Third Amendment to the Proponent's Environmental Assessment for Southern California Edison Company's Alberhill System Project

Volume 1

June 2023 (Amended PEA submittal date)

Construction of Alberhill Substation, construction of two new 500 kilovolt (kV) transmission line segments to connect the new substation to Southern California Edison Company's (SCE's) existing Serrano-Valley 500 kV transmission line, construction of a new 115 kV subtransmission line and modifications to four existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations to the new Alberhill 500/115 kV Substation, installation of telecommunications improvements to connect the new facilities to SCE's telecommunications network.

The Alberhill System Project would be located in the unincorporated Riverside County and the cities of Lake Elsinore, Wildomar, and Menifee.

Application A.09-09-022 to the California Public Utilities Commission

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EXECUTIVE SUMMARY

This ~~second~~third amendment to the Proponent's Environmental Assessment (PEA) (Third Amended PEA or ~~Second~~Third Amendment to the PEA)[1] evaluates the potential environmental impacts of Southern California Edison's (SCE's) Alberhill System Project (Proposed Project or ASP).~~[1]~~[2] In Decision (D.) 18-08-026 for the ASP proceeding issued August 31, 2018, the California Public Utilities Commission (CPUC) took no action on the ASP and directed SCE to supplement the existing record with additional analyses. These additional analyses ~~include~~included a Planning Study~~[2]~~[3] and other documentation that supports the project need, ~~describes~~described the applicable planning criteria and reliability standards, and ~~provides~~provided a technical and economic analysis of additional alternatives SCE considered in order to enhance system reliability and provide additional system capacity. ~~The purpose of this Second Amendment to PEA is to include those additional alternatives developed in the Planning Study in the PEA analysis. Based on this analysis, the ASP continues to be the Proposed Project.~~

The purpose of this Third Amendment to the PEA is to identify the technical design modifications and additional engineering refinements that have occurred since the time of the Original ASP (i.e., the project design documented in the Final Environmental Impact Report [FEIR] published in 2017 or Original Project) and to evaluate the potential changes in environmental impacts associated with those modifications and refinements. As reflected in revisions to Chapter 3, Project Description and summarized in a new Appendix N, the principal design modification involves converting the 500 kV switchrack at the proposed Alberhill Substation from a gas-insulated switchgear (GIS) design to an air-insulated switchgear (AIS) design to reduce greenhouse gas emissions and costs. Other refinements are primarily to recognize the completion of the Valley-Ivyglen Project and other recent small-scale subtransmission system changes in the Proposed Project area and to leverage this existing infrastructure to simplify and reduce the impacts of the Proposed Project. Work areas and staging yards have also been slightly modified to accommodate these changes and other local development activities that have occurred over recent years. Finally, this amendment documents SCE's intent to use helicopter construction methods previously acknowledged in the FEIR which will eliminate the need to construct certain access roads, thereby reducing temporary and permanent impacts associated with constructing those roads.

Hereinafter, references to the "Proposed Project" include this revised scope. Accordingly, Chapter 3, Project Description; Chapter 4, Environmental Impact Assessment; and Chapter 5, Comparison of Alternatives have been updated to include the design modification and additional engineering refinements referenced above. To describe these changes in more detail, the Project Description from the FEIR has been modified to account for the Proposed Project. This revised Project Description has been included as Appendix M: Revised Project Description. In addition,

[1] Revisions to the Second Amendment to the PEA have been identified by marking new text with green underline and deleted text with ~~red strikeout~~.

~~[1]~~[2] After the site selection for the Alberhill Substation concluded, SCE commenced the routing analysis for 500 kV transmission line segment options to access the existing Serrano-Valley 500 kV transmission line to source the new substation. During this process, seven alternative routes were developed. Two additional segments were added in March 2011.

~~[2]~~[3] See Item C- "Planning Study" as attached to SCE's Motion to Supplement the Record dated May 11, 2020.

Appendix N: Project Design Comparison summarizes the changes between and provides a map comparing the Original ASP and Proposed Project. The results of the environmental analysis associated with the Proposed Project design have been included as Appendix O: Revised Environmental Impact Analysis. Based on the analysis contained in Appendix O: Revised Environmental Impact Analysis, the Proposed Project continues to be the preferred alternative.

The purpose of the Proposed Project is to serve current and projected demand for electricity, and maintain electric system reliability in portions of southwestern Riverside County, including the cities of Lake Elsinore, Canyon Lake, Perris, Menifee, Murrieta, Murrieta Hot Springs, Temecula, and Wildomar, as well as the surrounding unincorporated portions of Riverside County (Electrical Needs Area).

In addition to serving the forecasted demand for the Electrical Needs Area, the Proposed Project would relieve the Valley South 115 kilovolt (kV) System by transferring electrical demand from this system to the new Alberhill system. The Proposed Project would also improve electrical reliability and operational flexibility in southwestern Riverside County. The Proposed Project would include the following major components:

- Construction of a new 1,120 megavolt ampere (MVA) 500/115 kV substation to increase electrical service capacity to the area presently served by the Valley South 115 kV System
- Construction of two new 500 kV transmission line segments to connect the new substation to SCE's existing Serrano-Valley 500 kV transmission line
- Construction of a new 115 kV subtransmission line (approximately three miles in length) and modifications to four existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations (Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations) presently served by the Valley South 115 kV System to the new Alberhill 500/115 kV Substation
- Installation of telecommunications improvements to connect the new facilities to SCE's telecommunications network

This PEA includes the information required by the CPUC PEA Guidelines (State of California Public Utilities Commission Information and Criteria List, Appendix B, Section V), as well as the CPUC's requirements for a Certificate of Public Convenience and Necessity (CPCN) pursuant to General Order 131-D (D.94-06-014, Appendix A, as modified by D.95-08-038). The CPUC requires applicants to provide this information for review in compliance with the mandates of the California Environmental Quality Act (CEQA). This PEA is designed to meet the above-mentioned CPUC requirements.

Following a discussion of the purpose and need for the project (Chapter 1), the alternatives (Chapter 2), and the project description (Chapter 3), this PEA evaluates the potential environmental impacts of the Proposed Project and the alternatives (Chapter 4). Potential impacts are assessed for all environmental factors contained in the most recent CEQA

Environmental Checklist Form[~~3~~4] (Appendix A). With the implementation of Applicant Proposed Measures the PEA concluded that the ~~Proposed Project~~Original ASP (with the GIS design) would have a significant effect to air quality.

The ~~Final Environmental Impact Report (~~FEIR~~)~~, dated April 2017, concluded there were Significant impacts to Aesthetics, Air Quality, and Noise and Vibration.[~~4~~5] The FEIR also concluded there were Less than Significant impacts to Agriculture and Forestry Resources; Biological Resources; Cultural Resources; Geology, Soils, and Minerals; Greenhouse Gases; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Population and Housing; Public Services and Utilities; Recreation; and Transportation. The FEIR supersedes the SCE PEA and based on the FEIR findings, SCE will comply with the APMs and Mitigation Measures included in the FEIR. ~~Table E.1, Comparison of PEA and FEIR Impacts summarizes the differences between the impact assessments in the PEA and FEIR.~~

The analysis contained in Appendix O: Revised Environmental Impact Analysis concludes that the Proposed Project would change the level of significance of Impact AQ-4 (ASP) from significant with mitigation to less than significant due to reductions in criteria air pollutant emissions during construction. In addition, while Impact GHG-1 (ASP) would remain less than significant, replacing the GIS substation design with an AIS substation design would reduce annual operating greenhouse gas emissions by approximately 75 percent. Lastly, the changes to the Proposed Project added approximately 11 acres of temporary construction areas that were not covered by prior cultural resource surveys. SCE is currently organizing pedestrian cultural resource surveys of these locations and will provide the associated technical report(s) to the CPUC as soon as they are available. As a result, the potential impacts associated with these additional temporary construction areas cannot be determined. Table E.1, Comparison of PEA and FEIR Impacts and Table 5.1 Comparison of Alternatives have been modified to include a summary of the impact levels associated with the Original ASP as documented in the PEA, the Original ASP as documented in the FEIR, and the Proposed Project as documented in Appendix O: Revised Environmental Impact Analysis.

A comparison of alternatives is described in Chapter 5. No cumulative impacts or growth-inducing impacts (Chapter 6) were identified for the proposed project.

The names and titles of persons assisting in the preparation of this document are listed in Appendix B.

[~~3~~4] In order to stay consistent with the existing Alberhill System Project PEA, SCE's environmental analysis was based on the 2009 version of the CEQA Environmental Checklist Form.

[~~4~~5] The FEIR also determined there would be significant cumulative impacts to Aesthetics, Air Quality, and Biological Resources. It also determined there would be a potential for significant cumulative impacts to Cultural Resources if multiple projects were to impact the same known resource.

Table ES.1 Comparison of PEA and FEIR Impacts

Section	~~Proposed Project~~Original ASP (PEA)	Original ASP (FEIR)	Proposed Project (Appendix O)
Aesthetics	Less than significant	Significant and unavoidable	Significant and unavoidable
Agricultural Resources	Less than significant	Less than significant	Less than significant
Air Quality	Significant	Significant with mitigation	Significant with mitigation
Biological Resources	Less than significant	Less than significant with mitigation	Less than significant with mitigation
Cultural Resources	Less than significant	Less than significant with mitigation	Less than significant with mitigation/No determination*
Geology and Soils	Less than significant	Less than significant	Less than significant
Hazards and Hazardous Materials	Less than significant	Less than significant with mitigation	Less than significant with mitigation
Hydrology and Water Quality	Less than significant	Less than significant with mitigation	Less than significant with mitigation
Land Use and Planning	No Impact	Less than significant with mitigation	Less than significant with mitigation
Mineral Resources	Less than significant	Less than significant	Less than significant
Noise	Less than significant	Significant and unavoidable	Significant and unavoidable
Population and Housing	No Impact	Less than significant	Less than significant
Public Services	Less than significant	Less than significant with mitigation	Less than significant with mitigation
Recreation	No Impact	Less than significant	Less than significant
Transportation and Traffic	Less than significant	Less than significant with mitigation	Less than significant with mitigation
Utilities and Service Systems	Less than significant	Less than significant	Less than significant

* The potential impacts for approximately 11 acres of temporary construction areas that were added to the Proposed Project but not covered by a prior cultural resource study have not been determined. SCE will provide one or more technical reports describing the result of pending pedestrian surveys within these areas when available.

1.0 PURPOSE AND NEED

Southern California Edison's (SCE's) Valley South System currently serves over 187,000 metered customers, representing approximately 560,000 individuals, nearly 6,000 of which are critical care customers. As discussed further below, 2018 adjusted peak demand, which includes weather adjustments to reflect a 1-in-5 year heat storm, is currently at 99.9 percent of the Valley South System's ultimate system design capacity (1,120 megavolt amperes [MVA]). Forecasted load growth shows that peak demand is expected to exceed the rated transformer capacity of the system by the year 2022.

The Valley South System has a unique combination of characteristics as compared to SCE's other subtransmission systems that result in capacity, reliability, and resiliency challenges and contribute to the likelihood of occurrence and/or impact of events that lead to loss of service to customers.[1]

Valley Substation (sourcing both the Valley North and Valley South Systems) is constructed to its maximum design capacity and customer demand continues to increase. Reducing the amount of load served by the Valley South System in particular is critical, because loading in this system has reached the maximum loading limits of its two load-serving transformers. When customer demand exceeds available capacity, load is subject to curtailment and customers could lose electrical service. Reducing load served in the area served by the Valley South System is necessary to ensure continuity of electrical service to customers during normal system conditions and during contingency events commonly planned for by SCE and throughout the electric utility industry in North America.

The reliability issues in the Valley South System are associated with a combination of characteristics related to its limited capacity margin, configuration, and size. In its current configuration, The Valley South System is the only SCE subtransmission system that does not have any system tie-lines to other systems. This results in an isolated system with negative impacts to reliability and resiliency due to the inability to transfer load during typically planned-for system contingency events and unplanned outages, including high-impact, low-probability events. The lack of capacity and absence of system tie-lines requires a solution to maintain the integrity of the electric system, and to prevent and mitigate customer service outages.

