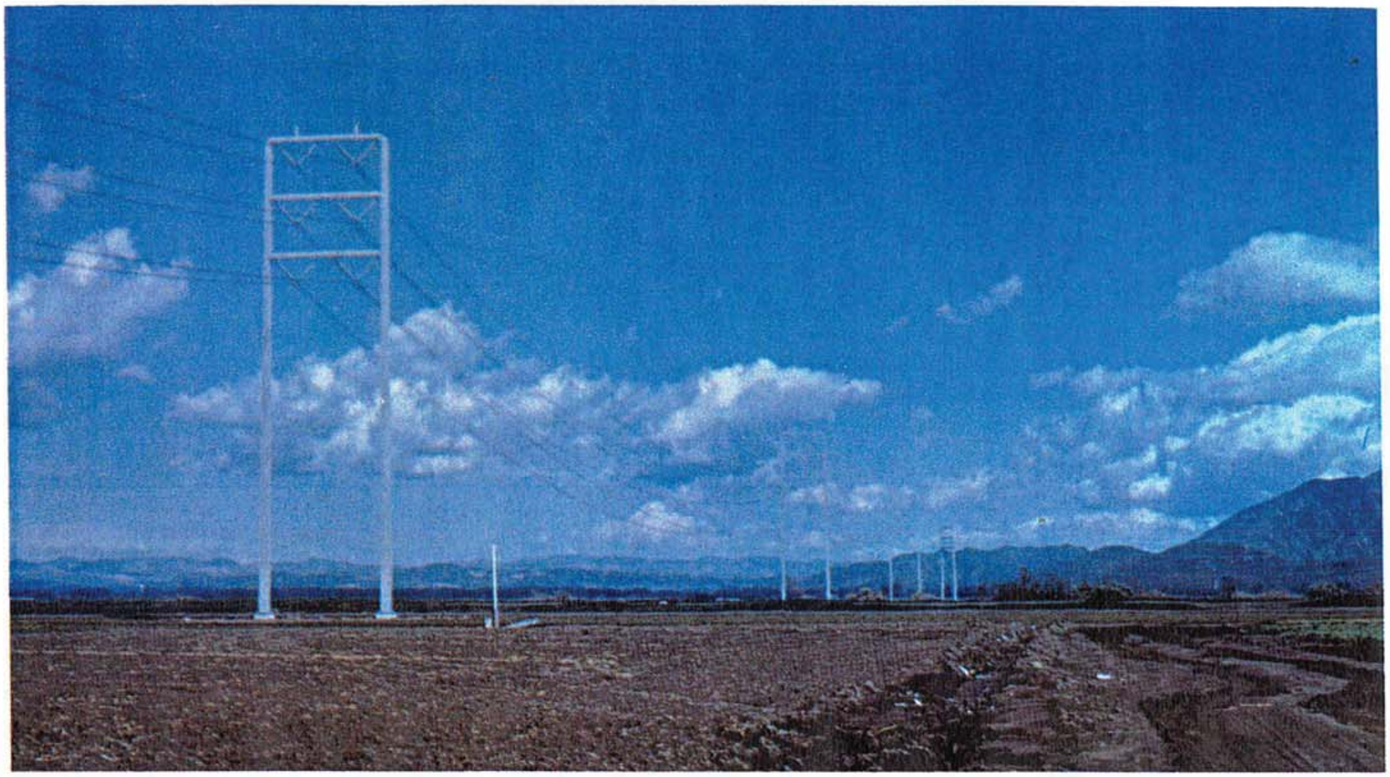


FIGURE 2.5 — 220 kV Aesthetic Double Circuit Structure.

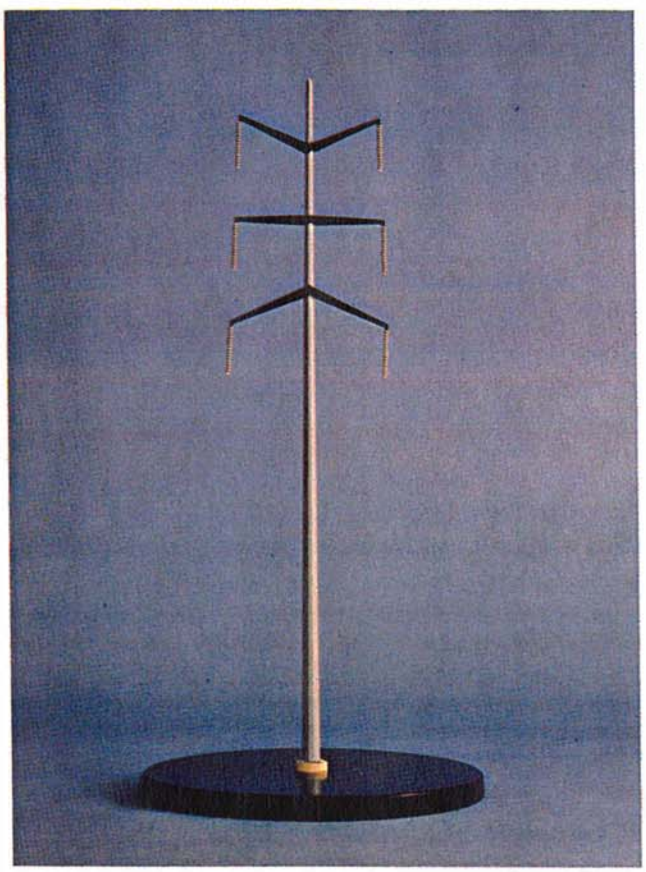


FIGURE 2.6
220 kV Double Circuit Steel Pole. [Model]

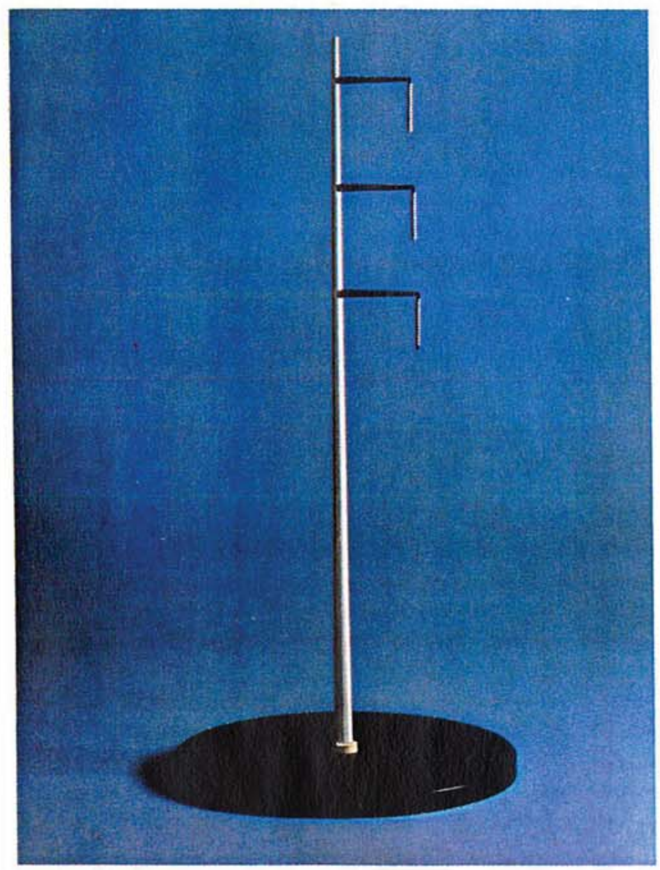


FIGURE 2.7
220 kV Single Circuit Steel Pole. [Model]

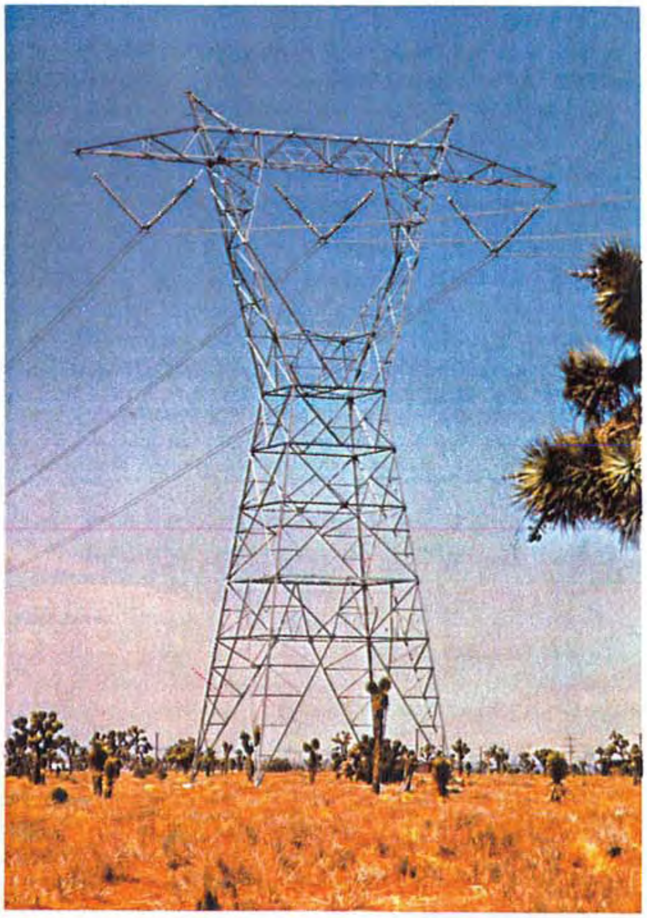


FIGURE 2.8
500 kV Single Circuit Lattice Steel Tower.

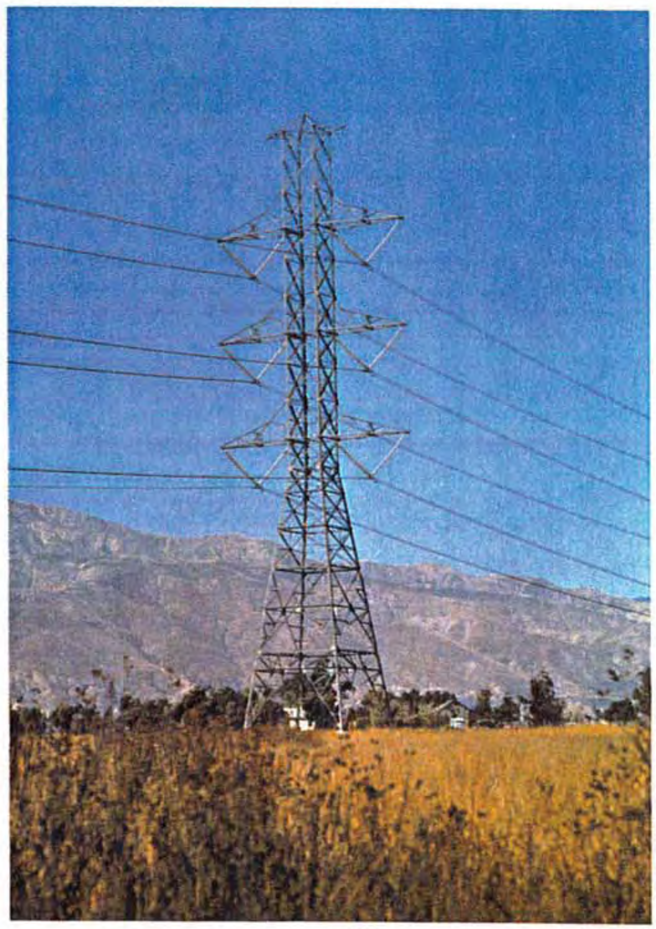


FIGURE 2.9
500 kV Double Circuit Lattice Steel Tower.

overhead groundwires to reduce the probabilities of flashovers during electrical storms. The choice of the type of groundwire and the number used are dependent on the type of construction considered. Single circuit lattice structures generally use two groundwires per tower line; double circuit lattice structures typically use one groundwire per tower line although two are used with some tower types where isokeraunic (lightning storm) levels are high (see fig. 2.2 & 2.1).

Because of conductor swing and electrical clearance requirements, normal right of way widths for double circuit 220 kV lines are 100 feet for one line and 50 feet of right of way for every additional tower line. For single circuit tower lines, one line requires a 150 foot right of way and each additional line 100 feet.

500 kV Transmission Lines

The standard for 500 kV lines is single circuit structures. Double circuit structures are used where insufficient R/W is available or when land costs are so high that single circuit construction would be economically impractical. In both cases, galvanized, self-supporting lattice steel towers are the rule (see fig. 2.8 & 2.9).

At locations where high public exposure or visual sensitivity outweigh the increases in line costs, aesthetic structures will be used.

A two-bundle ACSR non-specular conductor is presently being used throughout the 500 kV transmission line system. All 500 kV transmission lines are protected by two overhead groundwires.

The right of way width required for 500 kV transmission lines is a function of tower line separation, distance from tower centerline to the edge of the right of way and the location of the transmission line. The following table lists the normal right of way requirements for single circuit 500 kV transmission lines. A double circuit 500 kV T/L normally requires a 200 foot R/W.

More than two parallel 500 kV lines should be on a new right of way, at a minimum distance of 2000 feet where practicable. The latter separation of lines is necessary to insure that jeopardy to the bulk power system by loss of all lines on one common right of way is minimized.

Location	Centerline Tower to Tower Separation [ft.]	Centerline of Tower to R/W Edge [ft.]	R/W Width [ft.] 1 Tower Line	R/W Width [ft.] 2 Tower Lines
Urban	130	100	200	330
Remote	130	80	160	290
Forests	200	80	160	360

Practices Common to Both 220 kV and 500 kV T/L's

G.O. 95 Requirements

As a minimum, all transmission lines constructed in California meet the requirements of the California PUC General Order No. 95 "Rules for Overhead Electric Line Construction."

Adherence to Governmental Agency Requirements

At appropriate locations, transmission lines are designed and built to include the specific considerations of the United States Forest Service, Bureau of Land Management and other applicable governmental agencies.

In the event of a conflict between the Company's specifications and the requirements and specifications of the affected agencies, those of the agencies take precedence.

Design Guide

Edison's "Aesthetic Guidelines for Electric Transmission - Design Guide," which was prepared by Henry Dreyfuss Associates for the development of aesthetic guidelines for transmission facilities, shall be utilized in applicable instances.

3. ORGANIZATION AND PROCEDURES

3.a. *Route Selection*

General Procedures

The Special Projects Section of the Right of Way and Land Department prepares transmission line route feasibility studies at the request of the Transmission/Substation Engineering Division.

This study evaluates, as a general rule, at least three potential transmission line routes; their impact on natural resources, community values, aesthetics of the area, public health and safety, parks, recreation areas, scenic areas, highways, historic buildings and archaeological sites; and includes cost benefit analyses.

During preparation of the route feasibility study, the Right of Way and Land Department confers with the Engineering and Construction, Power Supply, Customer Service, Law, Fuel Supply, and System Development Departments.

The transmission line route feasibility study is forwarded to T/S Engineering for the development and inclusion of additional inputs and the recommendation of a preferred route to the System Lines Committee.

The System Lines Committee is responsible for approving final route selection and is comprised of the following:

- Power Supply Department
  - General Superintendent
  - Manager of System Operation
  - Manager of Transmission
- Engineering & Construction Department
  - Manager of Transmission/Substation Engineering & Construction
  - Manager, Transmission/Substation Engineering
  - Manager, Transmission/Substation Construction
- Right of Way & Land Department
  - Manager, Land Acquisition
- System Development Department
  - Chief Planning Engineer
  - Manager of Environmental Planning
- Law Department
  - Senior Counsel
- Customer Service Department
  - Chief Engineer

Specific Procedures

During preparation of the route feasibility study, several organizations make determinations within their respective areas of expertise and forward their information to the R/W and Land Department for analysis and subsequent incorporation into the feasibility report.

Environmental Planning of the System Development Department, gives advice on which route will produce the least burden on natural resources, aesthetics of the area, public health or safety, parks, recreational or scenic areas, historic sites or buildings, archaeological sites, or proposed public projects. Environmental Planning also will give advice on the impact of each route on air, water, land and on other aesthetic, environmental and ecological requirements of the public.

Urban/Regional Planning, of the System Development Department, determines the impact of the alternate routes on population distribution or concentration.

The Engineering and Construction Department determines if any existing rights of way can be utilized, and with System Planning determines if it is desirable to separate proposed circuits from existing circuits.

Engineering and Construction further calculates comparative construction costs (order of magnitude) for the proposed and alternate routes, determines the exposure to such hazards as flooding, fires or icing, and estimates line costs for proposed and alternate routes.

The Right of Way and Land Department will determine if governmental permits or other approvals of any kind are required to construct the line. This Department also prepares comparative land acquisition cost estimates (order of magnitude) for the proposed and alternate routes, and determines if any undesirable land use patterns will be created. Right of Way and Land makes a preliminary investigation to determine if there are any unusual access problems from the standpoint of both construction and maintenance and, if necessary, locates proposed and alternate routes in relation to highways, roads or other means of access. The likelihood of favorable acceptance from landowners along the alternate routes is also determined by Right of Way and Land.

Future plans for other public improvements, such as freeways, channels, pipelines or scenic highways, are investigated by the Right of Way and Land Department. If there are airports in the vicinity, Federal Aviation Administration flight pattern regulations are considered. In addition, this Department makes a cost benefit analysis, considering and balancing the environmental effects of the proposed facilities.

The Customer Service Department requests position statements on route selection from local governmental agencies and investigates all applicable ordinances.

3.b. *Structure Type Selection*

The selection of structure types begins when the transmission line route is being selected and sketches of the proposed structure are prepared. The Transmission/Substation Engineering and Construction Organization will request recommendations from organizations within and outside the Company.

Within the Company, recommendations will be obtained from Customer Service, Power Supply and System Development.

Customer Service shall coordinate the structure type with land use planning and with other existing or proposed right of way.

Outside consultants may be contacted for the selection of the structure type at locations with high visibility. Henry Dreyfuss Associates were consulted on many of Edison's aesthetic tower projects over the past years. Edison has installed several hundred aesthetic structures of varying Dreyfuss designs that have proven to be acceptable to the industry and the public.

After all the recommendations are received and analyzed in accordance with SCE's "Aesthetic Procedures and Guidelines"[1] as approved in October 1971, the T/S Engineering Division will recommend the structure type. The recommendation, including structure evaluation and the economic comparisons of different structure configurations (with in-place and operating costs), will be submitted to the Transmission Planning Committee for recommendation to PERC[2] for approval.

A summary of the responsibility of each organization involved in the structure type selection is shown in Table 3.1. All the participating organizations shall be aware of their areas of responsibility and provide the necessary information as assigned.

3.c. *Structure Location*

Structure location selection is a major portion of final transmission line design. It begins after preliminary line design is complete, when conductor, structure types, and routes have been selected.

By following the selected route, the survey crew will establish all P.I.'s (points of intersection) where the transmission line changes direction. This information, with aerial photographs, will be used for preparing profiles.

Profiles are prepared by the Right of Way and Land Department and transmitted to Transmission Engineering for tower spotting. After the tower locations are determined and plotted on the profiles, the survey crew will stake the towers to locate the center positions and the elevation data for line design.

After reviewing the staking notes, the Transmission Project Engineer will arrange a field meeting and invite the following organizations to inspect each site:

1. Transmission Division and Transmission Field Division, Power Supply Department, for operation and maintenance.
2. T/S Construction, E & C Department, for road and footing construction and tower installation.
3. Grading, Foundations & Structures, E & C Department, for footing design and road location.
4. Environmental Planning, System Development Department, for environmental impact.
5. Survey Section, R/W and Land Department, for locating tower sites in the field and restaking.

If a tower location is found unsuitable, one or more approximate alternate locations will be specified by the Transmission Project Engineer at the field meeting with concurrence by the other organizational representatives. The final location will be selected after staking of the alternates and meeting all line design criteria.

3.d. *Road Location*

Roads for access to transmission structures are located by the Right of Way Survey Section interfacing with a qualified Civil Engineer from the Grading, Foundations and Structures Section of Transmission/Substation Engineering and Environmental Planning if appropriate. All final road locations shall be approved by Transmission Engineering.

The Right of Way and Land Department is responsible for the layout and acquisition of required rights.

Transmission line access roads are laid out and constructed in accordance with the Company's standard specification for roads. This specification includes grade, alignment, and other access road design criteria.

Roads on Private Property

In order to expedite the appraisal of property for purposes of acquisition, the Survey Section shall furnish the Drafting Section a preliminary access

1. A study made by Edison's Ad Hoc Working Group to (1) define aesthetics and related expenditures and (2) prepare procedures for making aesthetic decisions and developing guidelines to administer such procedures.

2. Plant Expenditure Review Committee, originated by William R. Gould, Senior Vice President, in November 1969. The purpose of the committee is to advise the chairman on matters concerning the planning, budgeting and construction of electric plant facilities.