Improving resilience in the Electrical Needs Area served by Valley Substation is equally important. The extraordinary number of customers currently served from Valley Substation means that a reasonably foreseeable extreme event such as an earthquake, cyber incident, or physical attack could leave up to one million customers at risk of prolonged loss of electrical service, as all of the power provided to the region is delivered from the transmission system through Valley Substation. The lack of a geographically diverse (from Valley Substation) second source of power to the region, coupled with the absence of system tie-lines, requires a solution consistent with common industry practices to increase resiliency and maintain the integrity of the electric system.

[1] See Item B - "Identification of all subtransmission planning areas in the SCE system with similar reliability issues" as attached to SCE's Compliance filing dated May 8, 2020

SCE proposes to construct the Alberhill System Project (Proposed Project or ASP) to serve current and projected demand for electricity, ~~and~~ maintain electric system reliability, and increase resilience in portions of southwestern Riverside County including the cities of Lake Elsinore, Canyon Lake, Perris, Menifee, Murrieta, Murrieta Hot Springs, Temecula, and Wildomar, as well as the surrounding unincorporated portions of Riverside County (Electrical Needs Area).

In addition to serving the forecasted demand for the Electrical Needs Area, the Proposed Project would relieve the Valley South 115 kilovolt (kV) System by transferring electrical demand from this system to the new Alberhill System. The Proposed Project would also improve electrical reliability and operational flexibility in southwestern Riverside County.

The ASP addresses the capacity, reliability, and resiliency concerns in a number of ways. First, a new 500/115 kV substation (the Alberhill Substation) would be constructed that provides the required capacity for the region from the transmission system through substation transformers. The Alberhill Substation would provide a second source of power to the region that would be located approximately 20 miles from the existing Valley Substation. This would both geographically and electrically diversify the sources of power provided to the region from the transmission system. Diversification reduces the likelihood that both sources of power would be impacted by a common event, thereby improving both reliability and resilience. Additionally, the Proposed Project would create 115 kV subtransmission system tie-lines between the existing Valley South System and the new Alberhill System. Providing system tie-lines between electrical systems allows for the transfer of substations between systems for activities such as maintenance but more critically, for response to emergency conditions. The ability to reconfigure the electrical systems via system tie-lines and load transfers is termed "operational flexibility" and increases reliability and resilience.

The Proposed Project would include the following major components:

- Construction of a new 1,120 MVA 500/115 kV substation to increase electrical service capacity to the area presently served by the Valley South 115 kV System
- Construction of two new 500 kV transmission line segments to connect the new substation to SCE's existing Serrano-Valley 500 kV transmission line
- Construction of a new 115 kV subtransmission line (approximately three miles in length) and modifications to four existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations (Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations) presently served by the Valley South 115 kV System to the new Alberhill 500/115 kV Substation
- Installation of telecommunications improvements to connect the new facilities to SCE's telecommunications network

1.1 PROJECT PURPOSE

The purpose of the Proposed Project is to remedy deficiencies present in the existing Valley South System, which include insufficient transformer capacity, lack of system tie-lines to an adjacent electrical system, and vulnerabilities associated with serving a significant number of customers from one point of connection to the broader transmission grid (i.e., single point of failure).

Under the rules, guidelines and regulations of the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Council (NERC), Western Electricity Coordinating Council~~,~~ (WECC), and California Public Utilities Commission (CPUC), electrical transmission, subtransmission, and distribution systems must have sufficient capacity to maintain safe, reliable, and adequate service to customers. Consistent with NERC, FERC, and WECC, as well as with Good Utility Practice,[2] SCE's planning criteria and guidelines require SCE to provide sufficient capacity while maintaining the delivery of electrical power in a safe and reliable manner. The safety and reliability of the systems must be maintained under normal conditions when all facilities are in service, as well as under abnormal conditions during equipment or line failures, maintenance outages, or outages that cannot be predicted or controlled, which are caused by weather, earthquakes, traffic accidents or any other unforeseeable events.

SCE's subtransmission systems are unique, both among the large California electric utilities and in the electric utility industry in general, because they are designed as radially served networks served from a single point of connection with the California Independent System Operator- (CAISO-) controlled transmission grid. A radially served subtransmission system is not designed or operated in the same manner as a networked subtransmission system. In a networked design, the subtransmission and transmission systems operate electrically in parallel (i.e., they have multiple points of connection at both the transmission system level and the subtransmission level). In a networked system, power flow is continually and automatically rebalanced in response to changes in customer load or in response to equipment outages. The automatic response of a network system occurs because of the multiple paths power can flow through to reach the customer load. In contrast, a radially served subtransmission system design does not have multiple points of connection with the transmission grid. Instead, during contingency events it relies on system operator intervention and capacity from adjacent radially served subtransmission systems to provide reliability and resilience. These adjacent systems are able to assist through a combination of transformer capacity and the presence of system tie-lines that are effective in allowing system operators to transfer load between systems to address reliability and/or resilience events when they occur.

The lack of an adjacent system and system tie-lines in the Valley South System adversely impacts the operation of the system and reduces reliability and resilience. SCE's Subtransmission Planning Criteria and Guidelines, as well as prudent system planning practices

[2] In 107 FERC 61, 052 FERC Policy Statement on Matters Related to Bulk Power System Reliability FERC clarifies that it interprets "Good Utility Practice" to include compliance with NERC reliability standards or more stringent regional reliability council standards. While the Valley South subtransmission system is not under FERC jurisdiction, SCE's subtransmission planning standards are consistent with the NERC TPL–001-5 minimum requirements that there is no consequential load loss under both P0 (also known as N-0 or no contingency) and P1 (also known as N-1 or single contingency) conditions.

for designing radially served electrical systems, require adequate system facilities to ensure that during both normal system conditions as well as single contingency (N-1) emergency events that all customer demand remains served and equipment ratings are not exceeded. Because the Valley South System has neither adequate transformer capacity nor any transfer capacity (due to lack of system tie-lines) there is a significant risk of customer load being unserved under commonly planned for N-1 contingency conditions, for which all customer load is expected to be served.

1.2 PROJECT NEED

SCE's Valley Substation, located in Romoland, California, is the sole source serving customer electrical demand in the San Jacinto Region of southwestern Riverside County, an area encompassing roughly 1,260 square miles and serving approximately 350,000 metered customers. Valley Substation transforms voltage from 500 kV to 115 kV with four 560 MVA transformers. In 2004, the Valley 115 kV System was split into two separate and distinct 115 kV systems, the Valley North 115 kV System and the Valley South 115 kV System. Each of these systems is served by two 560 MVA transformers. These two 115 kV systems are served from the same 500 kV sources~~,~~; however, they are not connected at the 115 kV level. The Valley North 115 kV System consists of 11 distribution substations and the Valley South 115 kV System is served by 14 distribution substations.

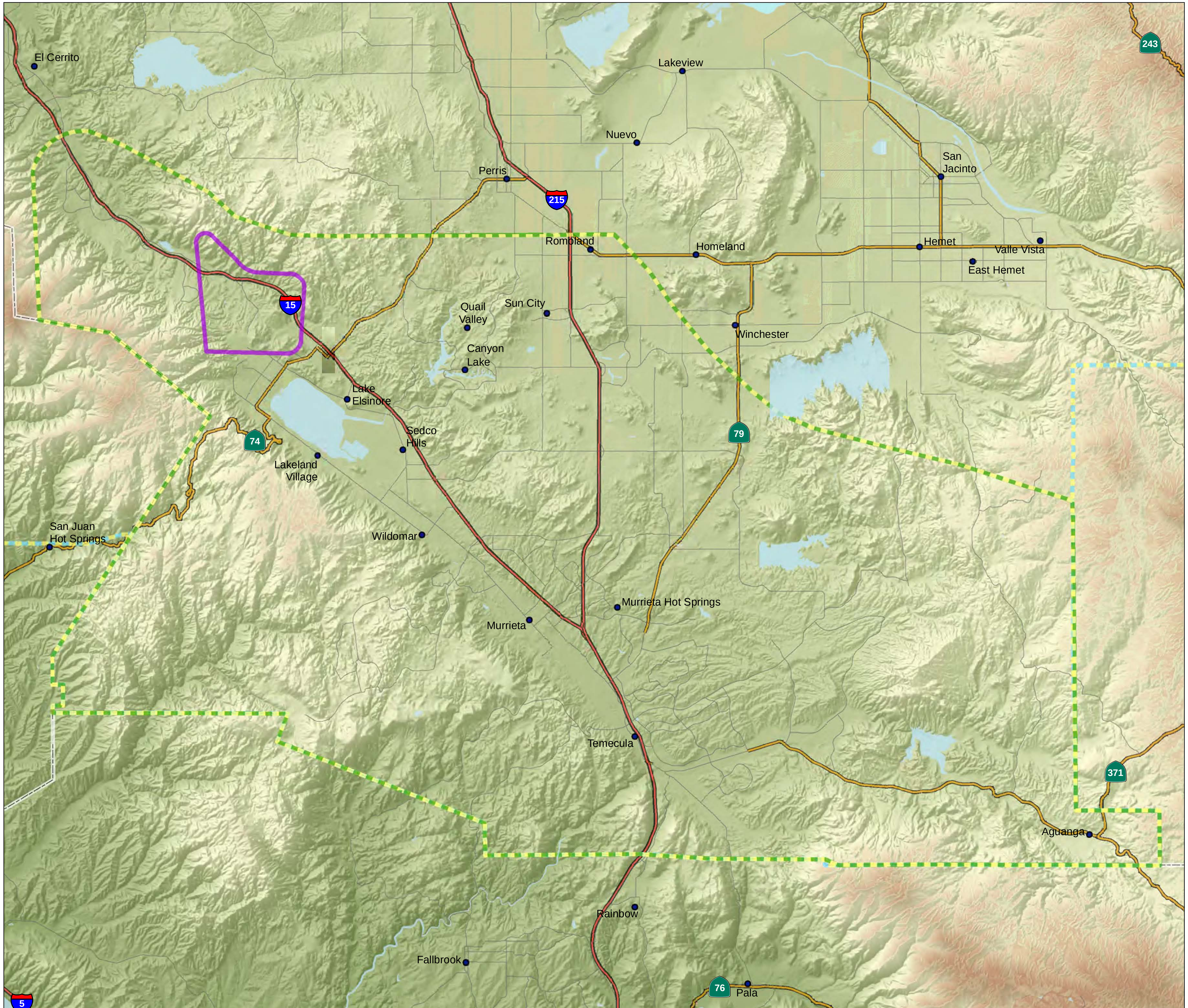
Operating limits (the amount of electrical load that can be served by equipment) have been established to ensure that SCE maintains the required capacity and system operational flexibility to safely and reliably meet the projected peak electrical demands during periods of extreme heat, under both normal and abnormal conditions. The amount of electrical load that can be served by the Valley South 115 kV System is limited to the maximum amount of electrical power that the two Valley South 115 kV System transformers can serve before exceeding operating limits.

The Electrical Needs Area for the Proposed Project is bounded by the Cleveland National Forest on the west, San Diego Gas & Electric Company's service territory to the south, the San Bernardino National Forest to the east. The northern boundary of the Electrical Needs Area is generally formed by an approximate line beginning at Lake Mathews and extending eastward through Hemet along State Route 74 to the San Bernardino National Forest. This portion of southwestern Riverside County includes the cities of Lake Elsinore, Canyon Lake, Perris, Menifee, Murrieta, Murrieta Hot Springs, Temecula, and Wildomar, and is shown on Figure 1.1, Electrical Needs Area.

1.2.1 Substation Capacity and Electrical Demand

For substations connected directly to a 500 kV transmission system, a 10-year forecast is developed annually that identifies the projected peak electrical demands under normal conditions as well as the projected peak electrical demands for 1-in-5 year heat storms (time periods during which the effective temperature exceeds the 10-year average peak effective temperature by four degrees Fahrenheit).