TABLE 3.1
CHECKLIST OF REQUIRED INPUTS TO RESPONSIBLE ORGANIZATIONS

	POLITICAL CLIMATE	COMMUNITY SENSITIVITY	EXISTING LAND USE	ZONING	PLANNED LAND USE	ENVIRONMENTAL IMPACT	COMMUNITY IMPACT	LINE ROUTES	ALTERNATE PLANS	SENSITIVITY VALUES OF VARIOUS AESTHETIC COMPONENTS	COST OF VARIOUS AESTHETIC COMPONENTS	OPERATION & MAINTENANCE ASPECTS OF AESTHETIC COMPONENTS	AESTHETIC DECISIONS	AESTHETIC DECISIONS REVIEW	AESTHETIC DECISIONS APPROVAL
CONSULTANTS										X					
CUSTOMER SERVICE															
STAFF	X	X	X	X	X		X								
DISTRICT	X	X					X								
DIVISION	X	X					X								
ENGINEERING & CONSTRUCTION								X	X		X		X		
PERC														X	X
PLANNING COMMITTEE														X	
POWER SUPPLY												X			
SYSTEM DEVELOPMENT															
ENVIRONMENTAL PLANNING						X		X		X					
SYSTEM PLANNING					X										
URBAN PLANNING							X			X					
RIGHT OF WAY AND LAND			X		X	X	X	X							
SYSTEM LINES COMMITTEE (APPROVAL ONLY)								X							

road story, immediately following approval of the line as established on the ground. This activity normally requires field inspection of terrain problems, plotting the approximate location of the proposed through access road layout on existing photo or topographic maps, and an intelligent selection of the probable stub access roads. The Survey Section will coordinate information on revisions of the access road layout, access road flagging and access road surveys, until such a time as the access road layout is approved by Transmission Engineering.

Roads on Government Lands

In addition to the procedures outlined above for roads located on private property, road layout and design shall be coordinated with the R/W Federal Permits Section for roads on government lands. The Federal Permits Section shall secure any rights or permits needed to locate these roads.

3.e. *Certificates and Environmental Studies*

Certificates

The California Public Utilities Commission, by General Order Number 131, requires that a Certificate of Public Convenience and Necessity be issued for all overhead transmission lines in excess of 200 kV. This Certificate must be granted by the CPUC prior to construction of any new and some modified transmission facilities. In general, the Company attempts to obtain this Certificate prior to any commitment of large funds for material or construction. Since lead time for the CPUC to issue this Certificate is approximately one year from submittal of the application, expenditures are authorized for specific projects with critical operating dates prior to receipt of the Certificate.

Transmission/Substation Engineering shall request Power Contracts to coordinate preparation of the CPUC General Order No. 131 application. T/S Engineering shall further supply Power Contracts with all preliminary location, design and economic information required for the application. Transmission Engineering shall initiate the preparation of an environmental report and request Environmental Planning to coordinate the preparation.

Customer Service shall request position statements from all local governmental agencies; except the County of Los Angeles, which shall be requested by Public Affairs.

System Planning shall supply data to substantiate the need for the new or rebuilt transmission lines.

The Law Department shall provide necessary legal support to Power Contracts for preparation of the application and file the completed application, including the environmental report, with the California Public Utilities Commission.

Environmental Studies

The R/W Department will request an Environmental Inventory or Assessment to be prepared by Environmental Planning for use in the Route Feasibility Report. The Inventory is a general area survey and report of natural and man-made resources.

Transmission Engineering will request an Environmental Analysis to be prepared by Environmental Planning for final route selection. This Analysis shall be a detailed environmental analysis and report covering the preferred and alternate routes.

After the final route for a transmission line has been approved within the Company, Transmission Engineering will request Environmental Planning to prepare the Environmental Impact Report.

The scope of an environmental impact report is determined by the Environmental Planning Organization and usually depends on the criteria established by the lead regulatory agency. If the major portion of a line route crosses lands of the Bureau of Land Management, for example, BLM probably would be the lead agency, even though several other federal agencies might also be impacted. Transmission lines associated with a nuclear generating station probably would have the Atomic Energy Commission as lead agency. In other cases, the California Public Utilities Commission probably would be the lead agency. Very early in the report preparation process, the Environmental Planning Organization shall determine which of the governmental entities is to be the lead agency and whether a Negative Declaration can be filed in lieu of the Environmental Impact Report.

Rules and Guidelines established by the California Environmental Quality Act (CEQA) or the National Environmental Protection Agency (NEPA) are used, depending on whether a state or federal agency is involved.

The Environmental Impact Report is prepared by the Environmental Planning Organization from information established in the Environmental Inventory and the Environmental Analysis. Transmission Engineering shall supply any necessary line design information, and review and approve the Environmental Impact Report.

4. GOVERNMENTAL AGENCY CRITERIA

Several governmental agencies have established criteria to be used during various phases of transmission line work. Most of these criteria are published in the form of suggestions designed to minimize the impact of transmission lines on the environment; however, some of the criteria may become definitive requirements under specific circumstances. The Company adheres to the requirements, where appropriate.

Several governmental publications deal with transmission lines on a much broader base (i.e., regional or federal) than the areas encompassed by the Company's service territory and contain several criteria not suited to our locale. Most of the current governmental publications dealing with transmission lines and the environment are published by federal agencies and are intended for use primarily on federal lands.

This chapter gives an overview of some of the transmission environmental criteria established at various levels of government, but does not necessarily suggest utilization in all cases.

4.a. *Route Selection*

Approximately one-half of the lands within the Company's operating and service areas are owned by the United States. For the most part, these lands are under the jurisdiction of the Department of Agriculture and the Department of the Interior. Various bureaus within these departments administer the lands.

The Bureau of Land Management and U.S. Forest Service are the bureaus most often dealt with in the route selection process. The Federal Permits Section of the Right of Way and Land Department contacts the appropriate agency or agencies in the route selection process to present proposed transmission line rights of way together with alternate routes. The corridor concept is one of the guiding criteria in the selection of proposed transmission line rights of way through federal lands. The appropriate federal agencies normally furnish advice to the Right of Way and Land Department on the potential feasibility of the proposed and alternate routes, and then a final selection of the route is made.

Various local, state and federal agencies must be contacted as appropriate during the route selection process. The contact can be either in the form of discussion and/or agreement as to the degree of feasibility of the proposed routes. Table 4.1 lists these agencies and whether approval or discussion is required.

TABLE 4.1

	APPROVAL REQUIRED	DISCUSSION REQUIRED
LOCAL AGENCIES		
City Council		X
Planning Commission		X
Board of Supervisors		X
Flood Control Districts	X	
STATE AGENCIES		
Public Utilities Commission	X	X
State Resources Agency	X	X
State Department of Forestry	X	X
State Highway Commission	X	X
State Lands Commission	X	X
Coastal Conservation Commission	X	X
FEDERAL AGENCIES		
Federal Aviation Administration	X	X
U.S. Army Corps of Engineers	X	X
Department of the Interior-Bureau of Land Management	X	X
Department of Agriculture-U.S. Forest Service	X	X
National Park Service	X	X
Bureau of Indian Affairs	X	X

4.b. *Structure Type Selection*

New and more aesthetic concepts in the design of towers should be considered. Coloring of towers to blend with the landscape may be desirable where they are located in or near areas of high scenic value.

The materials used to construct towers should harmonize with the natural surroundings. Self-protecting bare steel is appropriate in many areas. Towers constructed of materials other than steel, such as concrete, aluminum, or wood, should be considered.

The use of weathered or galvanized steel structures should be considered when transmission towers are to be silhouetted against the sky.

Simple, but functional designs of towers as illustrated in the book "Electric Transmission Structures," sponsored by the Electric Research Council, should be used.

4.c. *Structure Location*

Transmission facilities should be located with a background of topography and natural cover where possible. Vegetation and terrain should be used to screen these facilities from highways and other areas of public view.

When crossing canyons in a forest, high, long span towers should be used to keep the conductors above the trees and to minimize the need to clear all vegetation from below the lines. Clearing in the canyon should be limited to that which is necessary to string conductors.

In forest or timber areas, long spans should be used at highway crossings in order to retain much of the natural growth or provide a planted screen along the highways.

Where rights of way cross major highways and rivers, the transmission line structures should be strategically located for minimum visibility.

Where transmission facilities must be placed on slopes which parallel highways or other areas of public view, they should be located approximately two-thirds the distance up the slopes where feasible. With the slopes as background, the presence of the facilities will be less noticeable.

Avoid placing a transmission structure at the crest of a ridge or hill. Structures should be placed below the crest to carry the line over the ridge or hill, and the profile of the facilities should present a minimum silhouette against the sky.

4.d. *Road Location*

Use existing roads to the maximum extent possible.

Roads should follow natural contours to minimize cuts and fills.

Provide suitable cut and fill ratios and road grades to prevent soil erosion.

Road widths and curve radii should be reduced to the smallest dimensions commensurate with safety requirements.

Install adequate drainage facilities to insure the free flow of storm water.

Access and construction roads may be limited due to certain fragile or conservation aspects of the lands and natural resources.

The U.S. Forest Service specifies the majority of unique road location requirements in special use permits. These requirements vary from project to project and are not necessarily standard within the different forests. The special use permits for roads should be consulted for each transmission line project.

4.e. *Construction*

Land clearing restrictions, burning permits, dust control, noise abatement, road location and construction methods, erosion control, sanitary facilities and temporary land use are all regulated to varying degrees by governmental agencies.

The U.S. Forest Service specifically requires controls for fire prevention, access road construction requiring specific width, erosion control, dust control, vegetation clearing and disposal, borrow pits, side casting, cuts and fills and restorations upon completion of construction.

4.f. *Operation and Maintenance*

Transmission lines and properties shall be operated and maintained in a manner so as not to menace life and property.

Improvements to premises shall be maintained to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the representative of applicable regulatory agencies.

The scenic and aesthetic values of the transmission right of way and the adjacent land shall be protected as far as reasonably possible, consistent with safe and reliable operation and maintenance of lines.

Reasonable precautions shall be taken to protect, in place, all public land survey monuments, private property corners and forest boundary markers.

Soil erosion shall be prevented and controlled within the right of way and adjacent lands that might be affected by the operation and maintenance of the transmission lines.

The U.S. Forest Service specifies the majority of unique operation and maintenance requirements. The particular transmission line easement and applicable special use permits should be consulted for each transmission line.

5. METHODS AND TECHNIQUES USED

5.a. *Route Selection*

Concealment of transmission towers and lines is virtually impossible, but much can be done to make them less obtrusive and more attractive.

Heavily timbered areas, steep slopes, proximity to main highways, and scenic areas should not be utilized for rights of way if it is reasonably possible to avoid these areas.

Where possible, transmission line crossings of major roads or highways in the vicinity of intersections or interchanges should be avoided.

Locating transmission lines closely parallel to existing or proposed highways for significant lengths should generally be avoided. Alternative routes away from highways should be considered. Where ridges or timber areas are adjacent to highways or other areas of public view, overhead lines should be placed beyond the ridges or timber areas unless encroachment into these locations would create a greater environmental impact.

Avoid crossing at high points in the road so that the towers cannot be seen from a great distance. Instead, where possible, cross the highway between two high points, at a dip, or on a curve in the road.

Avoid open expanses of water and marshland and particularly those utilized as flight lines by migratory waterfowl and as heavily used corridors by other birds. Avoid areas of wildlife concentrations such as nesting and rearing areas.

Long views of transmission lines perpendicular to highways, down canyons and valleys or ridges and hills should be avoided. The lines should approach these areas diagonally.

Rights of way should not cross hills and other high points at the crests.

Aerial and ground reconnaissance of potential transmission line rights of way is made by various company personnel, including representatives of the Engineering and Construction, System Development (Environmental Planning), and Right of Way and Land Departments.

As the route selection process becomes more definitive, additional data is accumulated by the Right of Way and Land Department including order of magnitude cost estimates for surveying and mapping, acquisition of private rights of way and acquisition of rights across federal lands; lead time necessary for acquiring rights across private lands; and lead time and constraints involved in acquiring rights across lands in the public domain.

5.b. *Structure Type Selection*

A study of the environmental setting for the areas which the transmission line route traverses must be prepared before the structure type may be selected. Land use, biology, physical land features, existing and future transmission facilities and public and private organizations involved, usually are the most important factors studied.

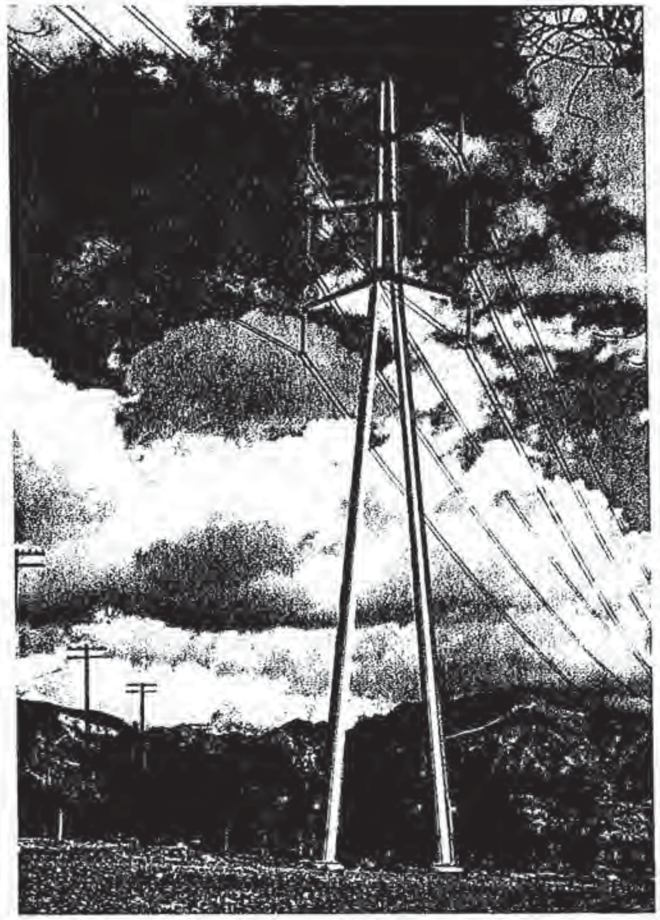


FIGURE 5.1
220 kV Contemporary Structure.

Structure scale models have proven to be the best way to provide a visual aid in structure design. Photographing the models using the actual landscape as background generally gives a true view showing the final effect of the design.

Since each individual structure has its own color characteristic, knowledge of color conditions will help in determining structure type. Structure paint samples are necessary to preview the actual structure color of the final installation.

The shape of the structure should relate to the environment by blending, harmonizing or in some cases contrasting. Where the towers are visible from close range, an aesthetic type structure should be considered. The design configuration should avoid irregularities. Simple lines, straight or curved, are preferred.

A list of the structures available in the Company is presented here along with the evaluations of their performances under general and special conditions.

Structure Types and Their General Applications

Lattice Towers

The self-supporting lattice steel tower is a commonly used type of construction for high voltage lines in the United States. The towers are fabricated from structural angle steel and galvanized to protect against corrosion. Dulled galvanized steel towers are used in natural environments such as deserts, mountains or forests. Because individual members are narrow, the towers are hardly visible from a distance of a few miles.

Contemporary Structures

The Contemporary family consists of mainly tubular and tapered, steel, multipurpose, aesthetic structures for general use, which are applicable to a wide range of situations and structural requirements. These are characterized by the distinctive arrangement and contrasting color of their crossarms. The Contemporary structures can be single, two or four legged and can be used to satisfy most 220 kV aesthetic installation needs (see fig. 5.1).

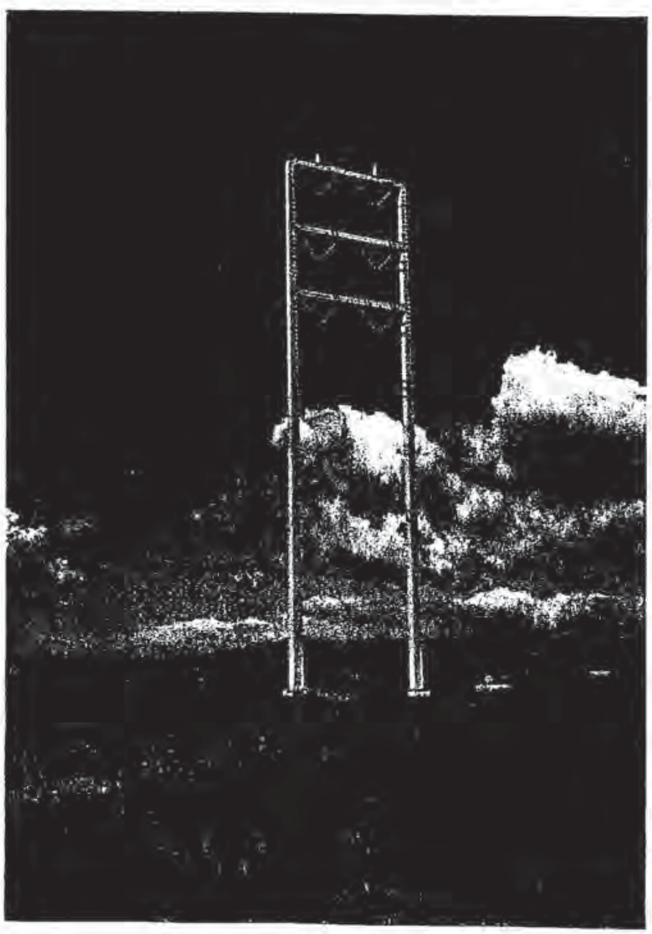


FIGURE 5.2
220 kV Portal Structure.

Portal Structures

The Portal is an alternate aesthetic structure of more limited use than the Contemporary. Portals are particularly applicable to long span, narrow right of way situations, where few changes in line angle or tower type are required (see fig. 5.2). The Vee-string insulator arrangements avoid the problem of off-set insulators which occurs in vertical suspension insulators. This design is most effective when used alone, without proximity to other style structures.

Tetra Towers

The Tetra family is composed of single circuit aesthetic structures for general use with 500 kV lines (see fig. 5.3). They are applicable to all situations in which conventional lattice towers are used and coordinate well with an existing lattice line. The family includes matching box section structures suitable for particularly high visual encounter or close viewing. All Tetras are four legged towers with a slender solid crossarm. The normal finish is weathering steel which blends well with earth tones usually found in the remote locations where they are generally used; but, for many instances, dull galvanized steel is more appropriate. Lattice and Tetra structures tend to disappear in distant viewing but the Tetra simplified form is also effective in close viewing conditions.

Arch Structures

Arch structures are intended for installations where close viewing is of prime importance as at the entry to a substation within residential locations. The arch shape relates well to structures within substations. Its triangular cross section is a reinforcement that adds considerably to its appearance (see fig. 5.4).

Structures Used Under Special Conditions

When a new line is to be installed parallel on the same right of way with an older lattice installation, its exposure to view will determine the best selection of structure design.

Duplication of lattice towers should be considered if viewpoints are predominantly distant and largely with natural backgrounds (such as hills).

Where the needs of the community or high visibility demand a simpler silhouette tower, or when the older tower line is to be removed at a later date, the Contemporary style is the best choice. In some situations, the contrast between the two types of towers can be detrimental by comparison.

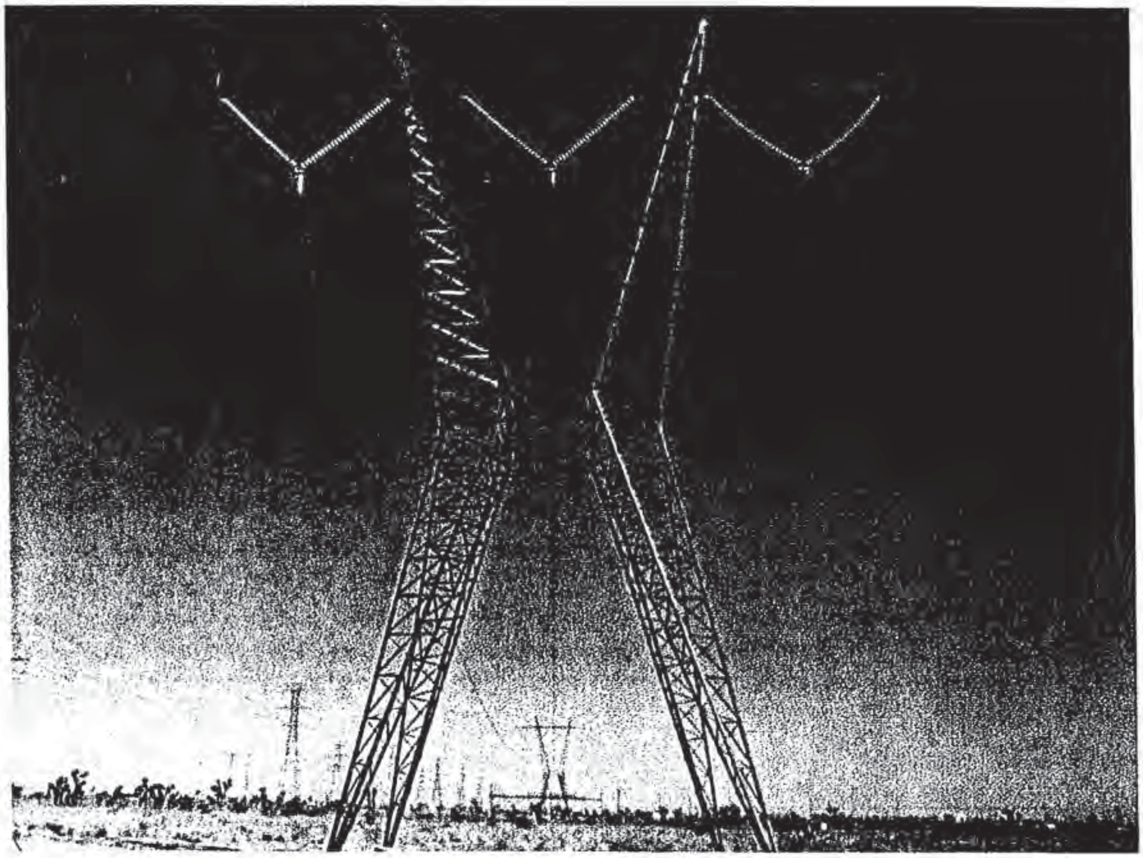


FIGURE 5.3 — 500 kV Tetra Structure.