Figure 1.1
Electrical Needs Area

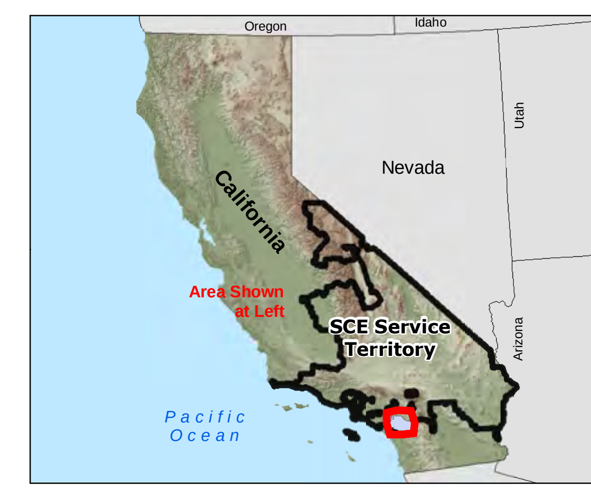


Electrical Needs Area

- Electric Needs Area
- Substation Target Area
- SCE Service Territory Boundary (SCE, 2006)
- County Boundaries (TBM, 2008)

N W E S

0 2 4 8 Miles



Features depicted herein are planning level accuracy, and intended for informational purposes only. Distances and locations may be distorted at this scale. Always consult with the proper legal documents or agencies regarding such features.

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Peak electrical demand forecasts are typically based on residential, commercial and industrial developments that are planned or under construction, as well as historical growth trends of the area. The Electrical Needs Area has continued to experience growth in electrical demand and has demonstrated an average annualized growth rate of approximately 2.1 percent from 2009 to 2018; approximately 1 percent in recent years.

Historical adjusted values are developed by adjusting actual recorded values to account for temperature and other factors to produce representative load values used for planning purposes. SCE first normalizes the historical data to a common temperature base. In order to determine the forecast for system-level studies, SCE also adjusts the historical data using a temperature representative of a 1-in-5 year heat storm. This is consistent with the CAISO practice of using 1-in-5 year weather adjusted load for subtransmission system studies.~~[2]~~[3] The historical adjusted peak electrical demand for the years 2009 to 2018 and the forecasted peak electrical demand for the years 2019 to 2028 are shown in Table 1.1, Valley South 115 kV System Capacity and Peak Demand, and on Figure 1.2, Valley South 115 kV System Capacity and Peak Demand. As shown in Table 1.1, Valley South 115 kV System Capacity and Peak Demand, and on Figure 1.2, Valley South 115 kV System Capacity and Peak Demand, SCE forecasts that the 1-in-5 year heat storm projected peak electrical demand will increase to 1,125 MVA by 2022, exceeding the available transformer capacity of the Valley South 115 kV System. SCE's forecasted peak electrical demand indicates that there is a need to reduce loading on the transformers that provide service to the Valley South 115 kV System.

Though SCE triggers a new capacity project (such as the ASP) when peak demand is projected to exceed the total normal-condition rating of the transformers (in this case 1,120 MVA), SCE notes that when loading levels exceed the short-term emergency loading limit (896 MVA) of a single 560 MVA transformer should there be an unplanned outage of the second transformer, there is load at risk of losing electrical service and the potential of equipment damage if loading is permitted to exceed 896 MVA. Generally, this can be addressed with an automatic load-shedding scheme and then with load restoration through the use of system tie-lines. However, in the case of the Valley South System, this is not possible as it does not have any system tie-lines.

~~As a result of SCE installing a fifth 500/115 kV transformer at Valley Substation to comply with SCE's Transmission Planning Criteria and Guidelines as well as having applied for a Certificate of Public Convenience and Necessity (CPCN) to construct a proper long-term solution (ASP) and could not implement a load-shedding scheme, SCE elected to develop a mitigation plan. This mitigation plan was expected to address the few years during which it was projected that a relatively small number of instances (with short durations) would occur where load would be less than the 1,120 MVA but greater than 896 MVA. If electrical demand was projected to exceed the short-term emergency rating of a single transformer (896 MVA) of the Valley South 115 kV System, the spare transformer would be temporarily put into service as a contingency measure to ensure overloads would not occur.~~

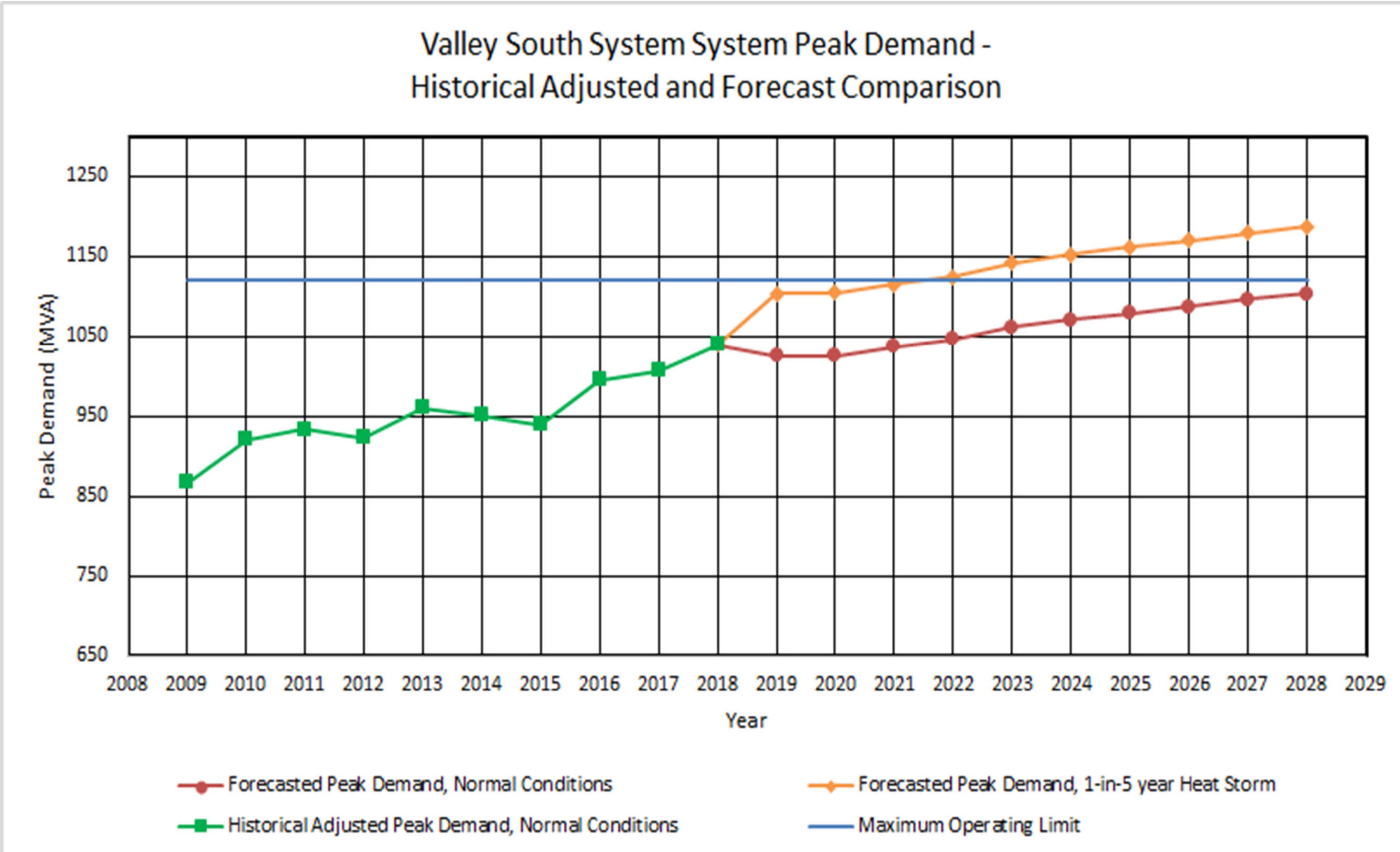
~~[2]~~[3] See Item A - "Load Forecast" as attached to SCE's Compliance filing dated May 8, 2020.

Table 1.1 Valley South 115 kV System Capacity and Peak Demand

Historical Adjusted	2009	2010	2011	2012	2013
Maximum Operating Limit (MVA)	1,119	1,119	1,119	1,119	1,119
Adjusted Peak Demand, Normal Conditions (MVA)	867	921	934	923	960
Historical Adjusted	**2014**	**2015**	**2016**	**2017**	**2018**
Maximum Operating Limit (MVA)	1,119	1,119	1,119	1,119	1,119
Adjusted Peak Demand, Normal Conditions (MVA)	951	940	995	1,006	1,039
Forecasted	**2019**	**2020**	**2021**	**2022**	**2023**
Planned Maximum Operating Limit (MVA)	1,119	1,119	1,119	1,119	1,119
Forecasted Peak Demand Normal Conditions (MVA)	1,025	1,026	1,037	1,046	1,061
Forecasted Peak Demand 1-in-5 Year Heat Storm (MVA)	1,103	1,104	1,116	1,125	1,142
Forecasted	**2024**	**2025**	**2026**	**2027**	**2028**
Planned Maximum Operating Limit (MVA)	1,119	1,119	1,119	1,119	1,119
Forecasted Peak Demand Normal Conditions (MVA)	1,071	1,079	1,087	1,096	1,104
Forecasted Peak Demand 1-in-5 Year Heat Storm (MVA)	1,153	1,161	1,170	1,179	1,187

Note: 2019 data is expected to be available by June 2020

Figure 1.2 Valley South 115 kV System Capacity and Peak Demand



Due to the unprecedented customer load growth in the early 2000s, the on-site emergency spare transformer was redesignated as a load-serving transformer in 2004 to address inadequate supply and maintain electrical service to customers. However, because SCE's Subtransmission Planning Criteria and Guidelines require that each 500/115 kV substation have an on-site spare transformer, SCE then had to procure and install a fifth 500/115 kV transformer at Valley Substation as an on-site emergency spare transformer. As the proposed operating date for the Proposed Project was expected to occur after the date the transformer capacity of the Valley South System was expected to be exceeded, SCE developed a temporary overload mitigation measure that would utilize the emergency spare transformer at Valley Substation to provide additional capacity to serve base load during peak conditions and prevent load shedding. This temporary mitigation plan was developed and predicated on the expected approval and construction of a long-term solution (i.e., the ASP) being completed in the near term. Without the temporary mitigation plan and during peak load conditions, customer load would be shed to ensure transformer loading limits were not exceeded if an unplanned transformer outage occurred. This is a direct result of the lack of system tie-lines that would otherwise be used to address transformer overload conditions during an unplanned transformer outage. This mitigation plan was expected to address the few years during which it was projected that a relatively small number of instances (with short durations) would occur where electrical demand was projected to exceed the short-term emergency rating of a single transformer (896 MVA) of the Valley South 115 kV System. In those instances, the spare transformer would be temporarily put into service as a contingency measure to ensure overloads would not occur. This short-term mitigation plan was and still is not intended to be a long-term solution.[~~3~~4]

1.2.2 Operational Flexibility

The ability for system operators to reconfigure an electrical system, rebalance load, accommodate planned outages (necessary for maintenance or construction), and to respond in real-time to unplanned outages (contingency events) is termed operational flexibility, and is a critically important design tenet to ensure reliability and to improve resilience, especially for radially designed electrical systems.

As a result of geographic boundaries and SCE service territory boundaries, as well as the lack of an adjacent electrical system with a compatible voltage to connect to, the Valley South 115 kV System has no system tie-lines to any other system at the 115 kV level. As such, SCE's ability to transfer load between systems is nonexistent. The inability to transfer load from the Valley South 115 kV System to another system limits the operational flexibility of the system which increases the potential for electrical service interruptions to prevent potential transformer or subtransmission line overloads. Having no system tie-lines also limits the ability to operate the system during construction of new facilities and routine maintenance activities.

Another key element of operational flexibility is having adequate capacity within the radially served electrical systems. This applies to the capacity of the substation transformers and the capacity of the tie-lines between systems. Sufficient capacity (both transformers and tie-lines)

[~~3~~4] See Item H "Identify capital investments or operational changes effectuated to address reliability issues in the absence of construction of Alberhill Substation and associated costs for such actions" as attached to SCE's Compliance filing dated May 8, 2020.

provides system operators with the ability to reconfigure the system by transferring load from one system to another. Systems without sufficient capacity limit the ability of operators to respond to planned and unplanned equipment outages within the system.

1.3 BASIC OBJECTIVES

The California Environmental Quality Act (CEQA) and CEQA Guidelines (Section 15126.6(a)) require consideration of a reasonable range of alternatives to a proposed project, or the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project. SCE has identified the following basic objectives[~~4~~5] to meet the Proposed Project's purpose and need as described in this chapter:

- Serve current and long-term projected electrical demand requirements in the Electrical Needs Area
- Increase system operational flexibility and maintain system reliability by creating system ties that establish the ability to transfer substations from the current Valley South 115 kV System
- Transfer a sufficient amount of electrical demand from the Valley South 115 kV System to maintain a positive reserve capacity on the Valley South 115 kV System through the 10-year planning horizon
- Provide safe and reliable electrical service consistent with SCE's Transmission Planning Criteria and Guidelines
- Increase electrical system reliability by constructing a project in a location suitable to serve the Electrical Needs Area
- Meet project need while minimizing environmental impacts
- Meet project need in a cost-effective manner

~~SCE considered these basic objectives in developing a reasonable range of alternatives.~~

In April 2017, the CPUC issued a Final Environmental Impact Report (FEIR) for the ASP. Using the objectives developed by SCE in its Proponent's Environmental Assessment (PEA) (PEA

[~~4~~5] In this ~~Second~~Third Amendment to the PEA, SCE retained the ~~Project Objectives~~project objectives from the original PEA (PEA Project Objectives) (dated September 30, 2009) instead of the modified ~~Project Objectives~~project objectives in the Final Environmental Impact Report (FEIR Project Objectives). This is because the FEIR Project Objectives would have constrained alternatives to those that include a 500 kV substation and such a constraint would be counter to the purpose of the supplemental analysis that SCE was directed to perform in Decision (D.) 18-08-026 for the ASP proceeding.

Project Objectives), the CPUC identified the following three objectives for the ASP (FEIR Project Objectives):

- Relieve projected electrical demand that would exceed the operating limit of the two-load serving Valley South 115 kV System 500/115 kV transformers;
- Construct a new 500/115 kV substation within the Electrical Needs Area that provides safe and reliable electrical service pursuant to North American Electric Reliability Corporation and Western Electricity Coordinating Council standards; and
- Maintain system ties between a new 115 kV System and the Valley South 115 kV System that enable either of these systems to provide electricity in place of the other during maintenance, during emergency events, or to relieve other operational issues on one of the systems.

The FEIR Project Objectives reflect the electrical system needs of the Valley South System as identified by SCE as described below.

Relieve projected electrical demand on the existing Valley South System transformers.

Loading of the Valley South System transformers would be reduced by decreasing the electrical demand they are required to provide. Currently, Valley Substation has five 500/115 kV transformers installed. Two load-serving transformers that provide power to the Valley North System, two load-serving transformers that provide power to the Valley South System, and one transformer that is an emergency spare shared between the two systems as needed when there is a planned or unplanned outage of one of the four load-serving transformers. The shared emergency spare transformer was installed in 2012 and has been needed on approximately 30 separate occasions to serve load as overload mitigation. The spare transformer has also been used on over 300 other days to serve its intended purpose (i.e., as a spare transformer replacing an out-of-service transformer) as needed for planned outages (e.g., maintenance or construction activities) or for unplanned outages of any of the other four transformers. SCE's planning criteria require each 500/115 kV substation to have an on-site emergency spare transformer; however, if the spare transformer is being used to serve load under normal conditions, the substation is left without an immediately available spare transformer. Additionally, when the spare transformer is in use for its intended purpose as a spare transformer, it is then not available as overload mitigation. Accordingly, this FEIR Project Objective appropriately requires a solution that would relieve the projected electrical demand that would exceed the operating limits of the two existing Valley South load-serving transformers.

Construct a new 500/115 kV substation within the Electrical Needs Area that provides safe and reliable electrical service.

The second FEIR Project Objective addresses the need to provide an additional source of power to the Electrical Needs Area while also geographically diversifying the locations of power from the transmission system to the region in order to improve reliability and resilience. The lack of a second source of power that is geographically diverse from Valley Substation requires a solution consistent with common industry practices of diversifying the physical location of critical electrical facilities to increase reliability and resiliency while maintaining the integrity of the electric system. Improvements to reliability and resiliency would result from the construction of a second source of power to the area sited in a suitable location that decreases the likelihood that a singular cause (e.g., fire, flood, earthquake, physical attack, etc.) could remove all sources of power to the region.

Maintain system ties between a new 115 kV System and the Valley South 115 kV System.

The third FEIR Project Objective addresses the need to be able to transfer load to and from an adjacent and compatible electrical system for the purpose of improving operational flexibility during normal system conditions as well as for response to emergency conditions. This directly improves the reliability of the system as well as providing resilience. Improvements would result from the creation of system tie-lines following the construction of a second source of power to the area and after the transfer of substations from the Valley South System to the new source of power. These system tie-lines would allow for bi-directional transfer of load from one system to the other to address system needs.

1.4 ELECTRICAL SYSTEM EVALUATION

SCE utilizes a multi-step planning process to ensure that necessary system facilities are developed in time to meet projected electrical demand. This planning process begins with the development of a peak electrical demand forecast for each substation. Peak electrical demand forecasts are developed using historical data and trends in population data, urbanization data, and meteorological data.

1.4.1 Electrical System Evaluation Methodology

Electrical systems have defined operating limits. Technical engineering studies are conducted to determine whether the forecasted peak electrical demand can be accommodated on the existing transmission, subtransmission, and distribution systems. When projections indicate that these limits will be exceeded within a specific planning horizon (typically 10 years), a project is proposed to keep the electrical system within specified operating limits.

During this process, SCE evaluates existing facilities within the Electrical Needs Area. SCE first evaluates whether the existing electrical infrastructure could be modified to meet the project need. If not, SCE evaluates what new infrastructure would be required and where it would be located in order to meet the project need. Evaluating SCE's system ability to address identified needs consists of the four-step process described below.

Step 1. Technical engineering analyses are performed to determine whether the forecasted peak electrical demand could be accommodated by modifying the existing electrical infrastructure.

Step 2. If the forecasted electrical demand cannot be accommodated by modifying the existing electrical infrastructure, then a series of system scenarios are developed.

Step 3. Each system scenario is evaluated in accordance with the following criteria:

- The extent to which the system scenario would substantially meet the project need; and
- The feasibility of the system scenario, including system capacity limits, ability to upgrade the system on existing utility sites, and economic considerations

Step 4. If a system scenario is determined not to be feasible, it is eliminated from further consideration.

1.4.2 Evaluation of System Scenarios

The original PEA dated September 30, 2009, evaluated a total of four system scenarios: the ASP (System Scenario 1); installation of an additional transformer serving the Valley South System (System Scenario 2); transfer of electrical demand from the Valley South System to the Valley North System (System Scenario 3); and a no project alternative (System Scenario 4).

In Decision (D.) 18-08-026 for the ASP proceeding, the California Public Utilities Commission (CPUC) took no action on the ASP and directed SCE to supplement the existing record with additional analyses. These additional analyses include a Planning Study[~~5~~6] that supports the project need, describes the applicable planning criteria and reliability standards, and provides a cost/benefit analysis of additional alternatives for enhancing reliability and providing additional capacity. This ~~Second~~Third Amendment to PEA retains all of the original system scenarios, and now includes additional system scenarios developed in the Planning Study and associated Cost/Benefit analysis.[~~6~~7] For System Scenario 3, the transfer of electrical demand from Valley South to Valley North, the PEA discussion has been modified from that in the original PEA to reflect the additional analysis that was performed in the Planning Study.

Section 1.4.2.3 through Section 1.4.2.9 below describe these new system alternatives and provide a summary conclusion on each new alternative's viability of meeting the ~~ASP~~PEA Project Objectives and each alternative's performance, cost effectiveness, and implementation risk as determined in the Planning Study.

1.4.2.1 System Scenario 1: Alberhill System Project

This section evaluates System Scenario 1, the construction of the new Alberhill 500/115 kV Substation with an initial capacity of 1,120 MVA and the formation of the Alberhill System. The substation would be located within the Electrical Needs Area, west of the existing Valley Substation and in proximity to an existing 500 kV line right-of-way (ROW). Construction of two 500 kV transmission line segments, approximately one mile in length each, would be required to loop the existing Serrano-Valley 500 kV transmission line into the new substation. Major project components are listed below.

- Construction of the new 1,120 MVA Alberhill 500/115 kV Substation

[~~5~~6] See Item C - "Planning Study" as attached to SCE's Compliance filing dated May 8, 2020
[~~6~~7] See Item G - "Cost-Benefit" Analysis as attached to SCE's Compliance filing dated May 8, 2020

- Construction of two new 500 kV transmission line segments to connect the Alberhill Substation to SCE's existing Serrano-Valley 500 kV transmission line
- Construction of a new 115 kV subtransmission line and modifications to existing 115 kV subtransmission lines to facilitate the transfer of five existing 115/12 kV substations which are presently served by the Valley South 115 kV System to the new Alberhill 115 kV System
- Installation of necessary of telecommunication improvements

System Scenario 1 would provide the following electrical benefits:

- Addition of 1,120 MVA of transformer capacity to the Electrical Needs Area resulting from the construction of the Alberhill 500/115 kV Substation
- Reduction in transformer loading with the transfer of approximately 380 MVA from the Valley South 115 kV System to the Alberhill 115 kV System through the initial transfer of five existing 115/12 kV substations
- Increased system operational flexibility due to the formation of the Alberhill System and the creation of 115 kV system ties between the Valley South 115 kV System and the Alberhill 115 kV System
- Potential for the future transfer of additional 115 kV substations to the Alberhill 115 kV System when the equipment within the Valley South 115 kV System approaches operating limits

1.4.2.2 System Scenario 2: Install an Additional Transformer at Valley South 115 kV System

This section evaluates the feasibility of installing an additional 560 MVA 500/115 kV transformer to increase the load serving capacity of the Valley South 115 kV System. The addition of a new transformer at Valley Substation would increase the total number of 500/115 kV transformers from five to six. If an additional transformer were installed, SCE would operate five load-serving transformers, two serving the Valley North System and three serving the Valley South System. The sixth transformer would serve as a system spare transformer as required to comply with SCE's Transmission Planning Criteria and Guidelines. This alternative is not technically feasible because there is insufficient space at Valley Substation to accommodate six 500/115 kV transformers (five load-serving plus one spare) and the property of Valley Substation cannot be expanded due to roads, railroads, and development surrounding the substation. Additionally, this scenario raises concerns regarding potentially violating electrical design criteria (short-circuit duty) associated with three transformers operating in parallel. Finally, it does not satisfy the needs of the system to improve operational flexibility, reliability, and resilience. This alternative does not meet any of the PEA Project Objectives because it does not relieve electrical demand from the Valley South System that would exceed the two load-serving transformers, does not construct a new substation, and does not create system tie-lines for the Valley South System.

1.4.2.3 System Scenario 3: Transfer Electrical Demand from the Valley South 115 kV System to the Valley North 115 kV System

The Valley South to Valley North Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to SCE's existing Valley North 115 kV System via construction of new 115 kV subtransmission lines. This alternative would include 115 kV line scope to transfer SCE's Sun City and Newcomb 115/12 kV distribution substations to the Valley North System. Subtransmission line modifications in the Valley South System would also create two system-ties between the Valley South and Valley North Systems. The system tie-lines would only allow for the transfer of load from the Valley North System back to the Valley South System (either, or both, Sun City and Newcomb Substations). This alternative creates system tie-lines; however, the Planning Study analysis showed that the tie-lines do not benefit Valley South because no additional load could be transferred away from the Valley South System to the Valley North System (in the event of an unplanned outage to 115 kV lines or to one Valley South System transformer). This is because the next substation in line to be transferred is too heavily loaded and its transfer would adversely impact the ability to serve the customers further downstream because of the change in the system configuration. The tie-lines would benefit the Valley North System as load could be transferred back to the Valley South System should there be an outage of a Valley North System transformer, but the Valley North System already has sufficient tie-line capacity and is not the intended beneficiary of the project. This alternative would afford a modest improvement over existing conditions in events which would impact resiliency (specifically a high impact, low probability event affecting both Valley South System transformers).