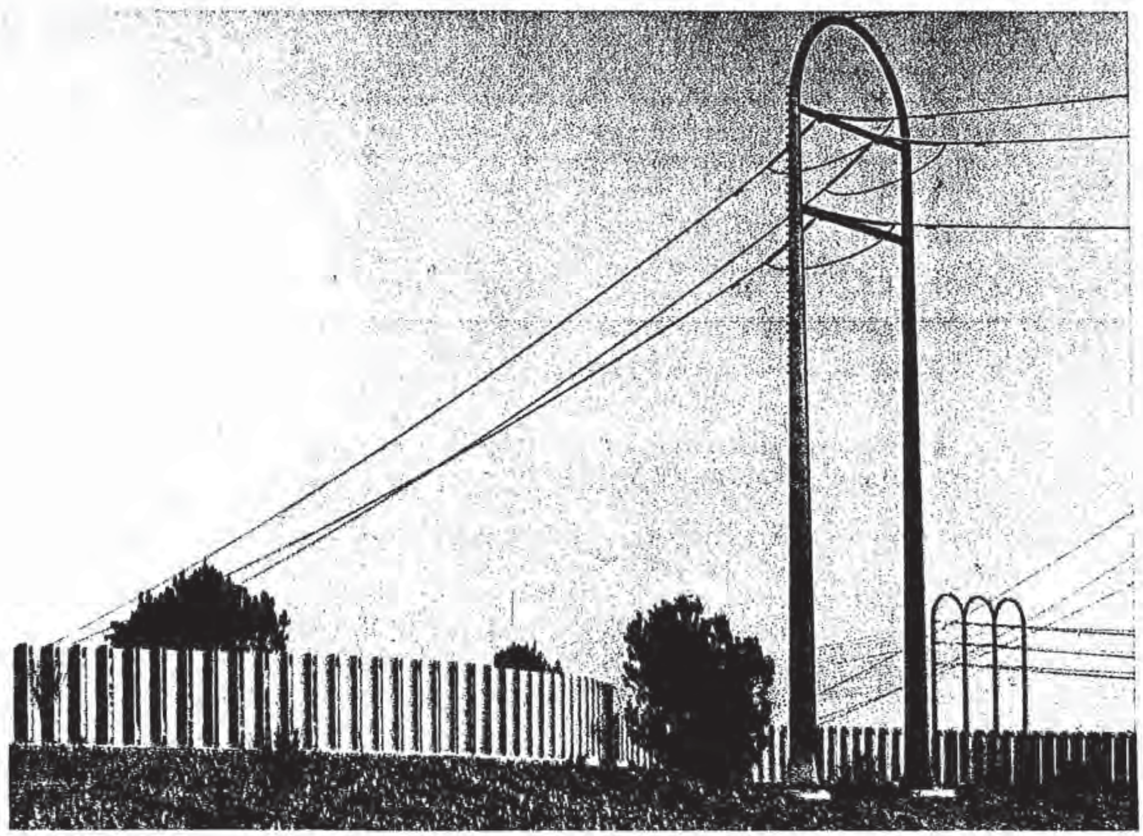


FIGURE 5.4 — 220 kV Arch Structure.

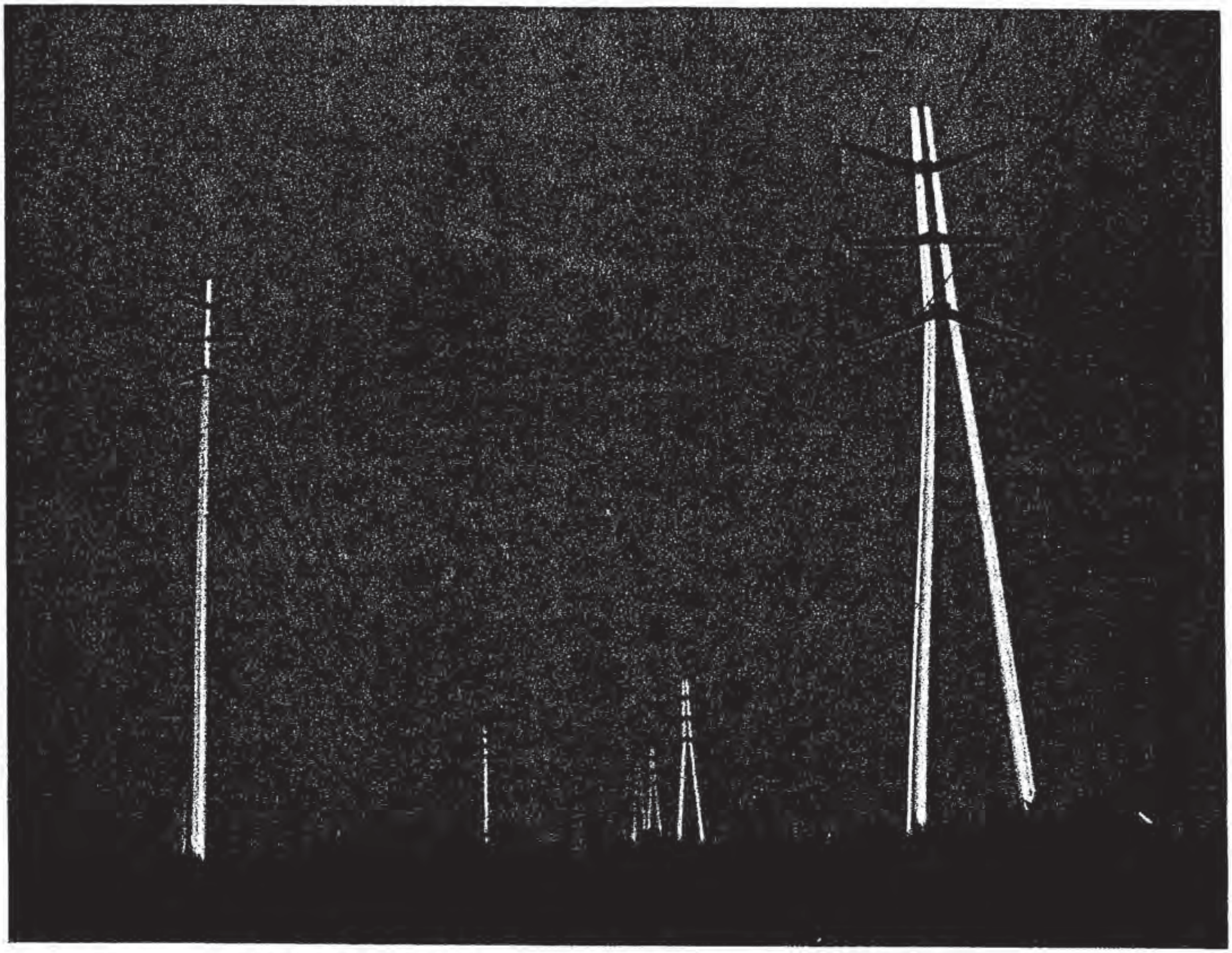


FIGURE 5.5 — 66 kV and 220 kV Contemporary Structures Together.

Portal towers normally should not be mixed with lattice towers; the contrast in both construction and style is too great.

For 500 kV transmission lines, in most instances, the same type lattice as the existing style should be installed in a new parallel line. In cases where demand forces the Tetra tower into combination, the similarities are adequate for use together.

When 66 kV and 220 kV are related, the Contemporary type should be used in combination with the Sunburst design. These two designs were purposely related (see fig. 5.5).

5.c. *Structure Location*

In order to select the structure locations which best suit the environment, it is necessary to preview the aesthetic effect of an installation before it is built. The following facilities and approaches should be used to determine the extent of the visual impact.

Aerial Photos and Topographic Maps

Aerial photos and topographic maps are common and proven tools for viewing terrain, vegetation, and land use relative to right of way corridors.

A small scale aerial photo should be used to provide an overall impression of the existing physical land features which the transmission right of way traverses (see fig. 5.6). A single line sketch of the same scale can be marked on the maps for a preliminary structure type and location study. The approximate number and location of angle structures may also be determined.

Larger scale aerial photos and topographic maps should be used for a more detailed study (see fig. 5.7). The size of the map should be sufficiently large to show detail such as existing trans-

FIGURE 5.6
Small Scale Aerial Photograph.

FIGURE 5.7
Larger Scale Aerial Photograph.

mission facilities, buildings, streets and vegetation, so that it can be determined whether or not the selected structures will fit into the surrounding environment. With the right of way width indicated on the map, tower location placement can be done with some assurance of success.

Large scale aerial photos and topographic maps should be used for those locations where transmission right of way is adjacent to areas of special interest. As the scale will be large enough to give all the detail information around the particular location, the final tower placement study can be achieved with sufficient accuracy. By using these maps as a reference, ground level photographs taken from different points of view can be obtained to examine the overall appearance of the structures in each particular location.

Ground Level Photographs

In reference to a topographic map or aerial photograph, full coverage ground level photos from predominant viewpoints can be used to exhibit existing conditions along a right of way, or by modifying the photographs, to provide a preview of the future installation.

Distant and close photos should be taken at all encounter junctions on the route. Viewing points shall be indicated on the aerial map or topographic map for reference.

Wide view photo montage should be obtained to provide a wider field of view and more interrelated information than the separate unrelated photos.

Retouched photographs may be used to aid in the selection of structures to provide a general comparison of the existing and proposed conditions.

Artist's Rendering

When a large number of new facilities are to be installed at a specific location, it becomes impractical to use the retouched photo. Therefore, an artist's rendering is used to illustrate the future installation. Care must be taken in preparing this type of drawing so as not to idealize the final condition. The artist's rendering is an excellent method to generate new ideas in structures for any particular location (see fig. 5.8). It can also serve the same purpose as the ground level photograph, but with more freedom to view the facilities from any selected point.

Tower Configuration Sketches

Sketches of the tower elevation provide a general outline of the structure to be installed. The

FIGURE 5.8
Artist's Rendering.

accurate scale of the sketch gives a more realistic sense of the tower proportion and insulator pattern. A list of various tower sketches with their structure characteristics can serve as a valuable reference when performing tower selection. In selecting tower locations, especially on mountainous terrain, tower sketches should be plotted on large scale profiles or cross line profiles to determine the best tower site to physically fit the actual terrain.

Structure Specifications

The structure specification not only provides requirements to the manufacturers for structure design, but also gives the line design engineer a reference for the structure strength capability. As part of the specification, a diagram with various loading conditions provides information on maximum tension, span, line angle and loadings for which the tower is designed. The tower then can be located in accordance with these engineering requirements.

Profiles

Schematic sectional elevations with scales 1" = 200' horizontally and 1" = 40' vertically are used to depict the interrelationship between towers, conductors and terrain features along the full length of the route. This standard profile is essential in selecting the tower locations and checking conductor clearances. A profile also contains a center line sketch of the transmission line with all points of intersection (P.I.), points of tangent (P.O.T.) and major crossings shown. If the line traverses mountainous areas, the line is drawn on a strip of plot map or topographic map with all the elevation information shown. This can be used for preparing a cross line profile to check the detail tower location and conductor swing.

Techniques for Locating Structures

Structures should be located at approximately equal distances from street crossings. If possible, crossings should be perpendicular to freeways and highways and accomplished with suspension towers. If adequate foliage for tower concealment is not present, towers should be located as far back from roads as feasible, while retaining normal tower proportions.

When planning alignments parallel to highways, consideration should be given to placing the structures away from the road right of way rather than adjacent. This will lessen the visual impact by avoiding exaggerated tower spacing and conductor sag. In farming areas, place structures near unimproved farm roads.

Alignments that result in corner towers in major visibility situations should be re-evaluated to shift the corner farther away.

The structures should be evenly spaced and excessive changes in height between adjacent structures avoided.

The structure locations should be such that the line follows the terrain, without serious difference in height. Whenever possible, locate the tower below hill crests to gain better proportions and as much concealment as possible.

At each location, take a 360° view to determine all critical points from which the structure may be seen.

Place the structure so that it has the ability to withstand anticipated structural loads, including factors of safety.

Where possible, avoid specific locations which would jeopardize the structure, such as stream beds, proximity to sheer cliffs, unstable side hills and high water table.

Consider accessibility for maintenance, especially during adverse weather conditions.

Locate structures with consideration for future paralleling transmission lines.

5.d. *Road Location*

After all transmission line structure locations have been established in the field and approved by the Transmission Project Engineer, the proposed access roads are flagged. These road locations are then mapped and presented to the property owners for their review, comment and approval.

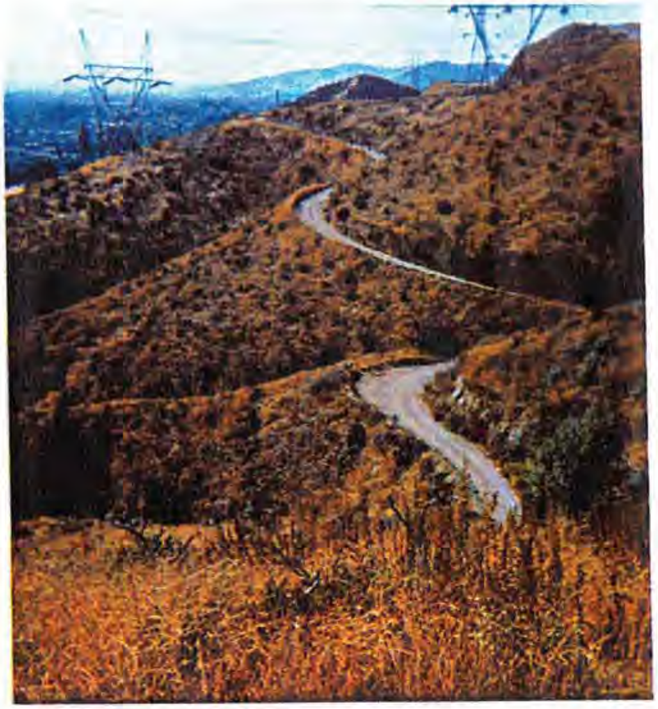


FIGURE 5.9
Access Road.

General Road Location Criteria

New access roads are located and constructed by the Company only when suitable existing roads are not available.

Roads shall follow natural contours where possible to minimize cuts and fills (see fig. 5.9). Where cuts and fills are necessary, suitable cut and fill ratios shall be used to minimize hauling and soil erosion.

The responsible Civil Engineer shall insure that adequate drainage facilities are provided. Hydrology and possible erosion studies shall be conducted in mountainous terrain to determine any additional need for drainage structures or special grading of the roads.

The Civil Engineer shall minimize road widths and curve radii while maintaining necessary road use safety requirements.

Areas of scenic or archaeological significance shall be avoided when locating roads.

Road Location Details

Transmission line access roads are generally laid out in accordance with the Company's standard road specification. This specification includes grade, alignment and other access road design criteria. All access roads on governmental lands shall be located and designed in accordance with the specific requirements of the agency involved.

Proposed roads are laid out by R/W Surveys prior to field inspection by the Civil Engineer.

The roads shall be physically identified using colored flagging to indicate the path of the proposed road. This flagging shall be tied to existing brush high on a stem directly above the grade line of the proposed road. When brush is not existing, suitable stakes marked "grade line" shall be used with the appropriate color flagging tied to the stake.

A marker shall be set at the junction of an existing or proposed through access road and a proposed stub road pointed in the direction of the tower site. A marker shall be set at the end of a proposed access stub road and marked "end of road."

The grade line of proposed access roads shall be flagged at a gradient corresponding approximately to the inside of the three foot berm.

The cross slopes of access roads are obtained in conjunction with the access road flagging. The cross slope, taken in percentage of gradient, shall be determined in the field and noted on suitable type maps in such a manner as to be easily interpreted in the office. The percentage of cross slope and its direction shall be taken at sufficient intervals to show significant changes in the steepness of the cross slopes.

Survey field Supervisors and Survey Engineering Analysts have the responsibility to coordinate the access road layout with other groups. The R/W Survey Section shall furnish the R/W Drafting Section one set of marked up photos or maps indicating the complete access road story. The Survey Section also shall advise the Drafting Section immediately of any subsequent revisions.

The R/W Drafting Section shall prepare drawings showing the location of existing and proposed access roads, and reproduce them for distribution to the Civil Engineer, Transmission Project Engineer and other interested parties within the Company. The maps that are reproduced from the drawings are color coded to delineate the different categories of roads and cross slopes.

After the roads have been laid out preliminarily by the R/W Survey Section, the Civil Engineer shall inspect the proposed road locations in the field to determine the road category. At this time, he shall ensure that the Company's road location criteria has been adhered to with the least possible impact on the environment, and note any locations where alternate roads should be investigated. The Survey Section shall lay out and stake these alternates in the same manner as the preliminary road locations.

When the Civil Engineer has determined the most appropriate routes for the roads, he shall obtain concurrence from the Transmission Project Engineer and proceed with final engineering and road design.

5.e. *EIR Preparation*

After Right of Way requests Environmental Planning to prepare an Environmental Inventory of the project prior to preparation of the route feasibility study, a preliminary field trip is conducted with the Right of Way Department and Transmission/Substation Construction. Coordinating their input with Transmission Engineering, Environmental Planning will then have an indication of the in-depth studies which will be necessary for the Environmental Impact Report. Subsequent field trips are conducted with archaeologists and biologists to determine in detail all archaeological and biological resources. These field trips often include the extensive use of Company helicopters and four-wheel drive vehicles.

The Environmental Planner shall also determine the possible adverse visual impact due to a transmission line through a complete analysis of all areas of probable visual contact. When an alternate route is located in a heavily populated urban area, the socio-economic impact of the location of the transmission line shall be discussed with Urban/Regional Planning.

It is often necessary to hire outside consultants to conduct archaeological, biological and geological surveys of the proposed transmission route.

As a means of coordinating the Environmental Impact Report, a preliminary outline is drafted (see example 5.1).

A copy of this outline is distributed to other organizations within the Company who will be reviewing the report. This outline will be followed as closely as possible.

Introduction

The introductory section of the EIR consists of a general description and statement of why the project is needed and also contains a statement of the Company's environmental policy. Transmission facility selection and route selection are discussed taking into account adjoining land use and considering aesthetic effects which will harmonize with the surroundings. The EIR also considers compatible secondary uses of Company owned transmission line rights of way.

Project Description

The project description specifies the type(s) of towers to be used, whether non-specular conductors will be used, the color of insulators and types of tower footings. Methods for controlling erosion, dust, water contamination and fire during construction and maintenance are discussed.

EXAMPLE 5.1

PRELIMINARY OUTLINE
ENVIRONMENTAL IMPACT REPORT

1. Introduction
   1.1 General Description
   1.2 Need for Transmission Line

2. Project Description
   2.1 Line Route
   2.2 Structures, Conductors, and Insulators
   2.3 Access Roads
   2.4 Construction Plans
   2.5 Maintenance Plans

3. Environmental Setting Before Proposed Project
   3.1 Land Use
   3.2 Biology
      3.2.1 Flora
      3.2.2 Fauna
   3.3 Physical Land Features
      3.3.1 Physiography
      3.3.2 Geology
      3.3.3 Faulting and Seismicity
   3.4 Archaeology and Historic Significance

4. Environmental Impact of the Proposed Project
   4.1 Land Use
   4.2 Archaeology and Historical Impacts
   4.3 Biological Impacts
      4.3.1 Flora
      4.3.2 Fauna
   4.4 Impacts on Land Uses
   4.5 Aesthetic Impacts
   4.6 Sociological & Growth Inducing Impacts

5. Environmental Impacts Which Cannot Be Avoided if the Proposed Project is Implemented and Mitigation Measures Proposed to Minimize the Impact
   5.1 Natural Resources
   5.2 Aesthetic Impacts

6. Alternatives
   6.1 Alternative Routes
   6.2 Alternative Structure Design
   6.3 Alternative of No Project

7. Short-Term Versus Long-Term Productivity

8. Irreversible and Irretrievable Commitments of Resources

9. Environmental Approvals and Consultations
   9.1 Status of Licenses, Permits and Approvals
   9.2 Consultations, Authors & Qualifications

10. Summary of Environmental Costs and Benefits
    10.1 Summary of Costs
    10.2 Favorable Effects of Construction

Environmental Setting Before the Proposed Project

Before a proposed transmission route is finally selected, a careful analysis of existing land uses in the area(s) of concern shall be made and discussed. Existing zoning ordinances and General Plans shall be carefully analyzed to ensure the project is compatible with existing and planned land uses.

The Company representative will determine through contact with the State Department of Transportation the locations of existing and planned scenic highways. The effect of potential visual impact of transmission facilities is considered and means to minimize the impact at highway crossings are discussed.

The total biological factors involved in a transmission project are determined through a complete listing of existing flora and fauna along the proposed routes by a qualified biologist. Since the presence and condition of flora and fauna are dynamic functions of the seasons, a monitoring program lasting for at least one year may be required. In the event that rare and endangered species of animals are encountered, all attempts to avoid their habitats must be made. Known nesting and breeding sites will be indicated in the EIR for subsequent notation on construction plans.