The Planning Study and supporting analyses conclude that, while this alternative satisfies the system capacity needs of the Valley South System through 2043, it provides very limited reliability and resiliency benefits because the system tie-lines that would be established when load is transferred from the Valley South System to the Valley North System provide very limited ability to transfer additional load to the Valley North System in the event of abnormal operating conditions in the Valley South System.[~~7~~8]

The Planning Study and Cost/Benefit Analysis also considered the addition of Distributed Energy Resources (DER), represented for modelling purposes as distributed Battery Energy Storage Systems (BESS), to meet the capacity needs for a longer time period (through 2048). However, the addition of BESS does not substantially improve the effectiveness of System Alternative 3 in meeting the project reliability objective and it provides no added benefit of improving resilience.

1.4.2.4 System Scenario 4: Transfer Electrical Demand from the Valley South 115 kV System to the Valley North 115 kV System, and from the Valley North 115 kV System to the Vista 115 kV System

The Valley South to Valley North to Vista Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to the Valley North 115 kV System, and away from the Valley North 115 kV System to the Vista 115 kV System via construction of new 115 kV

[~~7~~8] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short- term, long-term and monetized benefits for each alternative.

subtransmission lines. This alternative would include 115 kV line scope to transfer SCE's Sun City and Newcomb 115/12 kV distribution substations from the Valley South System to the Valley North System, and the Moreno 115/12 kV distribution substation from the Valley North System to the Vista System. Subtransmission line construction and modifications in the Valley South System would create two system tie-lines between the Valley South System and the Valley North System. ~~The~~As with System Scenario 3, these system tie-lines would only allow for the transfer of load from the Valley North System back to the Valley South System (either, or both Sun City and Newcomb Substations). Subtransmission line construction and modifications in the Valley North System would maintain system tie-lines between the Valley North and Vista Systems. These system tie-lines would allow for the transfer of load from the Vista System back to the Valley North System (Moreno Substation) as well as the potential of transferring additional load from the Valley North System to the Vista System (Mayberry Substation) as needed.

The Planning Study[~~8~~9] and supporting analyses conclude that, while this alternative satisfies the system capacity needs of the Valley South System through 2043, it provides very limited reliability and resiliency benefits because the system tie lines that would be established when load is transferred from the Valley South System to the Valley North System provide limited ability to transfer additional load to the Valley North System in the event of an abnormal operating condition in the Valley South System. Additionally, the associated scope to implement the additional transfers from the Valley North System to the Vista System does not substantially improve the effectiveness of System Alternative 4 in meeting the PEA Project Objectives and is not cost effective. This alternative only shifts the capacity issues to the Valley North and Vista Systems causing the need to establish new projects in the near-term to address those capacity concerns.

1.4.2.5 System Scenario 5: Transfer Electrical Demand from the Valley South 115 kV System to a newly constructed 115 kV system adjacent to San Diego Gas & Electric

The San Diego Gas and Electric (SDG&E) Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to a new 230/115 kV system created at the southern boundary of the SCE service territory and adjacent to SDG&E's service territory. The new system would be providing power from the existing SDG&E 230 kV system via construction of a new 230/115 kV substation and looping in the existing SDG&E Escondido-Talega 230 kV transmission line. This alternative would include 115 kV subtransmission line scope to transfer SCE's Pauba and Pechanga 115/12 kV distribution substations to the newly formed 230/115 kV system. Subtransmission line construction and modifications in the Valley South System would also create two 115 kV system-tie lines between the Valley South System and the newly formed 230/115 kV SDG&E-sourced system. The system-tie lines would allow for the transfer of load from the new system back to the Valley South System (either, or both, of Pauba and Pechanga Substations) as well as additional load transfer from the Valley South System to the new system (Triton Substation and under certain high-impact, low probability events some of the load at Moraga Substation) as needed.

[~~8~~9] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short- term, long-term and monetized benefits for each alternative.

The Planning Study concluded that this alternative meets the PEA Project Objectives of the ASP. It satisfies the system capacity needs through 2040 and creates system tie-lines allowing some transfer of load out of the Valley South System to the newly created SDG&E 220/115 kV system, thus providing reliability/resiliency benefits. However, this system alternative performs worse in capacity system benefits (the ASP meets capacity needs through at least 2048), and is substantially worse in reliability/resiliency system benefits.[~~9~~10] Additionally, the project would have additional challenges to implement due to required coordination with SDG&E, significant construction of 220 kV transmission line facilities[~~10~~11] through rugged terrain and conservation land, as well as a need to acquire land rights from the Pechanga Tribe.

To extend the capacity benefits of the system alternative to 2048 and provide a capacity solution approximately equivalent to the ASP, augmenting the SDG&E System Alternative was considered to further reduce load in the Valley South System. Specifically, a new 115 kV connected substation with incremental battery energy storage system (BESS) additions would be constructed near the existing Auld or Pechanga Substation with a loop-in of a 115 kV line to interconnect it to the grid. This would add substantial additional costs and does not result in substantially improved capacity and/or reliability/resilience benefits on an absolute basis or compared to the ASP. The BESS additions would occur outside of SCE's typical project planning horizon. Thus, while the need to augment capacity through future scope and associated investment is an important consideration in the cost/benefit evaluation in the Planning Study, these prospective BESS additions are not considered in this PEA.

1.4.2.6 System Scenario 6: Transfer Electrical Demand from the Valley South 115 kV System to a new 220/115 kV Orange County System

The SCE Orange County Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to a new 115 kV system via construction of a new 220/115 kV substation and looping in the existing SONGS-Viejo 220 kV line. This alternative would include 115 kV subtransmission line scope to transfer SCE's existing Stadler and Tenaja 115/12 kV distribution substations from the Valley South System to the newly formed 220/115 kV system. The existing 115 kV subtransmission lines serving Stadler and Tenaja Substations would become two system-ties between the new 220/115 kV system and the Valley South System. The system-tie lines would allow for the transfer of load from the new system back to the Valley South System (either or both Stadler and Tenaja Substations) as well as additional load transfer from the Valley South System to the new system (Skylark Substation and under certain high-impact, low probability events, Moraga Substation) as needed.

The Planning Study concluded that this alternative meets the PEA Project Objectives of the ASP but performs substantially worse than the ASP from the perspective of reliability/resiliency

[~~9~~10] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short- term, long-term and monetized benefits for each alternative.

[~~10~~11] SDG&E's transmission system in the vicinity of this system alternative operates at 230 kV. In this area, SCE operates its transmission system at 220 kV. To avoid confusion, all transmission lines associated with this system alternative have been categorized as 220 kV.

benefits[~~11~~12] and is more expensive.[~~12~~13] Further it will be challenging to implement due to the required construction of extensive transmission line facilities through rugged, mountainous terrain, as well as Department of Defense (DoD), United States Forest Service, and conservation land.[~~13~~14]

1.4.2.7 System Scenario 7: Transfer Electrical Demand from the Valley South 115 kV System to a new 500/115 kV Menifee System

The Menifee Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to a new 500/115 kV system via construction of a new 500/115 kV substation and looping in the Serrano-Valley 500 kV transmission line. This alternative includes 115 kV subtransmission line scope to transfer SCE's Sun City and Newcomb 115/12 kV distribution substations to the newly formed 500/115 kV system. Subtransmission line construction and modifications in the Valley South System would also create two system-ties between the Valley South System and the newly formed 500/115 kV Menifee System. The system-tie lines would allow for the transfer of load from the new system back to the Valley South System (either or both Sun City and Newcomb Substations) as well as some additional load transfer (under certain extreme conditions) from the Valley South System to the new system.

The Planning Study and supporting analyses conclude that, while satisfying the system capacity needs through 2043, this alternative provides very limited reliability/resiliency benefits.[~~14~~15] The system tie lines that would be established when load is transferred from the Valley South System to the new Menifee System provide limited ability to transfer additional load in the event of abnormal operating conditions in the Valley South System. In addition, due to the close proximity of the new 500/115 kV Menifee Substation to the Valley Substation, there is no appreciable reliability/resiliency benefit that would otherwise be gained by a solution where the source substation was located in a geographically diverse location; therefore, limiting the impact of certain catastrophic events on both substations should they be located very near to each other.

1.4.2.8 System Scenario 8: Transfer Electrical Demand from the Valley South 115 kV System to a new 115 kV Mira Loma System

The Mira Loma Alternative proposes to transfer load away from SCE's existing Valley South 115 kV System to a new 115 kV system located in the City of Ontario just west of SCE's existing Mira Loma Substation via construction of a new 220/115 kV substation and looping in SCE's existing Mira Loma-Chino 220 kV transmission line. This alternative would also include 115 kV subtransmission line scope to facilitate the transfer of SCE's Ivyglen and Fogarty 115/12 kV distribution substations from the Valley South System to the new 220/115 kV system. The existing 115 kV subtransmission lines serving Ivyglen and Fogarty Substations would

[~~11~~12] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short-term, long-term and monetized benefits for each alternative.

[~~12~~13] Cost estimates for each alternative are compared in Section 8.1.1 and are detailed in Appendix C of the Planning Study.

[~~13~~14] Siting and routing of each alternative is described in Appendix C of the Planning Study.

[~~14~~15] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short-term, long-term, and monetized benefits for each alternative.

become two system-ties between the newly formed 220/115 kV Mira Loma System and the Valley South System.

The Planning Study concluded that this alternative meets the PEA Project Objectives of the ASP, but provides limited benefits over both short-term and longer-term study horizons because it would only meet capacity needs through 2031 and would have only marginally effective system tie-lines due to the resulting system topology.[~~15~~16] This is because while the created system-tie lines would allow for the transfer of all the load from the new 220/115 kV Mira Loma System back to the Valley South System (either or both Fogarty and Ivyglen Substations) should there be an unplanned outage in the new system, the ability to transfer additional load from the Valley South System to the new 220/115 kV Mira Loma System (during a similar type event) is limited to only Elsinore Substation and under certain high-impact, low probability events a portion of Skylark Substation. This results in the Mira Loma Alternative underperforming as compared to the ASP with respect to reliability/resiliency benefits during unplanned contingencies and more extreme high-impact, low probability events. Further it would be challenging to implement due to comparatively extensive (more than 20 miles) subtransmission construction through developed communities in Riverside County.[~~16~~17]

To extend the capacity benefits of this system alternative past the year 2031, SCE evaluated additional solutions to incrementally augment the new Mira Loma System through the addition of a centralized BESS in the Valley South System. A new 115 kV connected substation with incremental BESS additions would be constructed near Auld Substation with a loop-in of the existing Auld-Moraga #1 115 kV subtransmission line. This satisfies the capacity needs through 2048 but adds substantial costs and does not substantially improve system reliability/resilience benefits and overall performance. The BESS additions would be outside SCE's typical project planning horizon. Thus, while the need to augment capacity through future scope and associated investment is an important consideration in the cost/benefit evaluation in the Planning Study, these prospective BESS additions are not considered in this PEA.

1.4.2.9 System Scenario 9: Construct a Centralized Battery Energy Storage System in the Valley South 115 kV System

The Centralized Battery Energy Storage System (BESS) alternative proposes to reduce peak demand in the Valley South 115 kV System via construction of two new 115/12 kV substations with BESSs near Pechanga and Auld Substations, which would loop-in to the Pauba-Pechanga and Auld-Moraga #1 115 kV subtransmission lines, respectively.

The Planning Study concludes that although this system alternative can meet capacity needs through 2048 via incremental BESS additions, it does not meet the needs of the system which include improving operational flexibility, reliability, and resilience. Additionally, it does not meet PEA Project Objective 2 of providing system tie-lines between the Valley South System and a new 115 kV system to improve the reliability/resilience of the Valley South System.

[~~15~~16] See Sections 6.4 and 8.1.2 in the Planning Study for additional discussion and data related to short- term, long-term, and monetized benefits for each alternative.

[~~16~~17] Siting and routing of each alternative is described in Appendix C of the Planning Study.

1.4.2.10 System Scenario 10: No Project Alternative

Under the No Project Alternative, no action would be taken. The No Project Alternative would involve no construction and no modification of the existing system. There would be no electrical benefit to the No Project Alternative.

1.4.3 System Alternatives Evaluation Results

Construction of the ASP (System Scenario 1) would initially provide 1,120 MVA of additional capacity within the Electrical Needs Area and provide the ability to reliably serve long-term electrical demand from the Valley South 115 kV System through the transfer of five existing 115/12 kV substations from the Valley South 115 kV System to the proposed Alberhill 115 kV System. The transfers of these substations would reduce the loading of the Valley South 115 kV System by approximately 380 MVA, bringing the loading of the Valley South 115 kV System transformers to well within operating limits.

The ASP would also increase system reliability, resilience, and operational flexibility in the Electrical Needs Area by providing 115 kV subtransmission system tie-lines to the Valley South 115 kV System (which currently has none). These system tie-lines would allow SCE to transfer electrical service of substations between the two systems under both normal and abnormal conditions. The formation of Alberhill System in the Electrical Needs Area would also allow for the transfer of additional 115/12 kV substations from the Valley South 115 kV System to the Alberhill System if that becomes necessary in the future with relatively modest additional 115 kV line construction.

System Scenario 10 (the No Project Alternative) is not a viable scenario ~~since~~as it does not satisfy the system needs, does not meet any of the PEA Project Objectives, and it would prevent SCE from providing safe and reliable electrical service to its customers in the Electrical Needs Area. It would lead to frequent and prolonged electrical service interruptions and is therefore eliminated from further consideration.

System Scenarios 2, 3, 4, 7 and 9 are not viable scenarios because they are shown in the Planning Study to be ineffective in satisfying the PEA Project Objective to increase system operational flexibility and maintain system reliability by creating system ties that establish the ability to transfer substations from the current Valley South 115 kV System.

As a result, SCE is proposing construction of System Scenario 1, the ASP, to add transformer capacity to the Electrical Needs Area and to increase operational flexibility through creation of system tie-lines within the area presently served by the Valley South 115 kV System. System Scenarios 5, 6 and 8 are considered as additional Project Alternatives in Chapter 4 (Environmental Impact Assessment) because they satisfy the PEA Project Objectives but were demonstrated in the Planning Study to be inferior to Scenario 1 from the overall perspective of benefits, cost effectiveness, and risk.~~[17]~~[18]

~~[17]~~[18] See Section 8 of the Planning Study and Item I - "Detailed Justification of the Recommended Solution" attached to SCE's Compliance filing dated May 8, 2020

2.0 PROJECT ALTERNATIVES

The following sections describe the development of alternatives for the selection of the Alberhill Substation site, 500 kilovolt (kV) transmission line segments to serve the Alberhill Substation, the required 115 kV subtransmission line modifications, and alternatives for a new 115 kV subtransmission line. Additionally, descriptions of the three new system alternatives that were identified in Chapter 1, Purpose and Need are provided.

2.1 500/115 KV SUBSTATION SITE ALTERNATIVES

Site selection for the Alberhill Substation began with the development of a Substation Target Area that delineated an area within which the Alberhill Substation would have the maximum electrical benefit for the Electrical Needs Area, and meet both the ~~Purpose~~purpose and ~~Need~~need for the ~~project~~Alberhill System Project (Proposed Project or ASP) and be consistent with the ~~Basic Objectives~~basic objectives of the ~~project~~Proposed Project. The Substation Target Area was developed using the following basic requirements:

- The substation site should be in proximity to the Serrano-Valley 500 kV transmission line to facilitate connection of the new substation to Southern California Edison's (SCE's) existing 500 kV transmission system

- The substation site should be in proximity to existing 115 kV subtransmission lines to facilitate the transfer of existing 115/12 kV substations from the Valley South 115 kV System to the new Alberhill System

- The substation site should be in proximity to planned development along the I-15 corridor to facilitate service of additional 115 kV substations, should they become required in the future

Substation sites would require a minimum parcel size of 40 acres. After a review of available land of 40 acres or more, three potential substation sites were identified. These sites are shown on Figure 2.1, Substation Site Alternatives, and are described below. In addition, SCE also evaluated the Nevada Hydro Company's LEAPS[1] Lake Switchyard site, as described in Section 2.1.1, LEAPS Lake Switchyard Site, below.

2.1.1 LEAPS Lake Switchyard Site

Previous applications from the Nevada Hydro Company to the CPUC for a Certificate of Public Convenience and Necessity (CPCN) to construct the Lake Elsinore Advanced Pump Storage (LEAPS) project have included a proposed switchyard on property between the I-15 freeway and Temescal Canyon Road adjacent to Lee Lake. SCE evaluated the LEAPS Lake Switchyard Site~~,~~ and determined the site would be unsuitable for a 500/115 kV substation. The site is susceptible to liquefaction, and there is evidence of past faulting on and adjacent to the site. The site is less than 40 acres and is in a shape that cannot accommodate the substation equipment. In addition, the 500 kV lines would have to be constructed over Lee Lake, presenting engineering and

[1] In 2022, ownership of the LEAPS pumped storage hydro project was transferred to Bluewater Renewable Energy and the project is now named the Bluewater Renewable Energy Project.

maintenance issues and potential environmental impacts. As a result, SCE did not pursue this site as a viable substation site alternative.

2.1.2 Alternative Site A

Alternative Site A is approximately 124 acres, on the north side of the intersection of Temescal Canyon Road and Concordia Ranch Road. It has been previously disturbed and is presently used as a horse farm. Although much of the northern part of the property has steep topography, a sufficient portion of the southern portion of the property is flat. This parcel has been designated light industrial in the Riverside County General Plan. This site is a viable site for the Alberhill Substation.

2.1.3 Alternative Site B

Alternative Site B is located on a west-facing slope of the Gavilan Hills. This site consists of two 80 acre parcels, totaling 160 acres. These parcels are not located adjacent to an existing paved road and would require cutting into the slope midway up the mountain along with extensive grading to accommodate the substation. This grading would be more than required for Alternative Site A. As a result, SCE did not pursue this site as a viable substation site alternative.

2.1.4 Alternative Site C

Alternative Site C consists of 45 acres located adjacent to and east of Alternative Site A. Although the size of the site is above the 40 acres needed for the substation, the site would require that the substation incorporate gas-insulated switchgear (GIS) on both the high side and low side of the transformer banks in order to conserve space, increasing the cost of constructing and operating the substation. Extensive blasting/fracturing would be required for site preparation. Extensive waste material would be required to be removed from the site. As a result, SCE did not pursue this site as a practical substation site alternative.

2.1.5 Alberhill Substation Site Selection

The only viable and practical substation site identified during the siting process was Alternative Site A. As a result, SCE selected this site to construct the Alberhill Substation. The entire substation property would total approximately 124 acres. Due to the mountainous nature of the property, approximately 34 acres would be devoted to the substation and its surrounding improvements such as landscaping and access roads. With the exception of a portion of the site dedicated to the 500 kV transmission lines leading to the substation, the remaining property would not be disturbed.

2.2 ALBERHILL SYSTEM PROJECT 500 KV TRANSMISSION LINES SEGMENTS

After the site selection for the Alberhill Substation concluded, SCE commenced development of 500 kV transmission line segment options to access the existing Serrano-Valley 500 kV transmission line to source the new substation. During this process, seven alternative routes were developed. These segments are shown on Figure 2.2a, 500 kV Transmission Line Segment Alternatives. Two additional segments were added in March 2011. All of these segments are described below.

Figure 2.1
Substation Site Alternatives

Substation Site Alternatives

Subtransmission Lines

Existing 115-161 kV (SCE, 2009)

Major Transmission Lines

Existing 500 kV (SCE, 2009)

N W E S

0 0.14 Miles

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CONFIDENTIAL - Contains Critical Energy Infrastructure Information
Contact Corporate Security (27910) for handling/storage requirements, if any questions.

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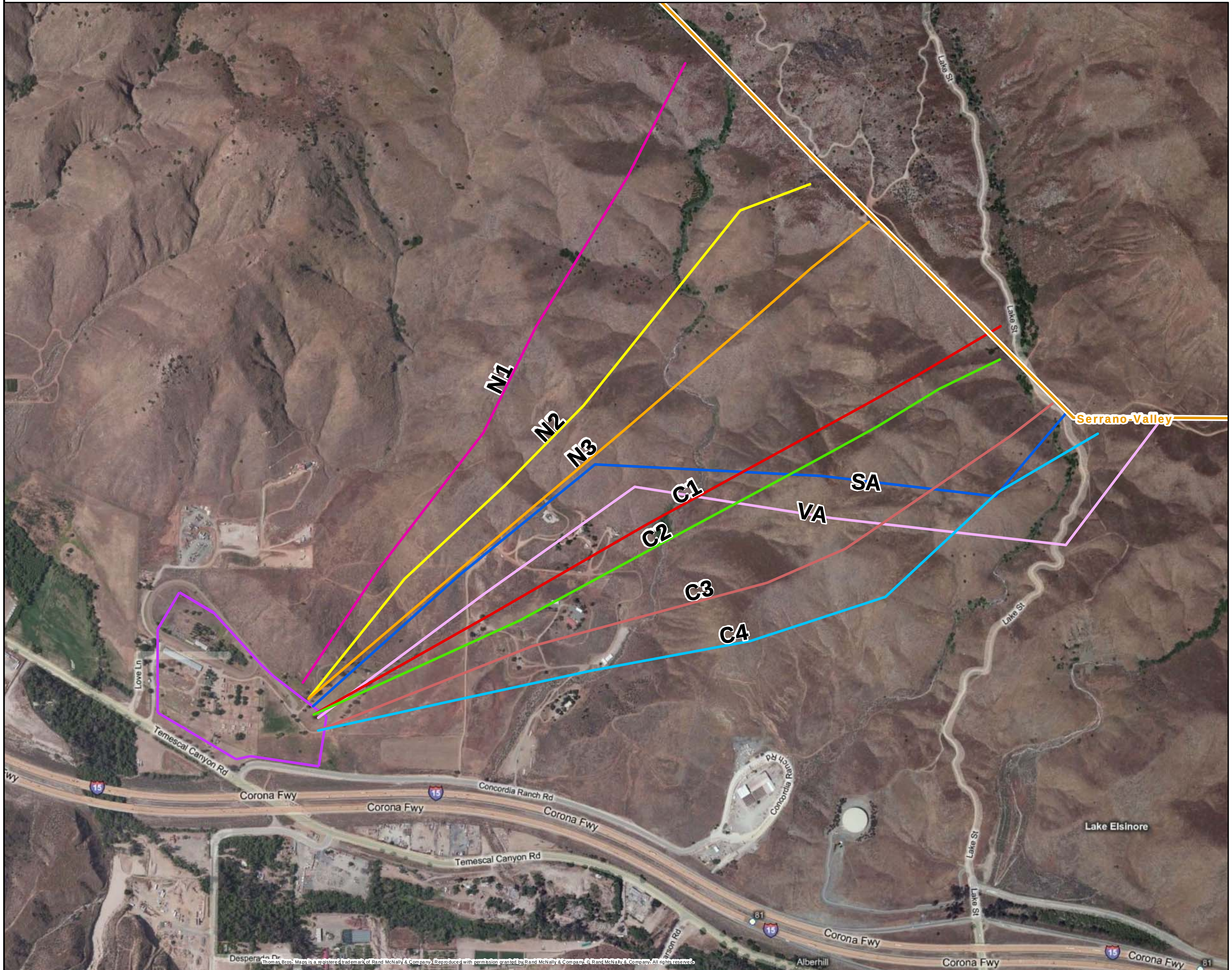
Figure 2.2a
500 kV Transmission Line Segment Alternatives



500kV Transmission Alternatives

- Segment C1
- Segment C2
- Segment C3
- Segment C4
- Segment N1
- Segment N2
- Segment N3
- Segment SA
- Segment VA
- Existing 500 kV (SCE, 2006)
- Proposed Alberhill Substation

N
W E
S

0 0.2 Miles

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All the segments originate at the Alberhill Substation and extend into a mountainous area through Critical Habitat for the California gnatcatcher (federally threatened), as well as conservation land (or land designated for conservation) to the existing Serrano-Valley 500 kV transmission line. These features are also shown on Figure 2.2a, 500 kV Transmission Line Alternative Segments. There are two types of conservation land in the area that is crossed by one or more of the segments:

- Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP) Core Reserve: This land has been established as part of the SKR HCP for the conservation, preservation, restoration and enhancement of the SKR and its habitat.
- Designated conservation land for the Western Riverside County Multiple Species Habitat Conservation Plan (WRMSHCP): This land is presently owned by Riverside County and is designated to have ownership transferred to the Regional Conservation Authority for conservation under the WRMSHCP.

Each segments' distinctive features are described below.