A complete listing of physiographic and geologic features of the project is made, including a careful listing of scenic areas. Wherever possible, these areas will be avoided. Qualified geologists shall review the presence of earthquake faults, if appropriate, for the EIR.

A detailed inventory will be made by a qualified archaeologist to locate and assess all sites of archaeological significance. In the event that a transmission structure has been located directly over an archaeological site, the structure will be relocated.

Environmental Impact of the Proposed Project

The Environmental Planner shall discuss thoroughly the impact of a project in the EIR and also discuss, with input from Engineering and Construction, methods to minimize this impact. Major areas of concern are the towers, conductors, roads required to construct and maintain transmission lines, and the clearing of rights of way necessary in some areas.

In addition, sociological and growth inducing impacts are important factors studied in the Environmental Impact Report. Primary impacts upon resources and economies in the proximity of the transmission line include construction activities which are of short-term influence. Demands will be placed on existing services, accommodations, material suppliers and local labor forces, but will

EXAMPLE 5.2 BASIC TABULATION TO BE USED IN COMPARING ALTERNATIVE TRANSMISSION ROUTES

	ALTERNATIVES	A		B		C		D	
INCREMENTAL GENERATING COST	Present Worth								
	Annualized								
CAPACITY FACTOR									
ENVIRONMENTAL COSTS	UNITS	Magnitude	Page	Magnitude	Page	Magnitude	Page	Magnitude	Page
1. Land use (Rank alternative routes in terms of amount of conflict with present and planned land use)									
2. Property values (Rank alternative routes in terms of total loss in property values)									
3. Multiple use (Rank alternative routes in terms of envisioned multiple use of land preempted by right of way)									
4. Length of new rights of way required									
5. Number and length of new access and service roads required									
6. Number of major road crossings in vicinity of intersections or interchanges									
7. Number of major waterway and railroad crossings									
8. Number of crest, ridge, or other high point crossings									
9. Number of "long views" or transmission lines perpendicular to highways and waterways									
10. Length of above transmission line in or through the following visually sensitive areas									
10.1 Natural water body shoreline									
10.2 Marshland									
10.3 Wildlife refuges									
10.4 Parks									
10.5 National and state monuments									
10.6 Scenic areas									
10.7 Recreation areas									
10.8 Historic areas									
10.9 Residential areas									
10.10 National forests and/or heavily timbered areas									
10.11 Shelter belts									
10.12 Steep slopes									
10.13 Wilderness areas									
10.14 to (Other sensitive or critical areas, 10.20 specify)									
10.21 Total length through sensitive areas (sum. 10.1-10.20)									
10.22 Total net length through sensitive areas (sum. 10.1-10.20 eliminate duplication)									

expand the local economy to some extent. Secondary growth inducing impacts are usually of long-term nature. They include increased local and regional tax bases and long-term jobs for locally based personnel involved with maintenance of the transmission facilities. A short-term impact, however, results from the relocation of construction forces when construction of a transmission line is completed.

Unavoidable Environmental Impact and Mitigating Measures

The Environmental Planner must be aware of the various techniques used to minimize or reduce the visual contact of a transmission line when preparing the EIR.

Alternatives

Under this section of the Environmental Impact Report, alternatives of routes, structure designs, and "no project" are discussed. One of the methods used by Environmental Planning to analyze and communicate the different route alternatives is to build a table or matrix of factors and alternates as shown in Example 5.2. This approach allows both a qualitative and quantitative analysis of the route selection process.

The alternative of "no project" is usually a function of electrical need and alternative system plans. Appropriate inputs are provided by System Planning.

Short-Term Versus Long-Term Productivity

Plant and animal communities usually recover from the impact due to construction. The long-term impact due to a transmission line project is dominantly visual. Transmission lines and towers and access roads will continue to be seen during the lifetime of a transmission project.

Irreversible and Irretrievable Commitments

Generally speaking, there are no major irreversible and irretrievable commitments associated with transmission lines. The land associated with rights of way will re-establish itself after a period of time.

Environmental Approvals and Consultants

This section of the Environmental Impact Report includes a listing of local regulatory agencies, local conservation and concerned advisory groups, state regulatory agencies, federal regulatory agencies, and all other groups that may be interested in the project. This section also includes a list of all permits, licenses and other approvals required. It is customary to include in the report all letters and consultations received during the various hearings.

Summary of Environmental Costs and Benefits

A summary of the costs of environmental benefits should be included in the EIR. The additional cost due to the use of non-reflective conductors and towers, aesthetic structures, landscaping and restoration of wildlife habitats, and the added length of transmission lines due to efforts to minimize visual exposure should be summarized in this part of the report.

To alert contractors and Edison construction crews to the existence of rare and endangered species, Environmental Planning will provide copies of the EIR, range maps, photographs or pictures, and a complete listing, including descriptions, of all animal and plant species to be expected in the proximity of the project.

6. ENGINEERING

6.a. *Transmission Lines*

Prior to starting line design, the Transmission Project Engineer shall become familiar with decisions made during the route selection and structure type selection processes. Any special conditions, agreements or compromises arrived at during the planning and preliminary engineering stages should be noted.

The design approach for a transmission line project on new rights of way is significantly different from that on an existing transmission line corridor; therefore, design approaches are discussed in two different subsections.

New Transmission Line Right of Way

Working Documents

The primary working tool is the profile drawing. This profile normally is prepared by a photogrammetric process from actual aerial photos of the selected line route and is used to locate the towers, to show the conductor sag curve between towers and the conductor size and tension information.It also indicates tower information, such as construction number, tower type, leg sizes, station (profile), centerline pipe elevation, foundation elevation, point of support elevation (bottom crossarm only), and line deflection angle. This document, along with the tower data sheets, serves as a permanent record of the line design.

Photogrammetric strip maps, consisting of multiple pages made from the aerial photographs for the entire line route, are also useful. Shown on the maps are the transmission right of way, transmission line centerline, tower locations, construction numbers, railroad rights of way, flood control rights of way, highway rights of way, roads, property lines, property owners, existing access roads to be used, and proposed access roads for construction and maintenance. Strip maps give an overall plan view of the transmission line project on relatively few pieces of paper.

Other documents, such as aerial photos or enlargements of specific areas, quadrangle maps and photos taken during route and tower type selection are utilized for the line design process.

Tower Locations

After receipt of the profiles, the Engineer commences tower spotting.

The type of towers to be used in the various sections of the line has been determined previously and shall be strictly adhered to. The Engineer will determine if existing tower loading designs can be utilized or if new loading designs will be required. For each tower type, the Engineer shall be familiar with the minimum leg length, leg length increment and the insulator string length required for proper insulation levels. Throughout the tower spotting process, abrupt changes in tower heights, especially in level terrain shall be avoided.

The obvious tower locations are at each angle point (P.I.) in the line. These locations must be maintained to keep the transmission line within the right of way.

The next step in the tower spotting process is to determine, as a first approximation, a maximum average span to use in choosing an appropriate catenary (sagging) curve. The Engineer checks for obvious loading problems such as vertical overload, transverse overload, and uplift loads as well as for obtaining more accurate catenary values for each of the spans. Adjustments are made in tower locations and/or tower heights and other adjustments necessary for an adequate preliminary line design.

Tower spotting also is done by computer. The SPOTRAN program is composed of four programs which jointly select the least expensive combination of structure locations and structure heights for a transmission line from a given set of locations, heights, and predesigned structures.

The SPOTRAN System was developed to be used in the initial design phase of a transmission line and supplies the Engineer with starting locations for each structure. The results from the SPOTRAN System must be reviewed and refined before tower staking can commence.

Tower Staking

Profiles, with approximate tower locations, are used for tower staking. Tower staking locates each tower of the transmission line in the field. The position of each structure is accurately determined by accepted surveying techniques and a one-inch iron pipe is located in the center. The top of the pipe is established and called the centerline hub elevation. This elevation becomes the basis for all future calculations involving the height of the structure.

Field Investigations

After arriving at an optimum line design, the Transmission Project Engineer shall inspect each proposed tower location to check correctness of tower staking information. If any tower site is unsuitable, an alternate site should be chosen. Upon completion of the field investigations, the Engineer shall request survey information on the alternate tower sites and proceed with final line design.

Noise and Electrical Interference

The Transmission Project Engineer shall request the Telecommunications Division of the Power Supply Department to take measurements along the entire length of the transmission right of way to establish noise levels with respect to audible noise (AN), radio interference (RI) and television interference (TVI). These measurements are to be taken prior to construction, before energizing and after the transmission line has been put in service. These measurements establish a permanent record of noise levels and are used to maintain acceptable levels of AN, RI, and TVI.

Audible noise and radio interference from transmission lines is caused by the amount of the voltage gradient on the surface of the conductor. Noise and electrical interference from 220 kV transmission lines do not appreciably affect the environment. The relatively low levels achieved are partially due to the materials used and the procedures taken during the construction of the lines. Principally, however, the levels are low because of the voltage level itself and the type of conductor configurations used on 220 kV lines. The following preventative criteria are to be used:

a. All insulator types are required to meet an established minimum RIV level.
b. All jumper loop insulator strings shall be bonded.
c. During stringing operations, the conductor shall be protected from dirt and damage.

For 500 kV transmission lines, the level of audible noise and radio interference is a determining factor in conductor size selection. To minimize these effects, the following precautionary steps are to be taken:

a. Use two sub-conductors per phase to increase the effective diameter of the conductor thereby reducing the voltage gradient on the surface of the conductor.
b. Design the lines with an optimum phase spacing to reduce the AN and RI emitted by the line.
c. Obtain a proper width right of way in order that the AN and RI outside the right of way will be minimized.

Interference with television is mainly caused by loose hardware connections in the insulator-hardware assemblies. TVI can be reduced by maintaining a minimum tension of 600 pounds in the insulator hardware assemblies.

Coordination with other Utilities and Agencies

The Transmission Project Engineer shall coordinate the line design activities with all affected federal, state, or local agencies and other private or public utilities. The Engineer shall file required reports, maps or drawings through the proper Department(s) with affected outside entities such as the Federal Aviation Administration, U.S. Forest Service, Bureau of Land Management, State Department of Transportation, county flood control districts, railroad companies, telephone companies, and other electric utilities. Should any conflict arise, the Engineer shall cooperate fully with the affected party to arrive at a mutually satisfactory solution.

Existing Transmission Right of Way

The design approach for a transmission line project on existing right of way is essentially the same as that previously discussed for *New Transmission Line Right of Way* with some exceptions or additions.

Tower Locations

Proposed or existing adjacent tower lines and locations limit the new tower locations and design. Whenever possible, the Engineer should locate new towers adjacent to existing towers. This arrangement will enhance the aesthetic appearance of the existing right of way as opposed to staggered tower locations.

The heights of the new towers should match the heights of adjacent towers when possible. If the new tower's phase spacing is different, the bottom crossarm insulator point of attachment elevations should be matched by adjusting conductor tensions within design limitations. Abrupt changes in new tower heights should be avoided.

Tower Staking

After tower spotting on the profiles has been completed and while new tower locations are being staked, adjacent tower elevations (to accurately match tower heights) should be obtained if this information is not available from other documents.

Conductor Swing Calculations

Suitable calculations shall be made to ensure that the new conductor will not normally swing out of the right of way under wind conditions and to ensure that the new and adjacent existing conductors and towers will not be in conflict under wind loading conditions.

Field Investigations

The Engineer shall check all proposed tower sites to ensure there are no conflicts with existing right of way improvements such as pipe lines, irrigation lines, ditches, existing access roads, crops, parks, distribution lines or other transmission lines.

6.b. *Transmission Right of Way*

After the general transmission route has been established through the route selection process, it is established in the field by surveyors. Control monuments consisting of a 2-inch iron pipe, concrete and a stamped brass cap are set at intervals of approximately 2000 feet. Horizontal and vertical control are established on these monuments for the preparation of photogrammetric profiles.

The control line used to prepare descriptions for acquisition of required right of way is tied to property monuments, section monuments or monuments which can be used to re-establish the acquired right. The control line is further tied to monuments which are related to the California State System of Coordinates which provides a uniform base of coordinates for all surveyors to use as reference.

The establishment of the transmission route in the field takes into account such factors as paralleling property lines and established or proposed rights of way, possible conflict with present and future right of way of others, physical terrain features to overcome possible adverse ecological effects, county or city setback ordinances, access road construction and its effect on the environment, elimination of severance damages and conformity to the general selected route.

6.c. *Access Roads*

Access roads for transmission lines may be designed strictly by the Company's standards, by governmental agency requirements, by requirements of private owners where the road traverses their property or by a combination of these requirements. Since the requirements of those other than the Company are usually unique to a project, this section will discuss only the access road engineering requirements of the Company. All design shall be in strict accordance with all appropriate authorities. Applicable city, county, state and federal requirements and codes shall be adhered to, and in the event of a conflict with the Company's normal design, they shall govern. However, where the Company's normal design is in excess of these requirements, such superior design shall be provided.

Alignment

R/W Survey will locate the road centerline and top of cut slope on preliminary plans, aerial photo strip maps, drawings, and by flags or stakes in the field. In determining the final locations, the Civil Engineer shall endeavor to save any large trees or other natural features located within the clearing area by relocating the road.

All curves shall have a radius of not less than 50 feet, measured to the centerline. To meet this requirement, the alignment may be changed or minor cutting and filling performed. Smaller radii will be acceptable on stub roads or on through roads where larger radii would require cuts or fills exceeding 15 feet in vertical height.

Grade

In general, road grade will be determined by the centerline locations. However, the groundline profile shall be leveled by cut and fill so that any maximum sustained grade does not exceed 12 percent and no individual pitch (100-200 feet) exceeds 16 percent. Steeper grades may be necessary on stub roads for locations where meeting this criteria would require cuts or fills exceeding 15 feet in vertical height.

Cross Sections

The cross section of the road shall be determined by the cross-slope of the ground perpendicular to the centerline. In relatively flat agricultural and residential areas, the roads shall be designed designating a width to be cleared of vegetation and surface compaction. Only minor earthwork should be required.

The minimum useable widths of all roads shall be increased on curves by an amount equal to 400/(radius of curvature). This requirement may be waived where cuts or fills exceeding 15 feet would be necessary to meet it.

Turnabouts on Stub Roads

All dead-end stub roads of more than 500 feet in length shall be designed with Y-type or circle type turnabouts of a quality comparable to the road.

Drainage and Erosion Control

The Civil Engineer shall designate the exact locations of all metal overside drains (see fig. 6.1), culverts (see fig. 6.2), wet crossings (see fig. 6.3), and erosion protection.

In general, dirt-type wet crossings shall be installed at all well defined drainage channels and runout-type side drains in accordance with the following table:

Average % of Road Grade	Maximum Spacing (ft.)
0 - 5	600
5 - 10	400
10 - 15	200
15 +	100

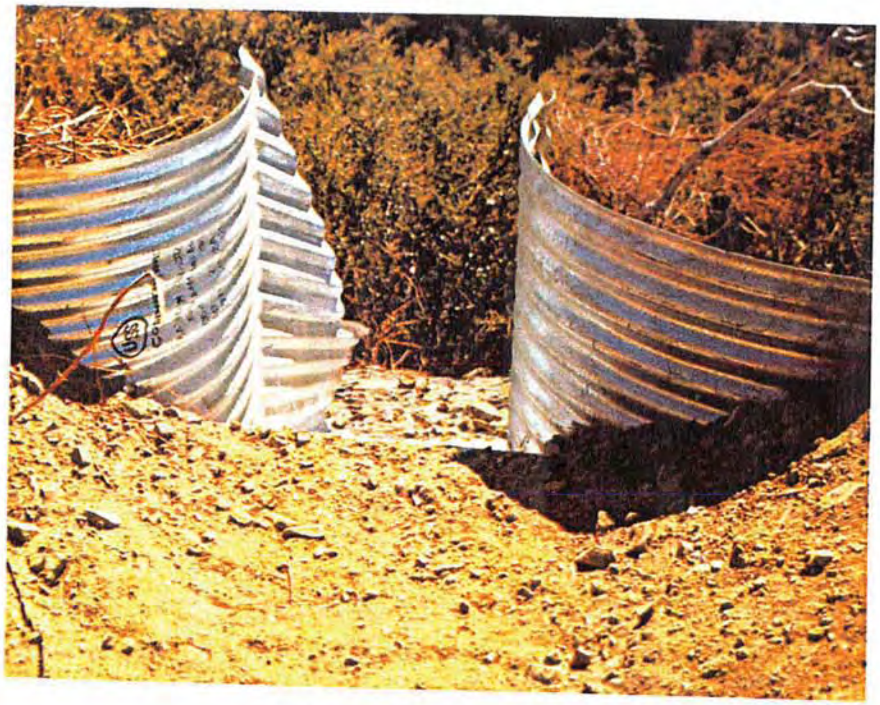


FIGURE 6.1 — Overside Drain.

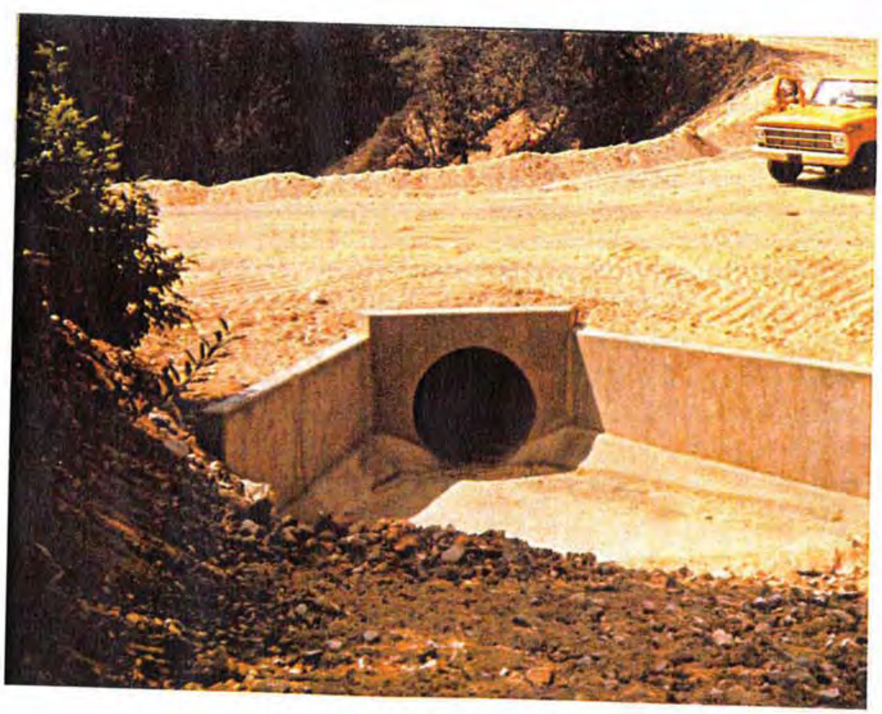


FIGURE 6.2 — Culvert.

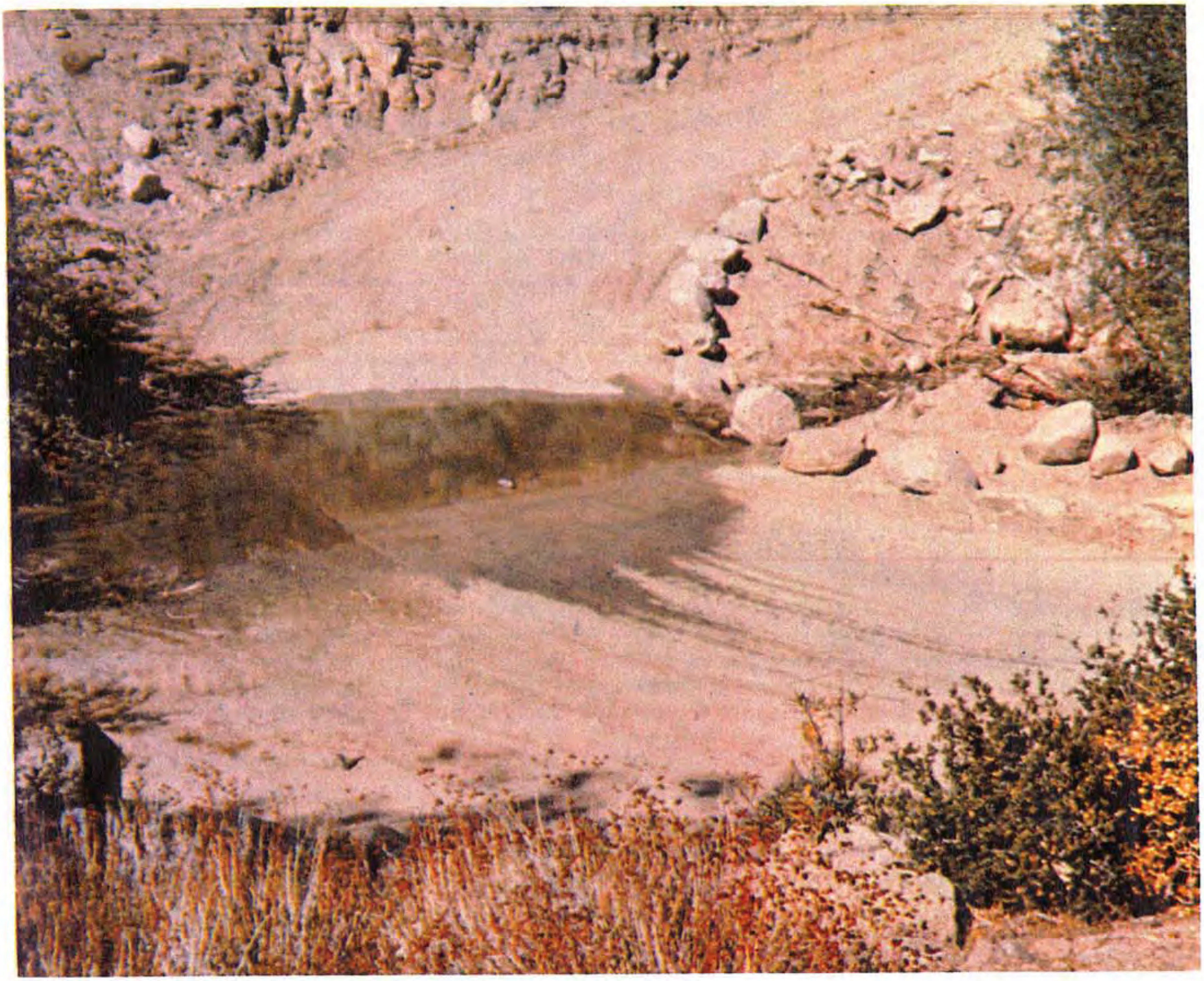


FIGURE 6.3 — Wet Crossing.