- Segment N1: This segment crosses an area with the steepest topographic features, and some tower sites may not be accessible by road and would require helicopter construction. This segment crosses land designated as SKR HCP Core Reserve.
- Segment N2: This segment would have a greater number of dead-end structures, adding to the cost, and some tower sites may not be accessible by road and would require helicopter construction. This segment crosses land designated as SKR HCP Core Reserve.
- Segment N3: One of the straightest segments, minimizing the need for extensive engineering and minimizing use of large-sized towers. This segment crosses land designated as SKR HCP Core Reserve.
- Segment C1: One of the straightest segments, minimizing the need for extensive engineering and minimizing use of large-sized towers. This segment crosses land designated as SKR HCP Core Reserve.
- Segment C2: There is a residence in very close proximity to the segment, and the construction effort would require entry onto land managed by the Bureau of Land Management. This segment crosses land designated as SKR HCP Core Reserve.
- Segment C3: The construction effort would require entry onto land managed by the Bureau of Land Management. This segment crosses land designated as SKR HCP Core Reserve.
- Segment C4: The longest segment of the N and C segments, and would have a comparatively greater number of large-sized towers and access roads. This segment crosses land designated as SKR HCP Core Reserve.

- Segment SA: Approximately one-half mile longer than the N and C segments, this segment would avoid the SKR HCP Core Reserve.

- Segment VA: Approximately one-half mile longer than the N and C segments, this segment would avoid the SKR HCP Core Reserve and span the designated conservation land for the WRMSHCP.

2.2.1 Alberhill System Project 500 kV Transmission Line Segment Selection

SCE selected Segments N3 and C1 as the 500 kV transmission line segments to connect the Alberhill Substation to the existing Serrano-Valley 500 kV transmission line. These two segments are anticipated to have the fewest construction issues, and would require the fewest number of large-sized towers.

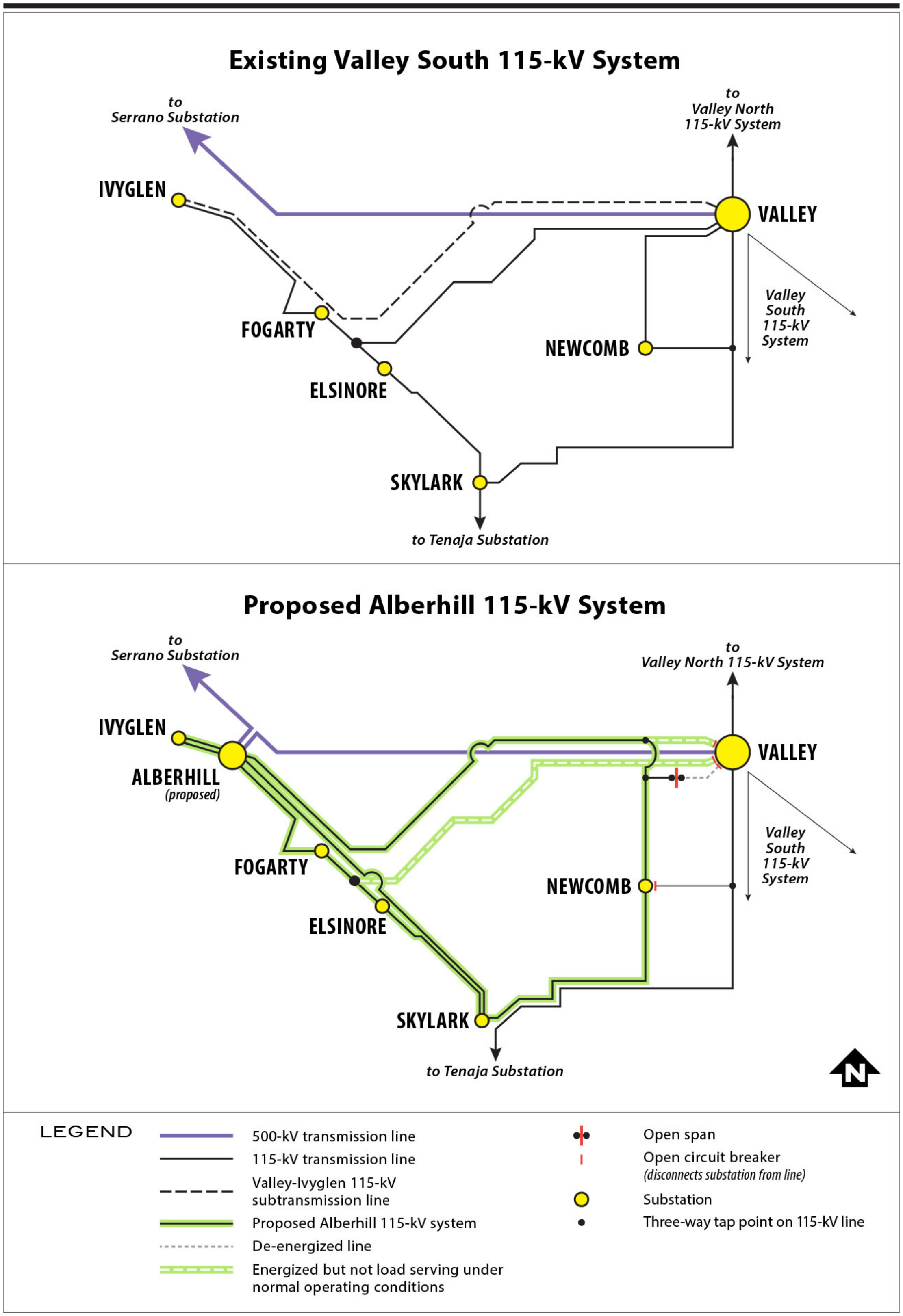
Segment SA and Segment VA are now being proposed as potential 500 kV segments. Both SA and VA would avoid the SKR HCP Core Reserve.

2.3 ALBERHILL SYSTEM PROJECT 115 KV SUBTRANSMISSION LINES

SCE evaluated the ability of the existing subtransmission lines to support the transfer of the Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations to the new Alberhill 115 kV system. As a result of this evaluation, portions of four existing 115 kV subtransmission lines were identified as requiring additions or extensions in order to reliably serve existing substations from the new Alberhill Substation. This change in configuration is shown on Figure 2.3a, ~~Alberhill System Configuration.~~Technical Schematic of Existing and Proposed Systems. The existing lines that require additional circuits are described in detail in Chapter 3, Project Description.

As shown on Figure 2.3a, ~~Alberhill System Configuration, there is no~~ Technical Schematic of Existing and Proposed Systems, for the existing ~~connection between~~ Valley South 115-kV System, the Valley-Newcomb ~~Substation and~~ -Skylark ~~Substation. Both Newcomb Substation and~~ 115 kV line will be reconfigured just outside of Skylark Substation ~~are presently connected~~ to become the Valley-Newcomb-Tenaja 115 kV line. This allows for Skylark Substation to be separated from ~~two separate subtransmission lines, each originating at~~the Valley ~~Substation. Because both Newcomb Substation~~South 115 kV System and transferred to the Alberhill 115 kV System. To ensure sufficient and reliable service after the reconfiguration and transfer, a new line to Skylark Substation would be ~~served from the new~~ constructed from Newcomb Substation to complete the loop and is shown in the Proposed Alberhill ~~System, a connection is necessary between Newcomb and Skylark Substations to maintain the minimum number of source lines for each substation.~~115-kV System in Figure 2.3a. Two potential routes for this new 115 kV subtransmission ~~routes~~line were identified to accomplish this connection and are described below.

Figure 2.3a ~~Alberhill System Configuration~~Technical Schematic of Existing and Proposed Systems



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2.3.1 New 115 kV Subtransmission Line Segment Alternatives Considered for Alberhill System Project

2.3.1.1 New 115 kV Subtransmission Line Segment Alternative 1

New 115 kV Subtransmission Line Segment Alternative 1 originates at the intersection of Newport Road and Murrieta Road in the City of Menifee. The route travels south along an existing SCE distribution line route on the west side of Murrieta Road to the intersection of Murrieta Road and Bundy Canyon Road where it would connect to the Valley-Skylark 115 kV subtransmission line ROW. The entire segment alternative would follow SCE's existing distribution lines.

In total, New 115 kV Subtransmission Line Segment Alternative 1 is approximately 3 miles long, and crosses land that is presently undeveloped, rural residential, or is used as an exterior buffer for new housing developments.

2.3.1.2 New 115 kV Subtransmission Segment Alternative 2

New 115 kV Subtransmission Line Segment Alternative 2 originates at the intersection of Newport and Murrieta Roads in the City of Menifee. The route travels south along an existing distribution line on the west side of Murrieta Road for approximately 1 mile to the intersection of Murrieta Road and Holland Road, and then turns west on Holland Road for approximately 0.5 miles to the intersection of Holland Road and Byers Road. The route would travel south and west on Byers Road for approximately 2 miles and then follow Waldon Road for approximately 0.5 miles to the intersection of Waldon Road and Bundy Canyon Drive and the Valley-Skylark 115 kV subtransmission line ROW. The entire segment alternative would follow SCE's existing distribution lines.

In total, New 115 kV Subtransmission Line Segment Alternative 2 is approximately 4 miles long, and crosses land that is presently undeveloped or is used for rural residential purposes.

2.3.2 New 115 kV Subtransmission Line Segment Alternative Recommendation

Both New 115 kV Subtransmission Segment Alternatives 1 and 2 have the ability to serve the Alberhill ~~Substation~~System Project. However, New 115 kV Subtransmission Line Segment Alternative 1 would be built along paved roads, facilitating access for construction and maintenance. New 115 kV Subtransmission Line Segment Alternative 1 is also shorter in length, slightly reducing the amount of new construction required for the ~~project~~Proposed Project.

New 115 kV Subtransmission Segment Alternative 2 would require construction on unpaved roads in hilly terrain along a route that is slightly longer in length. This would require more earthwork and dust control during construction.

For these reasons, New 115 kV Line Segment Alternative 1 was selected as the preferred route.

2.4 NEW SYSTEM ALTERNATIVES

The subsections that follow provide a brief description of the San Diego Gas & Electric Company (SDG&E), SCE Orange County, and Mira Loma system alternatives.[~~1~~2]

2.4.1 SDG&E

The SDG&E system alternative would include the following components:

- Construct a new 220/115 kV substation (approximately 15-acre footprint)
- Construct a new 220 kV double-circuit transmission line between SDG&E's existing Escondido-Talega 220 kV[~~2~~3] transmission line and SCE's new 220/115 kV substation (approximately 7.2 miles)
- Construct a new 115 kV double-circuit subtransmission line between SCE's new 220/115 kV substation and SCE's existing 115 kV Pechanga Substation (approximately 2.0 miles)
- Demolish SCE's existing 115 kV switchrack at SCE's existing 115 kV Pechanga Substation and reconstruct it on an adjacent parcel (approximately 3.2-acre footprint)
- Double-circuit SCE's existing Pauba-Pechanga 115 kV subtransmission line (approximately 7.5 miles)
- Double-circuit a segment of SCE's existing Auld-Moraga #2 115 kV subtransmission line (approximately 0.3 mile)

This system alternative would require the construction of approximately 9.2 miles of new 220 kV transmission and 115 kV subtransmission lines and the modification of approximately 7.8 miles of existing 115 kV subtransmission line. This system alternative totals approximately 17 miles. A detailed description of each of these components is provided in the subsections that follow.

2.4.1.1 New 220/115 kV Substation

The Proposed Project would involve the construction of a new, approximately 15-acre, 220/115 kV substation on a privately owned, approximately 56.4-acre, vacant parcel. The parcel is located north of Highway 79, between the intersections with Los Caballos Road and Pauba Road in Riverside County. The parcel is trapezoidal in shape and is bounded by residences and equestrian facilities to the north, east, and west; and Highway 79 and vacant land to the south. SCE may establish vehicular access to the site from Los Corralitos Road or Highway 79.

[~~1~~2] Additional detail can be found in the Planning Study attached to SCE's Motion to Supplement the Record filed on May 8, 2020.

[~~2~~3] SDG&E's transmission system in the vicinity of this system alternative operates at 230 kV. In this area, SCE operates its transmission system at 220 kV. To avoid confusion, all transmission lines associated with this system alternative have been categorized as 220 kV.