Where a proposed road interferes with existing natural drainage, all water from the high side should be transferred across the road via an applicable hydraulic structure (e.g., wet crossings, dips in road, bridges, etc.) to the lower side. Energy dissipators, such as rip-rap or gabion blankets (see fig. 6.4), shall be used to eliminate the possibility of erosion.

Berms shall be provided on the fill side of the roads to control the flow of water. Overside drains shall be provided to carry this water over these slopes and its energy dissipated before flowing over natural slopes.

Earthwork

Excavation and embankment will be permitted only on areas cleared and grubbed, and where refuse is disposed of or piled outside the road prism.

The cut and fill operations shall be designed to minimize sidecasting of earthwork material. Benching should be minimized since this creates an adverse visual impact.

Embankment Slope Treatment

Slopes shall be seeded or straw shall be incorporated into the soil to prevent erosion.

FIGURE 6.4 — Gabion During Rock Fill Operation.

7. CONSTRUCTION

Conservation Construction Plan

A Conservation Construction Plan relevant to the preservation of the environment will be prepared and implemented when necessary for each transmission line project that requires an Environmental Impact Statement. (see Example 7.1).

The Transmission Construction Superintendent for Edison construction projects and the Project Construction Engineer on contract construction shall be directly responsible for the initiation and implementation of the conservation plan. A preliminary draft must be prepared and submitted to the Manager of T/S Construction for approval at least 30 days prior to start of construction by Edison Forces to allow for review and alternate plans, if required.

EXAMPLE 7.1
GUIDELINES AND REQUIREMENTS FOR THE CONSERVATION CONSTRUCTION PLAN

I.

The Environmental Impact Report will reference specifics on vegetation cover, wildlife habitants and areas of unique archaeological and historic significance and when appropriate will provide definitive instructions for their preservation and protection during construction.

II.

The Conservation Plan shall provide, as necessary, information or methods of conservation to be used during the construction phase of the following components and related items.

A. CLEARING OPERATIONS
1. Specific tower sites.
2. Conductor clearance.
3. Access roads, permanent and temporary.
4. Shop and storage areas.
5. Disposal of cleared material, burning, chipping, etc.
6. Dust control.
7. Noise abatement.
8. Areas to avoid due to wildlife habitat.
9. Areas of archaeological and historic significance.

B. SHOP AND STORAGE FACILITIES
1. Locations.
2. Sanitation facilities.
3. Parking areas.
4. Visual impact on the area.
5. Equipment repair areas.
6. Dust control.
7. Noise abatement.
8. Demands on community services.

C. ACCESS ROADS
1. Use restrictions on existing roads.
2. Location in relation to reservoirs, streams, wildlife habitants and areas of archaeological and historic significance.
3. Permanent vs. temporary. Temporary roads will be obliterated after construction is completed.
4. Roads on private property; name and phone number to contact.
5. Federal and State lands and who to contact.
6. Dust control.
7. Erosion control.
8. Restricted use, in populated areas.
9. Earth disposal. (This includes sidecasting, endhaul and disposal areas.)
10. Benching, cuts and fills.
11. Visual impact on the immediate and surrounding areas, including the size and location of the affected areas.

D. TOWER FOUNDATIONS
1. Excavation, material disposal and blasting controls.
2. Dust control.
3. Erosion control.
4. Concrete haul. Also included would be the disposal of unused concrete and the washing out of the drum after the pour. (Provide designated areas as necessary).
5. Benching operations prior to excavation for footings.

E. TOWER ASSEMBLY AND ERECTION
1. Steel haul and storage.
2. Steel tower assembly at the tower sites.
3. Grading work to construct a crane pad at each individual tower site.
4. Possible sites for construction by helicopter.

F. GOOD HOUSEKEEPING PRACTICES
1. Shop and storage facilities.
2. Work areas.
3. Right of way.

G. POST-CONSTRUCTION CLEAN-UP
1. Removal of construction facilities.
2. Removal and disposal of all debris.
3. Erosion control.
4. Reseeding (where required).

For contract construction, the conservation plan shall be an attachment to the bid package and will be approved by the Manager of T/S Construction. Preparation of the plan will be from first-hand knowledge by a right of way and site inspection with input from the Company's Environmental Staff, District Managers, private property owners, and relevant regulatory agencies.

In order to be used effectively by the foreman in the field, instructions must be explicit when only one method of operation can be used. Where various methods of construction are acceptable and the decision can be made directly in the field, instructions should allow flexibility.

Contact will be made with local residents and property owners directly affected to inform them of the planned project and what may be expected during the construction phase, such as hours of operation and types of construction equipment to be used in the area. Potential problems will be documented as part of the conservation plan and a solution implemented where possible.

To emphasize the priorities intended, and to establish a positive approach to meet the environmental goals for each project, the Project Construction Engineer, Superintendent or General Foreman will participate in a conference with all field construction forces to assure that each crew member is made aware of his individual responsibility. An inspection program will function throughout the construction period under the supervision of the Project Engineer or General Foreman to assure that these goals are being met.

General Conditions

Vehicular traffic shall be limited to approved access roads and construction sites as shown on strip maps, and no vehicle shall travel beyond the limits of these areas unless absolutely necessary.

All tower sites, material storage yards and access roads shall be maintained in an orderly appearance. Trash disposal shall be conducted on a regular basis as required by local ordinance.

Water trucks shall be used to control dust problems whenever it is a public nuisance to neighboring residents and agricultural developments. The use of oil for dust control must have prior approval.

Noise producing equipment should be located to minimize the radiation of sound to the surrounding neighborhood, especially when using the chipping machine for tree disposal. If the use of pneumatic tools or equipment in the vicinity of residential properties is necessary, such use shall be restricted to daylight hours.

During construction of transmission lines in areas where fire hazards exist, all vehicles and gas-powered equipment shall be equipped with spark arresters. Where necessary, a fire patrolman will be on the project with a pumper-equipped pickup truck and fire-fighting equipment will be located in cache boxes along the right of way at strategic points. All welding, grinding operations and smoking privileges will be controlled in fire-danger areas. When the weather conditions create an extreme fire danger, construction operations will be limited or curtailed as directed by the U.S. Forest Service or other governmental agency. The Construction Engineer or General Foreman shall establish a project fire plan and all project personnel shall be instructed as to their individual responsibilities.

Designated archaeological areas will be indicated prior to start of construction, and all personnel shall be instructed to report all findings suspected to be important. Extreme care will be taken to avoid destruction of artifacts and historical features.

Location of shop and storage facilities shall be determined with consideration to the visual impact from major travelled roads and the local community. Fully contained sanitation facilities shall be provided in metropolitan areas to prevent and contamination to water tables or local streams. Parking areas shall be arranged to minimize the amount of clearing necessary. Equipment repair areas shall be located such that night work will not infringe upon local residents.

7.a. *Transmission Lines*

Right of Way Clearing

All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall not unnecessarily be disturbed and shall be protected by steel stakes, wire fence, or bright colored flagging as necessary. Trees and brush will be cleared only when needed to provide electrical clearance, line reliability or suitable access for construction and maintenance. No surface grading, cuts, fills, or benching operations will be done unless absolutely necessary. Straight line clearing for access roads will be avoided wherever possible to minimize visual impact and aid in erosion control. In and near residential areas, noise levels will be kept to a minimum, especially in chipping operations during tree removal or trimming. Areas noted in the conservation program as wildlife habitats will be indicated and, where possible, not disturbed.

No cleared material will be left piled on hillsides, along roadways, or in any areas that have not been approved for such purposes. If approved by the agency controlling the area, brush, timber and other wood products may be disposed of by chipping or shredding, and dispersed to serve as mulch, rather than burned.

Tower Foundations

During the excavation for tower foundations, no benching will be done unless required to meet footing projections required by the specifications (see fig. 2.2). Excavations for foundations shall be protected until placement of concrete. Material from the excavation will be either removed or spread out to conform to the natural contours of the areas. Dust control will be implemented in all phases of tower footing construction as necessary. Blasting control will be in accordance with local, state and federal regulations. During concrete placement, disposal of unused concrete will be restricted to areas designated for this purpose.

Steel Tower Assembly and Erection

During tower steel haul, particular attention will be given to the maintenance of access roads due to heavy loads and long truck trailers on narrow roads with short radius curves. In tower assembly, care will be taken to minimize damage to trees or shrubs left at the tower sites. When tower erection is by conventional cranes, and grading operations are required to install crane operating pads, cuts and fills will be kept to a minimum, consistent with safe operating practices. After tower erection, the tower site will be restored to a condition as near to the natural terrain as is reasonably possible. Erosion control methods shall be implemented as soon as practical.

In mountainous terrain or areas of scenic or historical significance where access road construction would result in permanent damage to the environment, consideration will be given to the use of helicopters for certain phases of construction.

Conductor Stringing

Set-up locations for wire stringing equipment will be planned in conjunction with the layout for access roads. Where possible, the access roads will be routed adjacent to the set-up areas to minimize the need for additional clearing for stub roads.

Conservation measures will be implemented as soon as practical in the set-up areas after removal of equipment. During wire pulling operations over vegetated areas, the sag of the conductor will be maintained at a height necessary to minimize plant damage. The helicopter will be used for stringing in small conductor pulling lines and conductor wherever practical.

7.b. *Access Roads*

Clearing operations will be in accordance with the requirements outlined for transmission line clearing.

Maintenance of access roads during construction shall include dust and erosion controls where necessary.

Permanent access road construction shall adhere to the requirements of the appropriate governmental agencies or private property owners concerned. Good erosion control practices will be followed during construction. Damage to existing access roads will be repaired. In constructing temporary access roads, consideration will be given to the restoration required after completion of construction, which will include reseeding, rock cover, etc. Clearing or grading will be minimized. Metal downdrains will be provided where needed. If significant water flows cannot be spread into vegetated areas, dissipators will be installed. Access roads should follow the natural contour of the land where possible, thereby minimizing permanent scarring of the area. The visual impact of the access roads on the immediate and surrounding areas will be considered at all times during construction.

Upon completion of construction, damage to access roads shall be repaired and erosion control implemented where necessary.

Storage, repair areas, and rights of way shall be cleaned and restored as near as reasonably possible to their original condition. Cleaning and restoration will include removal of surplus buildings and equipment, lumber refuse, fencing or any other items not to be used after construction. Any drainage deficiencies occasioned by our activities will be corrected to prevent erosion, and cut and fill areas will be restored approximately to their pre-construction condition. Where necessary, revegetation of specific areas will be performed after construction.

8. OPERATION AND MAINTENANCE

8.a. *Transmission Lines*

All transmission lines shall be patrolled at least every 90 days to visually inspect the facilities and make any necessary repairs to assure the integrity and reliability of the system. More frequent patrols shall be made during hazardous periods such as fire or storm seasons. In urban areas, the patrolling shall be performed by vehicle on the ground. A helicopter is generally utilized in rural and mountainous areas. All lines must, however, be patrolled at least once a year on the ground for a more detailed inspection. Special care shall be exercised during the patrol so as not to frighten wildlife, livestock, or poultry as well as minimize noise and dust levels.

Contamination caused by industry, automobiles, salt spray and other natural pollution is very high in urban areas and requires the Company to frequently wash insulators to keep insulation capabilities at a high level. Contamination is monitored so that insulator washing can be timed most effectively. Extreme care is exercised during insulator washing so as to avoid disturbing the public.

Transmission lines may emit audible and radio noise if not properly maintained. Regular maintenance keeps the noise at a low level. On occasion, property owners complain of radio or television interference. The vast majority of complaints received are caused by customer-owned devices. Those that are traced to line hardware or contamination problems are remedied immediately by maintenance crews. All complaints shall be investigated by the Company.

8.b. *Transmission Right of Way*

For the last several years, the Company has been engaged in a program to improve the appearance of transmission line rights of way particularly at street crossings in metropolitan areas. This work involves the planting of low-maintenance shrubs and the installation of fences to screen the rights of way from street areas and make them more compatible with the surrounding areas.

Clearing is performed on rights of way in metropolitan areas where there are no secondary uses under license and shall be confined to periodic mowing to control weed growth as necessary. Trees are to be trimmed only to the extent required to maintain line reliability. In outlying and mountainous areas, clearing and tree trimming shall be performed on a selective basis to reduce fire hazard and maintain the surroundings as near to their original state as possible. All right of way clearing and tree trimming operations shall be in strict conformance with appropriate regulations.

Secondary Use of Right of Way

All secondary uses with license agreements are subject to CPUC General Order No. 69B.

The secondary use licenses are primarily agriculture, horticulture (nursery stock), Christmas tree farms, citrus groves, landscaping and parks (county and city), pasture and grazing and riding and boarding stables (see figs. 8.1 through 8.10).

All secondary uses shall be compatible with Company operating requirements (existing and proposed construction) and maintenance. These uses shall be approved by the Transmission Superintendent having jurisdiction, who will determine the requirements to be imposed on the proposed use. These requirements may include access roads, gates, additional fencing, drainage and storage locations. Tenants are responsible for weed, pest and dust controls, access roads and parkway maintenance. If applicable, the license agreement specifically provides that the

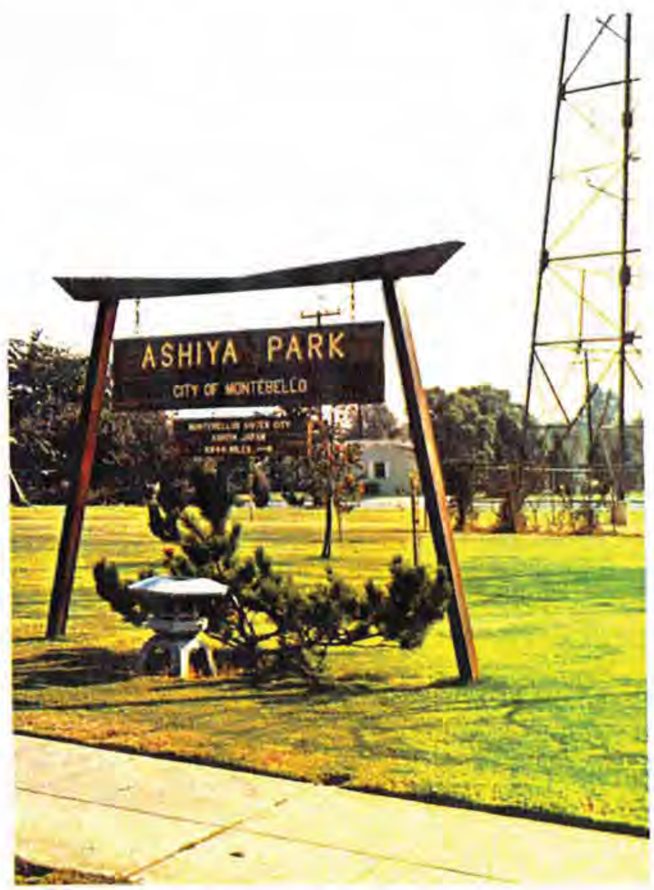


FIGURE 8.1
R/W Used for Park.

FIGURE 8.2
Christmas Tree Farm on R/W.

FIGURE 8.3
Pepper Growing on R/W.

tenant will comply with all rules, regulations and orders of the state and county horticultural commissions regarding methods of pest control, weed abatement and replenishment of soil nutrients.

All secondary uses shall be compatible with the neighborhood. The expertise of the Property Management Agents normally is relied upon in this instance. Where there is doubt that the proposed use is compatible, the agent shall obtain a recommendation from the Local Area Manager. All usage is in accordance with local zoning.

Some secondary uses, such as Christmas tree farms and retail nurseries, require exposure to traffic. Conversely, some uses, such as horse stables, require buffer strips to shield the view.

The Company's secondary use program has contributed most favorably to the environment by providing green belts in the congested metropolitan areas. Where rights of way are used for nurseries and Christmas tree farms, noise level is reduced. The program is a joint effort involving Edison and its tenants. Where necessary, Edison provides landscaping material for screening the right of way at street crossings. The tenant plants the material and is responsible for its maintenance.

8.c. *Access Roads*

Access roads shall be maintained as near their original state as possible. Crews shall not deviate from alignment or grade of established roads while performing maintenance work, and vehicles shall not wander off existing access roads.

All gates shall be closed and locked after each entry or exit therefrom.

During the course of maintaining transmission lines and patrol roads, all personnel involved shall make every effort to become aware of and protect all endangered species of plant and wildlife.

Weed control products and herbicides shall be used only in strict compliance with the regulations of the local entity having jurisdiction.

Patrol crews shall work closely with representatives of the U.S. Forest Service, the Bureau of Land Management, and other regulatory agencies in arriving at mutually agreeable solutions to access road problems.

Prevention and control of soil erosion within the right of way and adjacent lands is of prime importance in access road maintenance activities. Where feasible, all cut or fill slopes shall be kept vegetated with a suitable species of ground cover to prevent future erosion.

Material from slides and other sources requiring removal from the road shall not be deposited in streams or stream channels, nor sidecast onto vegetated slopes or at locations where it will erode or wash into streams and cause damage through silting of streams and reservoirs.

During dry weather, adequate dust control measures shall be taken as necessary to prevent damage to surrounding properties.

When work is performed in an area covered with flammable grass, brush, or trees, personnel shall use every precaution against starting fires. Such precautions shall include, but not be limited to; prohibiting smoking on the job, using spark arresters on equipment exhausts and providing portable fire-fighting equipment, shovels and axes at all sites where work is in progress, and in vehicles carrying crews in transit.

Extensive repairs and/or relocations shall follow the same directives as for new construction.

All contractors working for the Company shall be governed by the same practices and procedures as outlined herein.

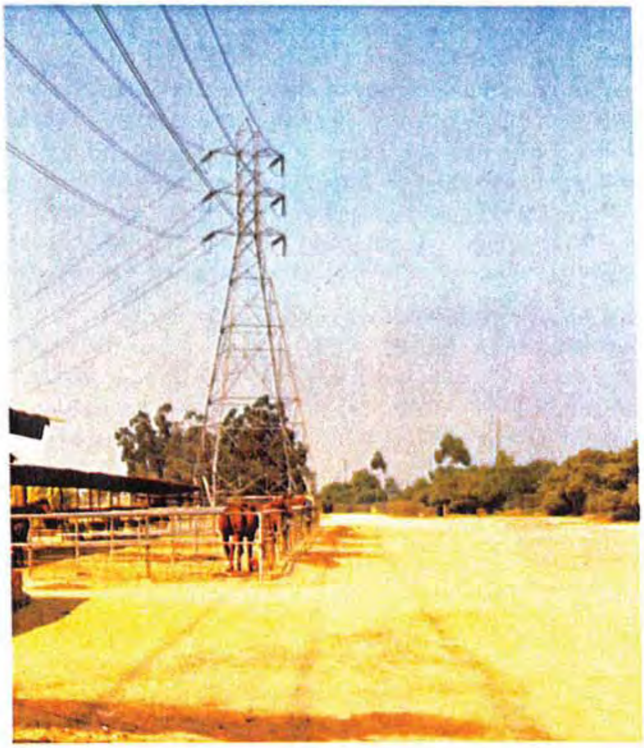


FIGURE 8.4
R/W Used for Horse Stables.

FIGURE 8.5 — Miniature Golf Course on R/W.

FIGURE 8.6
Wholesale Nursery on R/W.

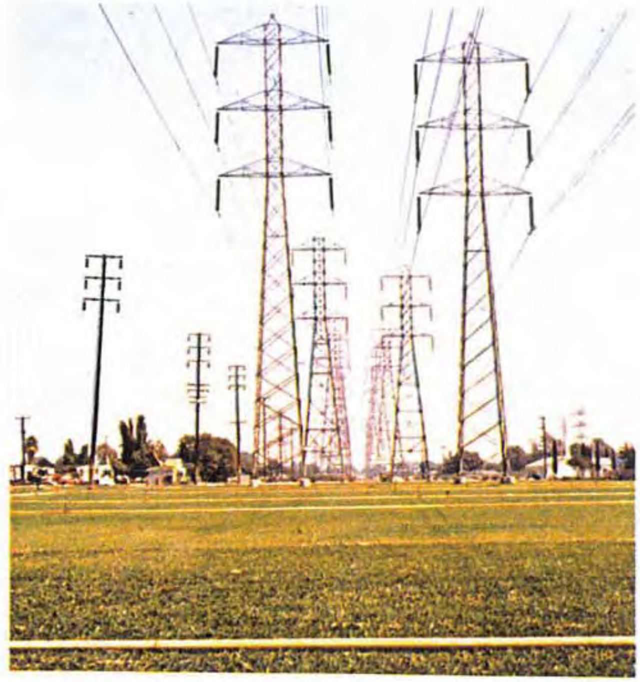


FIGURE 8.8
Grass [Sod] Growing on R/W.

FIGURE 8.7
Lemon Grove.

FIGURE 8.9
Strawberry Farm.

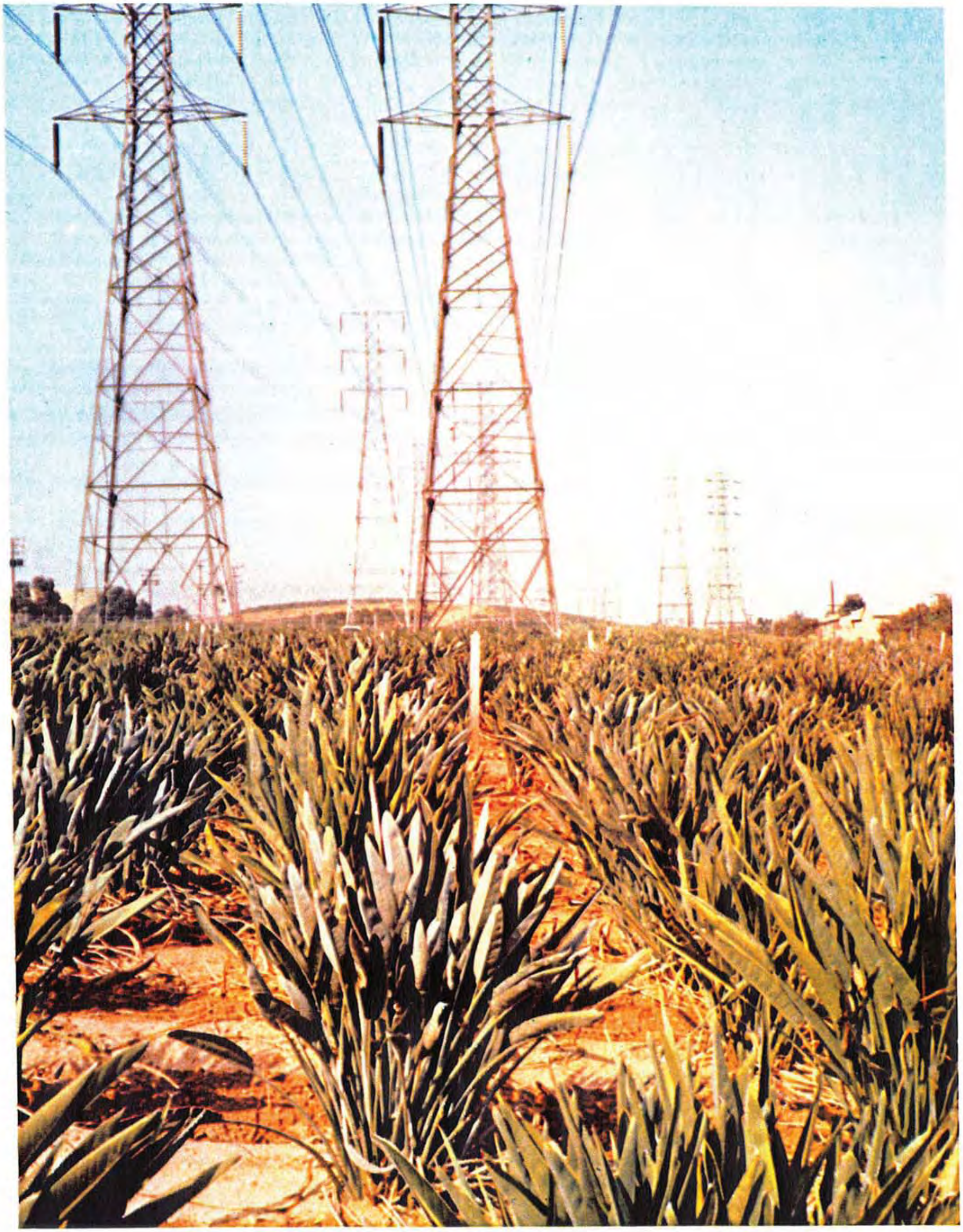


FIGURE 8.10 — Bird of Paradise Growing on R/W.

GLOSSARY OF TERMS

ACSR — Aluminum conductor steel reinforced. Steel strands form a central core, around which are layers of aluminum strands. Various tensile strengths, current capacities and conductor sizes are obtained by using different combinations of steel and aluminum.

AMBIENT TEMPERATURE — The temperature of the surrounding air.

AN [AUDIBLE NOISE] — Buzzing or hissing sound emitted by a transmission line which increases during foul weather such as heavy rain or snow.

BENCHING — A horizontal plane on a sidehill or slope made by cutting (grading). A berm of soil above a drainage ditch. The leveling of a site to form a horizontal plane for foundation installation.

BERM — Horizontal ledge at top or bottom of an earth bank. A relatively small bank serving to control or direct drainage. A ledge or shoulder along the edge of a paved road.

BORROW PIT — An excavation dug to provide fill (soil or gravel) elsewhere.

BUNDLED CONDUCTOR — A group of two or more conductors of the same phase and polarity supported by the same insulator string.

CIRCUIT — A conductor or system of conductors through which current is intended to flow.

CORRIDOR CONCEPT — An area through which utility lines pass and which is bounded by much larger areas through which no utility lines pass.

CROSS SLOPE — A slope or bank in direction perpendicular to the traverse of a road.

CULVERT — A covered channel or pipe for carrying water below ground level as under a road.

CUT AND FILL — Road method of construction partly above and partly below existing ground level by adding or removing material.

DOUBLE CIRCUIT TOWER — A tower capable of supporting two circuits.

FLASHOVER — An electric arc produced by a voltage exceeding the rating of an insulator string across which the arc occurs.

GABION OR GABION BLANKET — Cubical wire baskets filled with cobbles and gravel used as slope stabilizers and erosion protection for banks of rivers, roads, etc.

GRADIENT — The fall or rise per unit horizontal length of road. Usually expressed as per cent (e.g. $10\%\ g = \frac{10'}{100'} \times 100\%$).

GREASED CONDUCTOR — A conductor with the voids between the strands filled with grease.

GUYED TOWER — Tower supported by a tension member (a solid wire or stranded wire) to withstand an otherwise unbalanced force on a tower.

INSULATOR STRING — A string of porcelain units in series which support the conductors on transmission towers and insulates them from electrical ground. These units may be in a vertical, horizontal or a vee string configuration or arrangement.

ISOKERAUNIC LEVEL — Refers to the number of thunderstorm days per year.

KCM — One thousand circular mils. A circular mil is a unit of cross-sectional area equal to the area of a circle one mil (.001 inch) in diameter.

LATTICE TOWER — A tower fabricated from many structural steel members (usually angle sections) by lacing between members. Also called laced tower since members are "laced" together.

LINE DEFLECTION ANGLE — Change in route direction of the transmission line measured in degrees, minutes and seconds.

LINE OUTAGE — The de-energization of a transmission line whereby both voltage and current are reduced to zero, and power ceases to be transmitted.

MULTIPLE CIRCUIT TOWER — A tower capable of supporting more than one circuit. Usually refers to more than two circuits.

NON-SPECULAR — A matte, dull, light gray surface usually obtained by mechanically blasting the conductor surface.

OVERSIDE DRAIN — A drainage device installed for erosion protection to a road and/or its embankment. It starts at edge of the road and is directed down slope.

QUADRANGEL MAP — A detailed map that is made by photogrammetric methods and aerial photographs, edited and published by the United States Geological Survey, Denver, Colorado or Washington, D.C.

RECONDUCTORING — Replacing conductor.

RIGHT OF WAY — A strip of land used primarily for carrying utility lines.

RI [RADIO INTERFERENCE] — Interference affecting radio reception as a result of the voltage gradient on the surface of a transmission line conductor exceeding a critical value.

RIV [RADIO INFLUENCE VOLTAGE] — The voltage which appears on the conductors of electrical equipment or circuits, as measured with a standard radio noise meter.

RIP-RAP — Protective cover of stones (15# to 150# each) used for scour protection of slopes.

SIDECASTING — Disposal of fill from road grading by casting to the sides.

SINGLE CIRCUIT TOWER — A tower capable of supporting only one circuit.

SPAN — Horizontal distance between adjacent supporting points of a conductor.

SUBCONDUCTOR — One conductor of a bundled group of conductors.

SYSTEM TERMINALS — Points at which the transmission line is terminated (substations)

SYSTEM VOLTAGE — The highest effective voltage between any two conductors of a circuit.

TRANSMISSION LINE — A line of structures and conductors used for transporting electrical power.

TRANSMISSION SYSTEM — An arrangement of transmission lines, substations, and generating stations used for delivering bulk power.

TVI [TELEVISION INTERFERENCE] — Interference affecting the picture of a television receiver as a result of precipitation on a transmission line conductor or loose hardware connections.

VOLTAGE GRADIENT — Intensity of an electric field usually expressed in kilovolts per centimeter (KV/CM).

WET CROSSING — A cross-road drain device which allows flow of stream or river. The water level is usually near finished road grade level.

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Appendix 6

Segment Scores and SME Comments

Route Scoring Worksheet - Aesthetics

Riverside Transmission Reliability Project

Segment	Visual Character / Quality	Locally-Valued Places	Impacts to Scenic Vistas	Scenic Highways	Comments
A	3	1	2	1	Existing residential development on the north side of Limonite, and is currently ongoing on the north near the I-15. Viewshed is from the I-15 and Limonite in that the landforms are generally uniform with expansive views.
B	3	1	1	1	Residential on the north side is close to the roadway with soundwall and trail. Residential on the south side is farther south. This segment cannot be seen from the I-15 and Limonite; Well developed intersection at Etiwanda and Limonite, which includes commercial uses.
C	3	1	1	1	Residential on the north side is close to the roadway with soundwall and trail. Residential on the south side is farther south. This segment cannot be seen from the I-15 and Limonite. Corner of Etiwanda and Limonite has updated commercial uses. East of the intersection, there are some small businesses in older structures.
D	3	1	2	1	Nice view of the SAR from this segment.
E	3	1	2	1	Residential on north side - sparse large lots, rural uses. Clear view of the SAR on the south side.
F	3	1	2	1	Rural residential adjacent to the flood control channel. Low-income neighborhood. While there are no scenic viewsheds, the flood control channel provides a sense of separation in the neighborhood, and a feel of openness.
G	3	2	2	1	This small section abuts the gof course on the east and rural residential on the west. Utilities come in from the golf course on the south end, and turn east, while distribution continues up the street. Golf course on east also host to flood control channel and nice wooden bridge. This element provides an upscale element to this neighborhood.
H	3	2	3	1	This section is on the golf course and is designed to utilize the existing alignment in the Golf Course.
I	4	2	3	1	The section would go behind homes, hugging the SAR and residential interface. Existing distribution currently in this area. Residences and ends of several streets offer expansive views of the SAR - however, view includes existing 66/distribution poles in the SAR. Adding 220 kV structures would be a significant change in the currently relatively "low-key but developed" viewshed.
J	4	1	1	1	This segment will bisect the golf course in an additional alignment, and then on the south side of 68th Street. Would eliminate the developer's proposed trail. The street is wide, and contains 66 kV on the north side, where there is a school. The 220 kV poles would
K	4	4	4	1	This segment abuts the golf course, future homes and the SAR. The pristine nature of the area would represent a change. However, given the golf course and the proposed housing development, it would not be inconsitent with fuure development. The golf course is nice and peacful - not sure if corona noise and the presence of the poles in the Golf Course would be compatible. Recommend putting poles immediately on the other side of the golf course, more on the SAR side, and shurbs to visually hid the bases. This may provide a "visual separation" between the golf course and the towers. In the area of the proposed development, residences are proposed for several hundred feet away from the proposed route. The towers may blend into the landscape. Perhaps use of lattice in this area would help retain the visual affect.
L	4	3	3	1	SAR is scenic area, but existing 66/distribution poles are present.
M	3	2	1	1	Bain Street is relatively wide and open due to a flood control channel running north-south. A trail is on the west side; a school is located on the east side. The lots are rural residential in nature, but are relatively small.
N	2	2	1	1	Bellgrave is relatively light-industrial in nature, with a school and a sports park; residential on the south side. Heavy ag on the north side past Etiwanda.
O	1	1	1	1	The parking lot of Union Pacific provides no aesthetic value
P	1	1	1	1	The area is industrial in nature and has existing 66 kV lattice towers on south side. The street is wide and open.
Q	1	1	1	1	The parking lot of Union Pacific provides no aesthetic value
0					

Route Scoring Worksheet - Aesthetics

FACTORS

Visual Character / Quality	
1	Heavy industrial structures, existing above-ground utilities, and / or visually-cluttered landscape.
2	Light industrial area or intensive agricultural landscape character. Existing above-ground utilities.
3	Route segment is on a local roadway and/or through a residential area with above-ground utilities. Or, segment is in an area with a mix of residential and commercial uses. Or, segment is in an area that has a rural landscape character.
4	City / County Architectural Development Standards apply to the properties surrounding the segment; segment is within a residential area; or, segment is in an urban / rural interface area (e.g. wildland urban interface), or an area with a pastoral landscape character.
5	Route segment is within a pristine environment with view corridors or naturally evolving landscape character; or residential area with lots of existing or future vantage points. Segment is in an area with no above-ground utility structures.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Sources include field visit; Review City Planning site for Architectural Development Standards; Review Zoning Code for landscape ordinances - would indicate aesthetics as a priority.

Locally-Valued Places	
1	Proposed route segment is not visible from an identified or eligible place, landmark or structure in CRHR or identified in the City / County General Plans as a place of relevance.
2	There is an identified or eligible place, landmark or structure in the CRHR, or identified in the City / County General Plans as a place of relevance within the vicinity of the proposed route segment but but man-made visual clutter and / or natural terrain would completely block or obscure view of the site from the place of relevance.
3	There is an identified or eligible place, landmark or structure in CRHR or identified in the City / County General Plans as a place of relevance within the vicinity of the route segment, but not directly adjacent to the segment. The view of the segment from the place is partially or largely (but not completely) obscured by man-made visual clutter and / or natural terrain.
4	Proposed route segment is in the vicinity of and partially to wholy visible from an identified or eligible place, landmark or structure in CRHR or identified in the City / County General Plans as a place of relevance. While visible from the place, the segment is not directly adjacent to the place of note.
5	Proposed route segment would directly impact or is within 100 feet of an identified or eligible place, landmark or structure in CRHR or identified in the City / County General Plans as a place of relevance.
F	Does not meet project objectives (Provide detailed explanation).

Impacts to Scenic Vistas	
1	No impacts to any viewsheds or scenic vistas.
2	Minor change to undesignated scenic vistas or viewsheds.
3	Minor change to designated scenic vista or viewshed or moderate change to undesignated scenic vista or viewshed. Consider number of residential or recreational viewers of the project.
4	Site would partially block view of officially designated scenic vista or viewshed. (list the specific designation and designating agency). Consider number of residential or recreational viewers of the project.
5	Blocks or markedly impedes officially designated scenic vista or viewshed (list the specific designation and designating agency). Site is in the foreground view of large number of viewers who would otherwise / also be viewing th scenic vista.
F	Does not meet project objectives (Provide detailed explanation).

Scenic Highways	
1	There is no scenic highway or corridor w/in the project area or the route segment is not in the viewshed / is fully obscured from view of a locally-designated scenic corridor or road.
2	There is a scenic highway (eligible or designated State, County or Federal) within or adjacent to the project area, but man-made visual clutter and / or natural terrain would completely block or obscure view of the route segment from th
3	The route segment can be seen from an eligible (but not designated) scenic highway, but existing visual clutter, built environment, or natural terrain would partially obscure views of the segment from the scenic highway. Segment
4	The route segment is located along or is adjacent to and fully visible from a locally designated scenic corridor or road, or an eligible but not designated State scenic highway; or, it is present and visible (but not adjacent to) and can be
5	Route segment can be seen from or is along a scenic corridor, or along a Caltrans Designated Scenic Highway, and/or a highway that is proposed for listing, or is listed, on the National Register of Historic Places, or California Register
F	Does not meet project objectives (Provide detailed explanation).

Route Scoring Worksheet - Biology

Riverside Transmission Reliability Project

Segment	Wildlife Corridors	Avian Collision	Permit Time Required	Water Bodies	Special Status Species	Comments
A	1	1	1	1	1	
B	1	1	1	1	1	
C	1	1	1	1	1	
D	1	1	1	1	1	
E	1	2	1	1	2	
F	1	1	1	1	1	
G	1	2	1	1	1	
H	1	2	1	2	2	
I	1	2	1	2	2	
J	1	1	1	1	1	
K	3	4	2	3	4	(assume30 ft disturbed between golf course and terrace) Nesting season restriction. Critical habitat for Santa Ana Sucker and Least Bell's vireo. Potential for Santa Ana woollystar. Permits needed via MSHCP participation
L	4	5	2	5	4	Presence of Santa Ana sucker, Least Bell's Vireo, riparian nesting birds, Santa Ana woollystar. Critical habitat for Santa Ana sucker and Least Bell's vireo. Potential need for riparian vegetation removal. Nesting season restricitons, Permits needed via MSHCP participation
M	1	1	1	1	1	
N	1	1	1	1	1	
O	1	1	1	1	1	
P	1	1	1	1	1	
Q	1	1	1	1	1	
0						

Route Scoring Worksheet - Biology

FACTORS

Wildlife Corridors	
1	No wildlife movement; (Project surrounded by developed areas with no habitat, project area does not connect habitat or open space areas)
2	Low potential for wildlife movement. (eg. Disturbed or low quality habitat in project area with limited connection to other habitat areas)
3	Moderate potential for wildlife movement (e.g. Project area provides connection to other habitat areas)
4	Moderate potential for wildlife movement and project will not significantly impede movement (eg. Project area connects native habitat and project will not significantly impede wildlife movement project area is in known or designated wildlife
5	High potential for wildlife movement and project will impede wildlife movement; (eg. Project area connects native habitat and project will impede wildlife movement, project area is in known or designated wildlife corridor)
F	Does not meet project objectives (Provide detailed explanation).
Avian Collision	
1	No collision risk (eg. Developed areas; not in bird flight path or critical habitats)
2	Low potential for collision risk (eg. Low use by birds, habitat quality low)
3	Moderate potential for collision risk (Line will be placed in existing ROW; Line is in proximity to where birds are landing and taking off. Other transmission lines already exist in proximity to proposed line with no known issues).
4	Moderate potential for avian collision (Line divides roosting and feeding habitats; Line is in close proxilmity to where birds are landing and taking off. No other transmission lines in area.)
5	High Potential for avian collision (eg. Line divides roosting and feeding habitats; Line is in proximity to where a high concentration of birds aree landing and taking off. No other transmission lines in area)
F	Does not meet project objectives (Provide detailed explanation).
Permitting Time Required	
1	Approx. 1 year or less permitting required
2	Approx. 2 years or less permitting required
3	Approx. 3 years or less permitting required
4	Approx. 4 years or less permitting required
5	Approx. 5 years or less permitting required
F	Does not meet project objectives (Provide detailed explanation).
Water Bodies	
1	No known water body within 500' of site
2	Waterbody within 500' of site, no vegetation or habitat for listed species, potential indirect impact
3	Water body within 500' of site, riparian vegetation present, no/low potential for listed species
4	Within jurisdictional waterway. No/low potential for listed species. Potential direct impacts.
5	Within a jurisdictional waterway, has listed species, potential direct impacts
F	Does not meet project objectives (Provide detailed explanation).
Special Status Species	
1	No known biological sensitivities, disturbed land (e.g. No T&E or sensitive species (sp. of concern or CNPS list, wetlands)
2	Some potential biological sensitivities, potential for permit (e.g. Potential for sensitive species, no T&E species, lower quality habitat)
3	T&E species likely to be in general area, medium to good quality habitat (e.g. Potentially suitable habitat, no T&E species from CNDDB in project area, but T&E species in adjacent areas)
4	Has T&E species, requires species specific surveys.Permit likely with mitigation (e.g. T&E species present, species specific surveys, permits likely and mitigation)
5	T&E species, extensive mitigation, likely opposition; alternative site recommended (e.g. T&E species, extensive mitigation, permit difficult to aquire)
F	Does not meet project objectives (Provide detailed explanation).

Route Scoring Worksheet - Civil Engineering

Riverside Transmission Reliability Project

Segment	Access/Grading for O & M	Overall Terrain	Access and Grading for Construction	Permits and Restrictions	Surface /Subsurface Obstacles (Visual Only)	Comments
A	3	1	3	1	3	Some disturbed areas along route north of Limonte, but new permanent roads needed. Over-ex/scarify most likely needed. 1/10 in parking lot has good construction access. Storm drain inlet? Midspan on north side of Limonite. Cover needs to be adequate if there is underground pipe. Sout side of Limonite will require new ingress/egress location as well as new through road. Terrain is flat. Approximately 1500' of new road.
B	3	1	3	1	1	Some disturbed areas along route, but new ingress/egress needed. Over-ex/scarify most likely needed. Terrain is flat, but has vegetation. Area is not graded, so possible standing water. 1/4 is in parking lot. Good construction access. Approximately 2500' of new road
C	3	1	3	1	1	Depending on pole locations, acquisition of access rights will be needed from private owners. If lot is developed, permanent access road will be difficult. Based on Google Earth imagery (6/7/12) approximately 1000' of new road may be needed.
D	1	1	1	1	1	Exising disturbed access road paralells proposed route. May only require stub road at pole locations. Existing road may need to be over-ex/scarified.
E	4	1	4	1	1	Some existing unpaved roads in the area. May be possible to have only stub roads (pending easement info and final pole locations). Existing roads may need to be widened, improved, over-ex/scarified. Some drainage concerns due to proximity to river.
F	1	1	1	3	3	Flood control channel access road. Depending on pole location, drilling may be an issue. If pole foundation encroaches on access road, access road will need to be widened/re-routed and could be a concern due to the proximity of residential properties.
G	1	1	1	1	1	Depending on pole locations, existing access may be adequate. In franchise? Construction may not have adequate room for crane pad. If poles are on golf course property, access would be limited to outside of the fence.
H	2	1	2	1	1	Existing access roads in corridor. Road surface may not be adequate for construction equipment. Plating or some other type of mitigation will be necessary to protect the golf course surface. Permanent access will be through the golf course. First portion will be inside the golf course, but access would be from outside of the fence. Over-ex/scarify may be required for existing road prior to project completion.
I	1	1	1	1	1	If poles are in franchise, construction and O&M access is good. May require some grading/clearing for pad locations. Wildlife preserve?
J	3	1	3	1	1	Road surface may not be adequate for construction equipment within the golf course propoerty. Plating or some other type of mitigation will be necessary to protect the golf course surface. Permanent access will be through the golf course. New access roads needed with minimal grading depending on final pole locations. Ingress/egress locations will be needed for thru access. Possibly 5000' of new permanent access roads.
K	4	2	4	3	1	Road surface may not be adequate for construction equipment within the golf course propoerty. Plating or some other type of mitigation will be necessary to protect the golf course surface. Permanent access will be through the golf course. Possibly 4000' of new permanent access road in river area.
L	4	3	4	3	1	Extensive network of existing access roads. Depending on road condition, roads may need to be over-ex/scarified, widened, improvemed, etc. If pole is placed in river, construction and o&m access will be very difficult.
M	1	1	1	1	1	Previously disturbed ROW. Access road looks like it is in good condition. Depending on final pole placement, construction pads may be needed with minimal grading. If poles are in franchise, and accessible from main road, no new stub roads will be needed. If poles placed too far from main road, stub roads will be needed.
N	3	1	3	1	1	Park area will require permanent poles unless close enough to be access from main road. Possibly 5500' of new permanent access road. Terrain is not difficult. Some existing access roads in the vicinity and possible access from main road.
O	3	1	3	1	1	Terrain is not difficult. Poles through parking lot will not be tough on access, as long as permanent access is granted. Some new permanent roads will be needed on south eastern portion of line in railroad property?
P	3	1	1	1	1	Proposed route traverses parking lot, parks, and open area. Parks and open areas will require new permanent access roads. Surface will need to be over-ex/scarified.
Q	2	1	2	1	1	Mostly developed area (parking lot) but some previously disturbed ROW. Blading of existing roads will be required. Depending on pole location, southern area may require new ingress/egress.
0						

Route Scoring Worksheet - Civil Engineering

FACTORS

Access and Grading for Operation and Maintenance (CE)	
1	Existing roads/streets to the segment; sufficient turning space for large vehicles and loads.
2	Existing access to the segment. Minimal additional grading / construction would be required.
3	Some existing and some new roads required to access segment. Spur roads may be necessary. (Please indicate approximate percent of segment for which new road would be required).
4	Majority of segment will require new access roads and/or spur roads.
5	Lengthy, level, relatively straight road has to be built to get to the segment. Segment is not accessible.
F	Does not meet project objectives (Provide detailed explanation).

Overall Terrain (CE)	
1	Segment has completely flat terrain with good / safe construction and maintenance access.
2	Terrain is moderately sloped or curved (slopes greater than 3%, less than 5%). Good / safe construction and maintenance access.
3	Terrain is steep and/or rugged for a portion of the segment. Average access for construction and maintenance.
4	Majority of segment is very steep and/or rugged terrain (slope greater than 5%, less than 8%). Poor access for construction and maintenance.
5	Entire segment slope greater than 8.0%. Entire segment is hilly with minimal opportunities to work around the slopes
F	Does not meet project objectives (Provide detailed explanation).

Access and Grading for Construction (CE)	
1	Existing roads and ROWs acceptable. No access concerns at this time.
2	Existing roads and ROWs require some minor grading.
3	Existing roads and ROWs require minor grading and tree trimming. If possible, document approximate location and length of access roads needed.
4	Existing roads and ROWs require major grading, tree trimming and removal (permits required). If possible, document approximate location and length of access roads needed.
5	No existing access. Requires new roads. Major grading and tree trimming and removal. Potential fly-in location.
F	Does Not Meet Project Objectives (Provide detailed explanation)

Permits and Restrictions (CE)	
1	Low-impact permits anticipated along transmission route segment. Based on anticipated permit type(s), permits would not be anticipated to add significant time or cost to the project.
2	Medium-impact permits anticipated along transmission route segment anticipated to add minimal time or cost to the project.
3	Multiple medium and low impact permits anticipated along transmission route segment. Permitting process could add time and/or moderate costs to the project.
4	Multiple permits likely, including at least one of a more time consuming / costly nature (e.g. airport, flood control crossing, caltrans ROW, etc.) and/or large amount of unknown information about required permits.
5	Multiple permits required with a degree of complexity expected to add time and cost to the project.
F	Does Not Meet Project Objectives (Provide detailed explanation)

Surface and Subsurface Obstacles (Visual Observation Only) (CE)	
1	No apparent overhead or underground obstacles (pipes, trees, etc.)
2	A few known overhead or underground obstacles which can be avoided with little effort.
3	Multiple underground and/or overhead obstacles. Can be mitgated.
4	Multiple underground and/or overhead obstacles. Requires extensive effort to mitigate.
5	Extensively known underground or overhead obstacles which negate any possibility of mitigation in route segment.
F	Does Not Meet Project Objectives (Provide detailed explanation)

Route Scoring Worksheet - Community

Riverside Transmission Reliability Project

Segment	Potential Stakeholders	Community Development Guidelines	Controversy Along or Near the Route Segment	Planned Future Development Near the Route Segment	Comments
A	5	3	3	3	"Gateway to the city" is the phrase that the city officals use
B	5	3	3	3	"Gateway to the city" is the phrase that the city officals use. Part of this area was going to be a community park about five years back.
C	5	3	3	1	
D	5	3	3	1	
E	5	3	3	1	
F	5	3	3	1	Construction on Flood Control Channel is complete
G	5	3	3	1	
H	5	3	3	1	
I	5	3	3	1	Opposition dependent on how close to homes
J	5	3	3	1	
K	5	3	3	1	City may ask Why not go south on I-15 and east on this segment
L	5	3	3	1	
M	5	3	3	1	Underground gas and water lines prevented this from being an option when first considered in 2005 or '06, plus easement issues. Will be heavily opposed by residents and city council.
N	5	3	3	1	Close to high school
O	5	3	3	1	
P	5	3	3	1	Close to high school
Q	5	3	3	1	
0					

Route Scoring Worksheet - Community

FACTORS

Potential Route Segment-Specific Stakeholders (schools, churches, community centers, etc.)

1	There are no groups that would likely intervene with project siting.
2	Low likelihood of groups with an interest in the route segment or lands directly adjacent to intervene with project siting.
3	Potential for groups with an interest in the route segment or lands direclty adjacent to organize and intervene. Potential route segment ROW is not owned by groups with potential interest.
4	Route segment or lands directly adjacent are the subject of interest of an existing organized group and/or is owned by a stakeholder group (i.e. Land Trust, Conservation Agency, church, school district, etc.).
5	Existing, organized groups are very likely to actively intervene in the siting process if this route segment is carried forward. Groups have expressed intent to intervene and/or have intervened with prior proposed projects along the route segment.
F	Does not meet project objectives (Provide detailed explanation).

Community Development Guidelines

1	Area has no established guidelines for development design standards.
2	Some guidelines exist but have not been implemented (e.g. existing development pattern includes a mix of styles and/or is incohesive).
3	Some guidelines exist but do not specifically address utility or infrastructure development. Guidelines are not fully implemented in vicinity of the route segment.
4	Design guidelines exist and are fully implemented in the vicinity of the site, but do not specifically address utility or infrastructure development.
5	Local development guidelines and / or community plans specifically constrain or prohibit new infrastructure or infrastructure upgrades (e.g. segment is located in an underground district). Formal design guidelines are in place and evident in existing development.
F	Does not meet project objectives (Provide detailed explanation).

Current / Past Controversy Along or Near the Route Segment

1	No prior controversy along or near the route segment.
2	(Not applicable)
3	Any prior controversy at or near the route segment (regardless of project type involved in the controversy).
4	(Not Applicable)
5	Prior organized community opposition to related industrial development(s) at or near the route segment.
F	Does Not Meet Project Objectives (e.g. there is evidence of past or current controversy involving the route segment to such a degree that development of the segment with a subtrans line would be very unlikely).

Planned Future Development Near the Route Segment

1	No known development planned or in progress in the area. Easement or ROW for route segment is part of a developer's plan (e.g. would be included in the developer's EIR / EIS).
2	(Not applicable)
3	Route segment is located in an undeveloped area and / or redevelopment zone but there are no pending plans for the area.
4	(Not Applicable)
5	Planned future development potentially incompatible with subtransmission line.
F	Does Not Meet Project Objectives (e.g. City, County and / or current ROW owner has an approved plan for development of a school, church, community center, etc. on or along the route segment).

Route Scoring Worksheet - Cultural Resources

Riverside Transmission Reliability Project

Segment	Paleo Resources	Cultural Resources	Cultural Resources Permitting Time	Native American Resource Issues	Comments
A	1	2		3	
B	1	3		3	
C	1	1		3	
D	1	3		3	
E	1	4		4	
F	1	1		4	
G	1	1		4	
H	1	3		4	
I	1	4		4	
J	1	3		4	
K	1	3		4	
L	1	4		4	
M	1	1		3	
N	1	1		2	
O	1	1		2	
P	1	1		2	
Q	1	1		2	
0					

Route Scoring Worksheet - Cultural Resources

FACTORS

Paleontological Resources	
1	Low probability of encountering sensitive paleontological resources.
2	Moderate probability of encountering sensitive paleontological resources.
3	High probability of encountering sensitive paleontological resources.
4	(Not Applicable)
5	(Not Applicable)
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: If conditions are present that are not captured by the criteria for a score of "1", "2", or "3", please score a "4" or "5" as appropriate and document the rationale for the higher score in the comments field.

Cultural Resources	
1	Low probability of encountering significant archaeological / historical resources.
2	Moderately low probability of encountering significant archaeological / historical resources.
3	Moderate probability of encountering significant archaeological / historical resources.
4	Moderately high probability of encountering significant archaeological / historical resources.
5	High probability of encountering significant archaeological / historical resources.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Cite which regulatory approvals may be required. In your comments, please provide additional information regarding your assumptions or additional data that will be needed.

Cultural Resources Permitting Time	
1	Routine public land survey permits (e.g., BLM, USFS, ACOE) and unlikely resource issues.
2	Routine public land survey permits (e.g., BLM, USFS, ACOE) and minimal/insignificant resource issues.
3	Resource issues requiring NRHP/CRHR assessment, possible SHPO consultation, PA and HPMP.
4	Probable NRHP/CRHR eligible properties requiring SHPO consultation and development of PA and HPMP.
5	NRHP/CRHR eligible properties of critical agency concern. Succussful development of acceptable PA and HPMP questionable.
F	Does not meet project objectives (Provide detailed explanation).

Examples: SCORE 1: 6 months to 1 year, any federal resource issues addressed by existing no-effect PA; SCORE 2: 6 months to 1 year, any federal resource issues addressed by existing no-effect PA; SCORE 3: 1 to 2 years depending on results of NRHP/CRHR assessment, extent of SHPO consultation, project effects, and scope of PA and HPMP; SCORE 4: 2 years plus depending on number of NRHP/CRHR elegible properties, difficulty of SHPO, public or Native American consultation, project effects, and difficulty reaching agreement on acceptable PA and HPMP. SCORE 5: 2 years to never. Expect agency insistence on coplete avoidance, project re-route, or project denial. Extensive and difficult SHPO, public or Native American consultation. Low probability of reaching agreement on acceptanble PA and HPMP.

Native American Resource Issues	
1	No known or potential for Native American or other ethnic issues.
2	Low potential for Native American or other ethnic issues, inactive or dispursed NA or other ethnic community.
3	Some potential for Native American or other ethnic issues due to presence of active NA or ethnic community in project area.
4	Possible resources perceived important to the Native American community, and active Native American or other ethnic community in project area.
5	Likely resources perceived important to the Native American Community, Native American reservation lands, and active and likely vehemently opposed Native American or other ethnic community in project area.
F	Does not meet project objectives (Provide detailed explanation).

Route Scoring Worksheet - EMF

Riverside Transmission Reliability Project

Segment	Setbacks from Prioritized Land Uses	Comments
A	4	4- Residential
B	4	4- Residential
C	4	4- Residential
D	4	4- Residential
E	3	3- Commercial / Industrial
F	4	4- Residential
G	3	3- Commercial / Industrial / Agric. Homes
H	2	2- Recreational
I	4	4- Residential
J	5	5- Van Der Molen Elementary School (setback is 150 feet)
K	2	2- Agricultural / Recreational & Parks
L	2	2- Agricultural / Recreational & Parks
M	5	5- Mira Loma Middle School (setback-150 feet)
N	4	4- Residential
O	3	3- Industrial
P	5	5- Jurupa Valley High School (setback 150 feet)
Q	3	3- Industrial
0		

Route Scoring Worksheet - EMF

FACTORS

Setbacks from Prioritized Land Uses	
1	Near undeveloped or US Forest Service land
2	Near recreational (parks) or agricultural land
3	Route segment is located near commercial, industrial or agricultural residence land uses
4	Near more densely populated residential areas
5	Near schools, licensed daycare facilities, or hospitals
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Scoring criteria based on the CPUC's EMF prioritized land uses.

Route Scoring Worksheet - Geology-Geotech

Riverside Transmission Reliability Project

Segment	Adverse Soil Conditions	Erosion Potential	Flooding Potential	Slope Stability/Landslide	Liquefaction Potential	Fault Rupture Hazard Zones	Soil Contamination	Comment
A	2	1	1	1	1	1	2	
B	2	1	1	1	1	1	2	
C	2	1	1	1	1	1	2	
D	2	1	1	1	1	1	2	
E	2	2	5	1	5	1	2	
F	2	5	5	1	1	1	2	Erosion potential along flood control channel which leads to slope instability.
G	2	1	1	1	1	1	2	
H	2	1	1	1	5	1	2	
I	2	2	5	1	5	1	2	
J	2	1	1	1	5	1	2	
K	2	5	5	1	5	1	2	Adjacent to/near high erosion areas of Santa Ana River
L	2	5	5	5	5	1	2	Crosses large span on Santa Ana River-Potential Erosion, Scour, & Slope Instability
M	2	1	1	1	1	1	2	
N	2	1	1	1	1	1	2	
O	2	1	1	1	1	1	2	
P	2	1	1	1	1	1	2	
Q	2	1	1	1	1	1	2	
0								

Route Scoring Worksheet - Geology-Geotech

FACTORS

Adverse Soil Conditions Along Segment	
1	No known adverse soil conditions along segment.
2	Low likelihood for adverse soil conditions along segment.
3	(Not Applicable)
4	(Not Applicable)
5	Documented adverse soil conditions along segment.
F	Does not meet project objectives (Provide detailed explanation).

Erosion Potential	
1	No problem
2	Low likelihood of erosion potential
3	(Not Applicable)
4	(Not Applicable)
5	High
F	Does not meet project objectives (Provide detailed explanation).

Flooding Potential	
1	No visible watercourse or natural drainage on or near the segment.
2	(Not Applicable)
3	(Not Applicable)
4	(Not Applicable)
5	Serious documented flood hazards associated with the segment.
F	Does not meet project objectives (Provide detailed explanation).

Slope Stability/Landslide Hazards	
1	No documented landslides at or surrounding the segment.
2	(Not Applicable)
3	(Not Applicable)
4	(Not Applicable)
5	Major, documented landslide at or directly above the segment.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Based on the extent or percentage of a parcel underlain by mapped landslides

Liquefaction Potential	
1	Very low or no liquefaction potential.
2	(Not Applicable)
3	(Not Applicable)
4	(Not Applicable)
5	Very high liquefaction potential.
F	Does not meet project objectives (Provide detailed explanation).

Fault Rupture Hazard Zones	
1	No active or potentially active documented faults crossing adjacent to or beneath the segment.
2	(Not Applicable)
3	(Not Applicable)
4	(Not Applicable)
5	Presence of documented active fault (or A-P Fault Rupture Hazard Zone) crossing adjacent to or beneath the segment.
F	Does not meet project objectives (Provide detailed explanation).

Soil Contamination	
1	No or very low likelihood of soil contamination.
2	Low likelihood of soil contamination.
3	Moderate likelihood of soil contamination.
4	(Not Applicable)
5	High likelihood of soil contamination.
F	Does not meet project objectives (Provide detailed explanation).

Route Scoring Worksheet - Transmission Engineering

Riverside Transmission Reliability Project

Segment	Slope of Segment	Pole/ Tower Design	Permits and Restrictions	Availablty of ROW for O&M	Terrain along Segment	Access for O&M	Comment
A	1	4	1	4	1	1	
B	1	4	1	5	1	1	Parking lot spots will be impacted through parking lot on Etiwanda and Limonite
C	1	4	5	5	1	1	Residential properties will need to be condemned.
D	1	4	1	5	1	1	
E	1	4	1	5	1	1	
F	1	4	4	5	1	1	
G	1	4	1	5	4	1	
H	1	4	1	5	1	3	Special roads may need to be planned in order for maintenance to be able to access sites without damaging golf course terrain.
I	1	4	1	3	1	3	
J	1	4	4	4	1	2	For the portiono f this segment that traverses the golf course special roads may need to be planned in order for maintenance to be able to access sites without damaging golf course terrain.
K	1	4	3	5	1	5	Segment impacts several environementally sensistive areas. New access road would need to be graded throughout south side of route prallaeling the Santa Ana River. For the portiono f this segment that traverses the golf course special roads may need to be planned in order for maintenance to be able to access sites without damaging golf course terrain.
L	1	4	1	2	2	3	
M	1	4	5	5	1	1	There is an existing gas pipeline running along Bain St which would need to be relocated.
N	1	4	1	5	1	1	
O	1	4	1	5	1	4	
P	1	4	1	5	1	1	May require condenming a few residentail properties.
Q	1	4	1	5	1	4	
0							

Route Scoring Worksheet - Transmission Engineering

FACTORS

Slope of Segment (TE)	
1	Segment has completely flat terrain with good / safe construction and maintenance access.
2	Terrain is moderately sloped or curved (slopes greater than 3%, less than 5%). Good / safe construction and maintenance access.
3	Terrain is steep and/or rugged for a portion of the segment. Average access for construction and maintenance.
4	Majority of segment is very steep and/or rugged terrain (slope greater than 5%, less than 8%). Poor access for construction and maintenance.
5	Entire segment slope greater than 8.0%. Entire segment is hilly with minimal opportunities to work around the slopes.
F	Does not meet project objectives (Provide detailed explanation).

Pole/Tower Design (TE)	
1	Standard SCE overhead construction throughout.
2	Standard SCE overhead construction with minimal custom or specialized engineering necessary.
3	Mixed standard and non-standard design towers.
4	Multiple engineered TSP or tower using non-standard structures with complicated design factors.
5	Unique structures require high level of engineering. Non-standard design
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Scoring of this factor will be based on preliminary field determinations only and will not be based on precise engineering.

Permits and Restrictions (TE)	
1	Low-impact permits anticipated along transmission route segment. Based on anticipated permit type(s), permits would not be anticipated to add significant time or cost to the project.
2	Medium-impact permits anticipated along transmission route segment anticipated to add minimal time or cost to the project.
3	Multiple medium and low impact permits anticipated along transmission route segment. Permitting process could add time and/or moderate costs to the project.
4	Multiple permits likely, including at least one of a more time consuming / costly nature (e.g. airport, flood control crossing, caltrans ROW, etc.) and/or large amount of unknown information about required permits.
5	Multiple permits required with a degree of complexity expected to add time and cost to the project.
F	Does not meet project objectives (Provide detailed explanation).

Availability of ROW for O&M (TE)	
1	Likely no new ROW required.
2	Possible existing ROW of sufficient width. Likely able to use existing ROW pending Rights Check information.
3	Existing distribution route along segment. Upgraded rights likely required.
4	ROW width slightly deficient. Special and / or more numerous structures required.
5	All new ROW required. Extremely steep and/or rugged terrain. Poor access for maintenance.
F	Does not meet project objectives (Provide detailed explanation).

Terrain along Segment (TE)	
1	Terrain flat with good maintenance access.
2	Terrain moderately sloped/curved. Good maintenance access.
3	Very steep and/or rugged terrain. Average access for maintenance.
4	Special and/or more numerous structures required. Very steep and/or rugged terrain. Poor access for maintenance.
5	Special and/or more numerous structures required. Extremely steep and/or rugged terrain. Poor access for maintenance.
F	Does not meet project objectives (Provide detailed explanation).

Access to the Segment for Operations & Maintenance (TE)	
1	Existing roads/streets to the segment; sufficient turning space for large vehicles and loads.
2	Existing access to the segment. Minimal additional grading / construction would be required.
3	Some existing and some new roads required to access segment. Spur roads may be necessary. (Please indicate approximate percent of segment for which new road would be required).
4	Majority of segment will require new access roads and/or spur roads.
5	Lengthy, level, relatively straight road has to be built to get to the segment. Segment is not accessible.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Please indicate approximate distance of new roads required, where applicable.

Route Scoring Worksheet - Transmission Project Delivery

Riverside Transmission Reliability Project

Segment	Slope Access Roads	Remove / Replace Existing	Pole/ Tower Design for Transm	Permits and Restrictions	Surface and Subsurface Obstacles	Scheduling Outages	Access for Constn	Access Roads Needed	Avail. of ROW	Comments
A	1	4	3	2	2	3	2	2	3	No existing subtransmission on street. Existing overhead distribution lines. Not sure about underground utilities. Assuming upgraded rights.
B	1	4	3	2	1	3	2	2	3	No existing subtransmission on street. Existing overhead distribution lines. Not sure about underground utilities. Assuming upgraded rights.
C	1	4	3	2	1	3	2	2	3	No existing subtransmission on street. Existing overhead distribution lines. Not sure about underground utilities. Assuming upgraded rights.
D	1	2	3	2	2	2	2	1	4	Distribution for only on small portion of segment. Not sure about underground utilities. Assuming mostly new ROW.
E	1	2	3	2	2	2	2	1	4	Distribution for only on small portion of segment. Not sure about underground utilities. Assuming mostly new ROW.
F	1	3	3	4	1	1	2	2	5	No existing subtransmission. Not sure about underground utilities. Assuming new ROW needed.
G	1	3	3	2	3	3	2	3	3	Existing distribution. Assuming upgraded rights.
H	3	5	5	4	3	5	2	2	5	Removal of existing 66 kV. Not sure about underground utilities. Assuming wider ROW and upgraded rights. Nothing definitive about proposed structure type being feasible for this Project. New routes would need to be identified for existing 66 or distribution lines.
I	1	1	3	2	3	1	3	3	5	Tree trimming and vegetation removal. New ROW
J	1	4	3	4	5	5	2	2	5	Issues with existing lines and new homes.
K	3	1	3	5	4	1	4	5	5	Major vegetation removal and trimming. New access needed for construction and O&M. Anticipate long construction delays due to nesting and permitting. New ROW needed.
L	3	5	5	4	3	5	2	2	5	Removal of existing 66 kV. Not sure about underground utilities. Assuming wider ROW and upgraded rights. Nothing definitive about proposed structure type being feasible for this Project.New routes would need to be identified for existing 66 or distribution lines. Would be ideal if the new line was parallel to existing; if this is the case then the design score would change from a 5 to a 3.
M	1	1	3	3	4	1	2	1	5	Seems that there are existing underground utilities. Assuming new ROW.
N	1	1	3	2	2	1	2	1	5	Not sure about underground utilities. Assuming mostly new ROW.
O										
P	1	4	3	2	3	5	2	1	3	Existing 66 kV
Q	1	1	3	2	2	1	2	1	5	No existing subtransmission on street. Not sure about underground utilities. Assuming new ROW.
0										

FACTORS

Slope of Segment for Access Roads (TPD)	
1	Segment has completely flat terrain with good / safe construction and maintenance access.
2	Terrain is moderately sloped or curved (slopes greater than 3%, less than 5%). Good / safe construction and maintenance access.
3	Terrain is steep and/or rugged for a portion of the segment. Average access for construction and maintenance.
4	Majority of segment is very steep and/or rugged terrain (slope greater than 5%, less than 8%). Poor access for construction and maintenance.
5	Entire segment slope greater than 8.0%. Entire segment is hilly with minimal opportunities to work around the slopes.
F	Does not meet project objectives (Provide detailed explanation).

Remove / Replace Existing Structures (TPD)	
1	Existing transmission structures along segment and/or substructure with vacancy available. Minimal replacements or upgrade only anticipated.
2	Possible modifications to existing transmission structures to accommodate new circuit or line.
3	New structures required. No existing distribution or subtransmission facilities present.
4	New structures required; would require some relocation of existing transmission.
5	New structures required; requires significant effort to accommodate subtransmission or transmission.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: To the extent known, please indicate what additional information will be required (e.g. wind loading, etc.) to determine whether existing facilities can be used or will need to be replaced.

Constructability-Pole/Tower Design for Transmission (TPD)	
1	Standard SCE overhead construction throughout.
2	Standard SCE overhead construction with switches, taps or underbuild.
3	Engineered TSPs, high speed or 3-way switches. riser poles or underbuild.
4	Multiple engineered TSP w/ taps, risers, switches and/or underbuild.
5	Unique structures require high level of engineering. Non-standard design (i.e. all tubular steel pole line and / or lattice towers).
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Scoring of this factor will be based on preliminary field determinations only and will not be based on precise engineering.

Constructability - Permits and Restrictions (TPD)	
1	Low-impact permits anticipated along transmission route segment. Based on anticipated permit type(s), permits would not be anticipated to add significant time or cost to the project.
2	Medium-impact permits anticipated along transmission route segment anticipated to add minimal time or cost to the project.
3	Multiple medium and low impact permits anticipated along transmission route segment. Permitting process could add time and/or moderate costs to the project.
4	Multiple permits likely, including at least one of a more time consuming / costly nature (e.g. airport, flood control crossing, caltrans ROW, etc.) and/or large amount of unknown information about required permits.
5	Multiple permits required with a degree of complexity expected to add time and cost to the project.
F	Does not meet project objectives (Provide detailed explanation).

Surface and Subsurface Obstacles (Visual Observation Only) (TPD)	
1	No apparent overhead or underground obstacles (pipes, trees, etc.)
2	A few known overhead or underground obstacles which can be avoided with little effort.
3	Multiple underground and/or overhead obstacles. Can be mitgated.
4	Multiple underground and/or overhead obstacles. Requires extensive effort to mitigate.
5	Extensively known underground or overhead obstacles which negate any possibility of mitigation in route segment.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: If visual observation indicates potential obstacles are present, please note additional research that should be undertaken by the team to further investigate.

Difficulty Scheduling Outages on Existing Lines to Proceed with Construction (TPD)	
1	No outages required.
2	Outages required. (Switchable).
3	Multiple outages Trans and Distribution required. (Switchable).
4	Outage restriction. Requires PM and Weekend work.
5	Major Outage Required. Customer Outage. May require temporary line construction.
F	Does not meet project objectives (Provide detailed explanation).

Access to the Segment for Construction (TPD)	
1	Existing roads/streets to the segment; sufficient turning space for large vehicles and loads.
2	Existing access to the segment. Minimal additional grading / construction would be required.
3	Some existing and some new roads required to access segment. Spur roads may be necessary. (Please indicate approximate percent of segment for which new road would be required).
4	Majority of segment will require new access roads and/or spur roads.
5	Lengthy, level, relatively straight road has to be built to get to the segment. Segment is not accessible.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Please indicate approximate distance of new roads required, where applicable.

Access Roads Needed for Construction (TPD)	
1	Existing roads and ROWs acceptable. No access concerns at this time.
2	Existing roads and ROWs require some minor grading.
3	Existing roads and ROWs require minor grading and tree trimming. If possible, document approximate location and length of access roads needed.
4	Existing roads and ROWs require major grading, tree trimming and removal (permits required). If possible, document approximate location and length of access roads needed.
5	No existing access. Requires new roads. Major grading and tree trimming and removal. Potential fly-in location.
F	Does not meet project objectives (Provide detailed explanation).

Availability of ROW for Construction (TPD)	
1	Likely no new ROW required.
2	Possible existing ROW of sufficient width. Likely able to use existing ROW pending Rights Check information.
3	Existing distribution route along segment. Upgraded rights likely required.
4	ROW width slightly deficient. Special and / or more numerous structures required.
5	All new ROW required. Extremely steep and/or rugged terrain. Poor access for construction.
F	Does not meet project objectives (Provide detailed explanation).

Route Scoring Worksheet - Subtransmission

Riverside Transmission Reliability Project

Segment	Difficulty Scheduling Outages on Existing Lines	Remove / Replace / Relocate Existing Subtransmission	Comments
A	1	F	There are currently no existing facilities on the south side of this Segment. The likelyhood of aquiring new right-of-way is low because there is no benefit to this jurisdiction. Additionally there is not enough roon on the s/s of Limonite to accomodate new double circuit 220kV. Conductor blowback will make overhang and issue. Phase to phase separation on 220kV construction is about 30'. Easements for this new construction will be required....not acceptable to locate these new facilities in existing franchise. The only area of this segment that seems compatable is between Winevill and the Flood Control Channel.
B	1	F	A good portion of this segment is compatible (from the FC to the existing market). At that point major reconfiguration of their facilities will be requried with the likeleyhood of conductor blowback. It appears that from face of curp to the face if their building is abot 50'. At the intersection of Etiwanda and Limonite there is an exsiting structure. It will be impossible to construct at this location without overhanging the building. On the north side from face of curb to face of building is about 30'. On the east side it is only about 15'. Condemnation and demolition of the building would be required. Easement acquisition problematic and franchise construction not an option.
C	1	F	Major impact to commercial and residential structures and property to accommodate new 220kV construction. Proximity to remaining residential will be an issue.
D	5	5	Land use seems potentially compatible in this segment. Existing rights will be required to widen the existing easement to accommodate 220kV construction and sub trans will require relocation, which will be problematic in this area. Environnmental concerns. This is a wetlands area that makes undergrounding the subtrans and distribution problematic.
E	1	1	Area on the south side of Limonite in this segment looks generally compatable. Some reconfiguation at Troth will be required to accommodate subtrans. New easement requirements may be problematic in the environmentally sensitive area. Continuing access for T/L maintenance may be problematic thru environmentally snesitive area.
F	1	1	Area appears to be potentially compatable for construction and future maintenance. R/W acquisition will be problematic and there will be some impact to resiential property. Additional engineering considerations will possibly required to look at payloads from our footings on the channel walls.
G	5	5	Following an alignment on the e/s of Lucerita is potentially feasible. Conflicts with existing subtrans and distribution will be encountered at 68th street. Significant relocation efforts will be requried to accommodate.
H	5	5	Significant construction issues. Additional R/W will be required to accommodate 220kV contruction. Use of 3 circuit structure currently not an option for Trans at this point. We would look at 66kV underground before that. Cost prohibitive at approx. $4M+ per mile just for Transmission. Additional separation constraints will be introduced between Dist and Trans UG installations.
I	5	5	Significant construction issues. New easements required on golf course property with significant impact to their landscape buffer (rows of Eucalyptus trees) on 66th St. Construction from 66kV Northeast towards Limonite is all in wetlands area. Subtrans relcation will be requred for at least a portion of this route. Existing subtrans TSP crossing the river must be maintained. Envirnmentally sensitive area. Access for ongoing maintenance will be an issue.
J	F	F	Significant space issues, major imacts to new residential construction. Significant impacts to existing 66kV line. This segment is not compatible. Additional R/W acquisition is very unlikely.
K	1	1	Environmental issues. Access issues for ongoing maintenance.
L	1	1	R/W Acquisition, Environmental and spacial concerns.
M	1	1	R/W Acquisition and spacial concerns.
N	1	4	Clearance from residential to accommodate 220kV construction. School clearance at Etiwanda. R/W acquisition.
O	1	1	Continuing access to RR property will be problematic. Acquisition of easements will be problematic. Structure imacts at Mission and Bellegrave.
P	5	F	Space constraints on North sideof Cantu-Galleneao for 220kV and major relocation/ug of existing 66kV.
Q	4	4	Relocation probable at Cantu Galleaneao for sub trans. New R/W acquisition will be problematic adjacent to Etiwanda.
0			

Route Scoring Worksheet - Subtransmission

FACTORS

Difficulty Scheduling Outages on Existing Lines to Proceed with Construction (ST)	
1	No outages required.
2	Outages required. (Switchable.)
3	Multiple outages Subtransmission required. (Switchable.)
4	Outage restriction. Requires PM and Weekend work.
5	Major Outage Required. Customer Outage. May require temporary line construction.
F	Does not meet project objectives (Provide detailed explanation).

Remove / Replace / Relocate Existing Subtransmission Structures (ST)	
1	No subtransmission crossings along the segment. No subtransmission work likely.
2	Possible modifications to existing structures to accommodate subtransmission facilities needed for project or to accommodate crossing of existing subtransmission facilities.
3	Some relocation or replacement of existing structures required to accommodate crossing of existing subtransmission facilities.
4	Some new structures required; would require some relocation or replacement of existing structures.
5	New structures required; requires significant effort to accommodate subtransmission needs.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: To the extent known, please indicate what additional information will be required to determine whether significant effort would be required to accommodate a crossing of existing subtransmission facilities.

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Route Scoring Worksheet - Land Use

Riverside Transmission Reliability Project

Segment	Zoning / General Plan Land Use(s)	Existing Land Use(s)	Special Districts, Specific Plans, Redevelpmnt	Airport Land Use Plan	Comment
A	4	4	4	1	Zoning: CPS, RI, C1-CP, RA Land Use: Commercial Retail [CR] to Medium Density Residential to GP overlay of LR over [CR] and LDR-RC (Limonite Policy Area)
B	4	4	4	1	Zoning: RA, C1-CP, CPS Land Use: GP overlay of LR over LDR-RC to [CR] (Limonite Policy Area)
C	4	4	1	1	Zoning: A1 to C1-CP Land Use: CR to LDR-RC
D	5	5	1	1	Zoning: W1 Land Use: Conservation Habitat [CH]
E	5	5	1	2	Zoning:W1 Land Use: [CH] (under 20000' from Riverside Airport runway)
F	5	4	4	1	Zoning: W1 Land Use: GP overlay of LR over LDR-RC
G	5	4	4	1	Zoning: W1 Land Use: LDR-RC (Santa Ana River Corridor)
H	5	5	4	1	Zoning : W1 Land Use: LDR-RC to Water (Santa Ana River Corridor)
I	4	4	4	1	Zoning: A1 to W1 Land Use: LDR-RC to [CH] (Santa Ana River Corridor)
J	4	5	1	1	Zoning: A-2-10 to W1 to R-5 Land Use: Low Density Residential to LDR-RC to Water
K	5	5	4	1	Zoning: W1 to Outside Land Use: Low Density Residential to Open Space Recreation to Water (Santa Ana River Corridor)
L	5	5	4	1	Zoning: W1 to A1-5 to Outside Land Use: Water mixed with [CH] (Santa Ana River Corridor)
M	5	5	3	2	Zoning: W1 to C1-CP to RA20000 to A1-4 to W1 to A1 to W1 to TRAIL! To M-SC Land Use: [CH] to LDR-RC (Recreation /Equestrian Trail) (under 20000' from Riverside Airport runway)
N	3	3	1	1	Zoning: R1 to A-2-10 to R1 to C1-CP to A-1-10 to C-P-S Land Use: Business Park to Med Density Residential (GP overlay of BP) to Commerical Retail to LDR-RC to Open Space Rec
O	3	2	1	1	Zoning: MH-5 to M-SC Land use: Light Industrial to Business Park
P	3	5	2	1	Zoning: A-1-10 to C-P-S to I-P to M-SC Land use: Public Facilities to Open Space Recreation to Business Park
Q	3	1	1	1	Zoning: M-H-5 Land Use: light industrial
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Route Scoring Worksheet - Land Use

FACTORS

Zoning / General Plan Land Use(s) Surrounding the Segment	
1	Industrial
2	Business Park / Office, Agriculture
3	Commercial
4	Residential, Mixed Use
5	Public Facilities (school, hospital, library, etc.), Park, Open Space, Recreation, Airport, Utilities
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Please provide the zoning designation(s).

Existing Land Use(s) Surrounding the Segment	
1	Vacant, Industrial
2	Business Park / Office, Agriculture
3	Commercial
4	Residential, Mixed Use
5	Public Facilities (school, hospital, library, etc.), Park, Open Space, Recreation, Airport, Utilities
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Please provide the actual land use(s) surrounding the site. If known, note whether the proposed segment is adjacent to / in an existing SCE Right-of-Way.

Special Districts, Specific Plans, Redevelopment Project Area	
1	Route segment is not located in a special district, specific plan or redevelopment project area.
2	Potential for Specific Plan (e.g. General Plan has called it out but Plan is not developed and/or approved yet). Site is in the sphere of influence of a city and / or is in a County Area Plan.
3	Route segment is located in a Specific Plan, designated Scenic Highway corridor, or in an area with design / development guidelines (e.g. lighting, walls, landscaping).
4	Route segment is in a Special District, has an Overlay Zone or is part of a Redevelopment Project Area.
5	Multiple plans / overlay zones are applicable to the site.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: Provide the Name and Date of any applicable plans.

Airport Land Use Plan	
1	Route is not located in an Airport Land Use Plan Area.
2	Route is 20,000 feet from the nearest point of the nearest runway. May interfere with ancillary airport uses.
3	Route is located in Zone E (Other Airport Environs) of an Airport Land Use Plan. Airspace Review will be required for structures over 100 feet tall.
4	Route is located in Zone C (Extend Approach / Departure Zone) or D (Primary Traffic Patterns and Runway Buffer Area) of an Airport Land Use Plan. Airspace Review required for structures over 70 feet tall.
5	Route is located in Zone B1 (Inner Approach / Departure Zone) or B2 (Adjacent to Runway) of an Airport Land Use Plan. Airspace review required for structures over 35 feet tall.
F	Does Not Meet Project Objectives (e.g. Route segment is located in a Runway Protection Zone and / or an Airport Land Use Zone that specifically prohibits electrical facilities).

Scoring SME: If Route is scored a "2", use FAA Tool Application to determine height restrictions within this area. If Route is near an airport that is not covered by an Airport Land Use Plan, please note approximate distances from and orientation of the route segment relative to the runway. If known, note potential risks associated with building the segment (if scoring a "4" or "5").

Route Scoring Worksheet - Land Acquisition

Riverside Transmission Reliability Project

Segment	Easement/Rights Required	Comments
A	3	New acquisitions required. Potential issues with development on North side.
B	3	New acquisitions required. Empty lots for potential development, small section on commercial property requiring acquisition and/or possible condemnation.
C	5	New acquisitions required. Segment includes 4 commercial lots (including Stater Brothers) and 7 residential parcels. Condemnation possibly required.
D	2	New acquisition required - vacant/private property
E	2	New acquisition required - vacant/private property
F	3	Riverside County flood control channel. Easement acquisition dependent on County's requirements and/or restrictions.
G	3	New acquisition required.
H	3	Amendments to existing acquisition documents required. 220 kV r/w width needed from engineering.
I	4	(3 Rating) New acquisitions required for golf course property, (5 rating) potential condemnation of 3 homes as the route angles North.
J	5	60+ new acquisitions required. Assuming area is already entitled/zoned for development, this would raise project costs significantly.
K	2	May have existing rights for portion of segment K, would need to amend to accommodate 220 kV r/w requirements.
L	3	State River, existing SCE transmission corridor, would need to upgrade rights.
M	5	(Bain) Flood control and gas line.
N	5	Too close to school
O	3	Union Pacific property. New acquisition required and/or condemnation.
P	5	Too close to school
Q	3	Union Pacific property. New acquisition required and/or condemnation.
0		

Route Scoring Worksheet - Land Acquisition

FACTORS

Easement/Rights Required	
1	No new rights required; franchise; or, existing corridor with sufficient rights for proposed segment.
2	Lands underlying segment owned by a private property owner, partnership or trust; or, would require an upgrade of existing rights on government-owned lands.
3	Lands underlying segment owned by City, County, State, Agency, Business, Corporation, or International Owner.
4	Lands underlying segment have federal ownership and SCE has no existing rights; or require the removal & relocation of a single family residence (based on field observation).
5	Lands underlying segment are owned by Tribal entity / Native American lands, or require removal & relocation of a business / commercial building.
F	Does not meet project objectives (Provide detailed explanation).

Scoring SME: If encroachments are visible along the route, please indicate the approximate location (APNs if available), and the approximate percentage % of the segment affected by the encroachments.

Route Scoring Worksheet - Government Lands

Riverside Transmission Reliability Project

Segment	Property Rights	Comments
A	1	
B	1	
C	1	
D	1	
E	1	
F	1	
G	1	
H	1	
I	1	
J	1	
K	1	
L	1	
M	1	
N	1	
O	1	
P	1	
Q	1	
0		

Route Scoring Worksheet - Government Lands

FACTORS

Property Rights	
1	Land is available for property rights / easements to be obtained.
2	(Not applicable)
3	(Not applicable)
4	(Not applicable)
5	Agency(ies) have future plans for the lands underlying the segment that would make easement unattainable.
F	Does not meet project objectives (Provide detailed explanation).