2.4.1.2 New 220 kV Double-Circuit Transmission Line

A new 220 kV double-circuit transmission line would be constructed, connecting the new 220/115 kV substation to SDG&E's existing Escondido-Talega 220 kV transmission line. This new 220 kV transmission line would begin at SDG&E's existing Escondido-Talega 220 kV transmission line approximately 0.6 miles northeast of the intersection of Rainbow Heights Road and Anderson Road in the community of Rainbow in San Diego County. The line would leave the interconnection with SDG&E's existing Escondido-Talega 220 kV transmission line on new structures extending to the northeast for approximately 0.8 mile. At this point, the new line would enter Riverside County and the Pechanga Reservation for approximately 4.0 miles. The line would continue in a generally northeast direction for approximately 1.0 mile before exiting the Pechanga Reservation[~~3~~4] and continuing until intersecting Highway 79. At the intersection with Highway 79, the line would extend northwest and parallel to Highway 79 for approximately 1.0 mile until reaching the new 220/115 kV substation. This segment of the system alternative would be approximately 7.2 miles in length.

2.4.1.3 New 115 kV Double-Circuit Subtransmission Line

A new 115 kV double-circuit subtransmission line would be constructed, connecting the new 220/115 kV substation to SCE's existing 115 kV Pechanga Substation. The line would depart the new 220/115 kV substation to the northwest on new structures for approximately 1.5 miles while traveling parallel to Highway 79. Near the intersection of Highway 79 and Anza Road, the line would transition to an underground configuration and continue along Highway 79 for approximately 0.5 mile until reaching SCE's existing 115 kV Pechanga Substation. This segment of the system alternative would be approximately 2.0 miles in length.

2.4.1.4 Demolish and Reconstruct an Existing 115 kV Switchrack

SCE currently operates the existing 115 kV Pechanga Substation that is located on an approximately 3.2-acre, SCE-owned parcel approximately 0.2 miles northeast of the intersection of Highway 79 and Horizon View Street. This site is bounded by vacant land to the east and west and residential uses to the north and south. SCE would demolish this existing 115 kV switchrack and reconstruct it on an approximately 16.9-acre, privately owned site that is directly east of the existing substation. The new 115 kV switchrack would occupy approximately 3.2 acres within the parcel.

2.4.1.5 Double-Circuit Existing 115 kV Subtransmission Lines

Pauba-Pechanga

SCE currently operates an existing 115 kV single-circuit subtransmission line between SCE's existing 115 kV Pauba and Pechanga Substations in Riverside County. This existing line would be converted to a double-circuit configuration, adding a new 115 kV circuit between SCE's existing 115 kV Pauba and Pechanga Substations. The existing line departs SCE's existing 115 kV Pechanga Substation and extends east along Highway 79 until reaching Anza Road. At the intersection of Highway 79 and Anza Road, the line extends northeast along Anza Road until reaching De Portola Road. At this intersection, the line extends generally northeast along De

[~~3~~4] Approximately 0.5 mile of this segment of the line would be located outside of the Pechanga Reservation.

Portola Road until intersecting Monte De Oro Road, then the line extends west along Monte De Oro Road until reaching Rancho California Road. At this point, the line extends south along Rancho California Road and terminates at SCE's existing 115 kV Pauba Substation. This segment of the system alternative is approximately 7.5 miles in length.

Auld-Moraga #2

SCE currently operates an existing 115 kV single-circuit subtransmission line between SCE's existing 115 kV Auld Substation in the City of Murrieta and SCE's existing 115 kV Moraga Substation in the City of Temecula. An approximately 0.3-mile segment of this line within the City of Temecula would be converted from a single-circuit to double-circuit configuration. This segment would begin near the intersection of Rancho California Road and Calle Aragon. The existing line then extends south before turning west and intersecting Margarita Road, approximately 0.2 miles northwest of Rancho Vista Road.

2.4.2 SCE Orange County

The SCE Orange County system alternative would include the following components:

- Construct a new 220/115 kV substation (approximately 15-acre footprint)
- Construct a new 220 kV double-circuit transmission line between SCE's existing San Onofre-Viejo 220 kV transmission line and SCE's new 220/115 kV substation (approximately 22.6 miles)
- Construct a new 115 kV single-circuit subtransmission line between SCE's new 220/115 kV substation and SCE's existing 115 kV Tenaja Substation (approximately 5.0 miles)
- Construct a new 115 kV single-circuit subtransmission line between SCE's new 220/115 kV substation and SCE's existing 115 kV Stadler Substation (approximately 2.6 miles)

In total, this system alternative would require the construction of approximately 30.2 miles of new 220 kV transmission and 115 kV subtransmission lines. A detailed description of each of these components is provided in the subsections that follow.

2.4.2.1 New 220/115 kV Substation

The SCE Orange County system alternative would involve the construction of a new, approximately 15-acre, 220/115 kV substation on a privately owned, approximately 67.3-acre, vacant parcel. The parcel is located southeast of Tenaja Road in the City of Murrieta. The parcel is generally trapezoidal in shape and surrounded by hilly, undeveloped land to the south and generally flat, undeveloped land to the north. SCE may establish vehicular access to this site from Tenaja Road, which is currently an unpaved road.

2.4.2.2 New 220 kV Double-Circuit Transmission Line

A new 220 kV double-circuit transmission line would be constructed, connecting the new 220/115 kV substation to SCE's existing San Onofre-Viejo 220 kV transmission line. This new

220 kV transmission line would begin at the existing San Onofre-Viejo 220 kV transmission line approximately 0.2 mile southwest of the intersection of East Avenida Pico and Camino la Pedriza in the City of San Clemente in Orange County. The line would leave the interconnection with the San Onofre-Viejo 220 kV transmission line on new structures to the east for approximately 3.2 miles. At this point, the new line would enter San Diego County, generally paralleling Talega Road and SDG&E's existing Escondido-Talega 220 kV transmission line for approximately 3.1 miles,[45] reaching the intersection of Talega Road and Indian Potrero Truck Trail. The line would then extend southeast, briefly crossing Cleveland National Forest (CNF), then extending east generally parallel to SDG&E's existing Escondido-Talega 220 kV transmission line for approximately 2.2 miles. The line would continue east, crossing CNF for approximately 5.5 miles, then turn to the northeast for approximately 1.9 miles before entering Riverside County. At this point, the line would extend generally northeast until reaching the new 220/115 kV substation site. Approximately 4.7 miles of this portion of the route would cross the Santa Rosa Plateau Ecological Preserve. This segment of the system alternative would total approximately 22.6 miles.

2.4.2.3 New 115 kV Single-Circuit Subtransmission Lines

New Substation to Tenaja Substation

A new 115 kV single-circuit subtransmission line would be constructed, connecting the new 220/115 kV substation to SCE's existing 115 kV Tenaja Substation. The line would begin at the proposed new substation site in the City of Murrieta and extend generally north on new structures until intersecting Tenaja Road. At this point, the line would extend northeast along Tenaja Road, Vineyard Parkway, and Lemon Street until intersecting SCE's existing Stadler-Tenaja 115 kV subtransmission line at Adams Avenue. At this point, the new 115 kV subtransmission line and Stadler-Tenaja 115 kV subtransmission line would be co-located on a single set of structures until reaching SCE's existing 115 kV Tenaja Substation. The existing line travels generally northwest along Adams Avenue, southwest on Nutmeg Street, and then continues in a northwest direction along Washington Avenue. At the end of Washington Avenue, the route enters the City of Wildomar and continues northwest along Palomar Street until reaching Clinton Keith Road. At the intersection with Clinton Keith Road, the route travels south until terminating at SCE's existing 115 kV Tenaja Substation. This segment of the system alternative would be approximately 5.0 miles in length.

New Substation to Stadler Substation

A new 115 kV single-circuit subtransmission line would be constructed, connecting the new 220/115 kV substation site to SCE's existing 115 kV Stadler Substation. The line would begin at the proposed new substation site in the City of Murrieta and extend northeast for approximately 0.1 mile on new structures. At this point, the line would extend southeast, crossing the Santa Rosa Plateau Ecological Preserve for approximately 0.6 mile. The line would extend northeast, leaving the Santa Rosa Plateau Ecological Preserve, and parallel Ivy Street until the intersection with Jefferson Avenue. At this intersection, the new 115 kV subtransmission line would be co-located on a single set of structures with SCE's existing Stadler-Tenaja 115 kV subtransmission line for approximately 0.2 mile along Los Alamos Road until terminating at SCE's existing

[45] Approximately 0.4 mile of this portion of the line would cross back into Orange County.

115 kV Stadler Substation. This segment of the system alternative would be approximately 2.6 miles in length.

2.4.3 Mira Loma

The Mira Loma system alternative would include the following components:

- Construct a new 220/115 kV substation (approximately 15-acre footprint)
- Construct a new 220 kV double-circuit transmission line segment to loop SCE's existing Chino-Mira Loma 220 kV transmission line into SCE's new 220/115 kV substation (approximately 130 feet)
- Construct a new 115 kV double-circuit subtransmission line between SCE's new 220/115 kV substation and SCE's existing 115 kV Ivyglen Substation (approximately 21.6 miles)
- Construct a new 115 kV single-circuit subtransmission line segment to tap SCE's future Valley-Ivyglen 115 kV subtransmission line to SCE's existing 115 kV Fogarty Substation (approximately 0.6 mile)

This system alternative would require the construction of approximately 22.2 miles of new 220 kV transmission and 115 kV subtransmission lines. A detailed description of each of these components is provided in the subsections that follow.

2.4.3.1 New 220/115 kV Substation

The Mira Loma system alternative would involve the construction of a new, approximately 15-acre, 220/115 kV substation on a privately owned, approximately 27-acre, vacant parcel. The parcel is located north of Ontario Ranch Road, east of Haven Avenue, and west of Hamner Avenue in the City of Ontario. The parcel is rectangular in shape and is bounded by vacant land to the north, SCE's existing 220 kV Mira Loma Substation and vacant land to the east, vacant land to the south, and vacant land and industrial uses to the west. The vacant parcel has a residential land use designation, and an existing SCE transmission corridor crosses the southeast portion of the site. Vehicular access would likely be established from Ontario Ranch Road.

2.4.3.2 New 220 kV Double-Circuit Transmission Line

A new 220 kV double-circuit transmission line segment would be constructed between the existing Chino-Mira Loma 220 kV transmission line and SCE's new 220/115 kV substation. This approximately 130-foot segment would begin within SCE's existing transmission corridor and approximately 2,000 feet east of Haven Avenue, and would extend south until reaching SCE's new 220/115 kV substation site.

2.4.3.3 New 115 kV Double-Circuit Subtransmission Line

A new 115 kV double-circuit subtransmission line would be constructed, connecting SCE's new 220/115 kV substation and SCE's existing 115 kV Ivyglen Substation. This line would exit the new 220/115 kV substation site from the southerly portion of the property and travel east in an underground configuration along Ontario Ranch Road for approximately 0.2 mile. The line would pass under SCE's existing transmission line corridor and then transition to an overhead configuration, continuing on new structures along Ontario Ranch Road for approximately 0.5 mile until intersecting Hamner Road. The line would then extend south along Hamner Road and parallel to SCE's existing Mira Loma-Corona 66 kV subtransmission line for approximately 6.8 miles. Within this approximately 6.8-mile portion of the route, the line would exit the City of Ontario and enter the City of Eastvale at the intersection with Bellegrave Avenue. Within the City of Eastvale, the line would continue along Hamner Avenue, cross the Santa Ana River, and enter the City of Norco. Within the City of Norco, the line would continue south along Hamner Avenue until intersecting 1st Street. At this point, the line would extend west along 1st Street for approximately 0.5 mile until West Parkridge Avenue. At this intersection, the line would enter the City of Corona and continue generally south along North Lincoln Avenue for approximately 3.2 miles, paralleling the Chase-Corona-Databank 66 kV subtransmission line between Railroad Street and West Ontario Avenue. At the intersection with West Ontario Avenue, the line would extend east and continue to parallel SCE's existing Chase-Corona-Databank 66 kV subtransmission line for approximately 1.4 miles until the intersection with Magnolia Avenue. The line would continue to extend along West Ontario Avenue for approximately 0.2 mile, then parallel SCE's existing Chase-Jefferson 66 kV subtransmission line between Kellogg Avenue and Interstate (I-) 15 for approximately 1.7 miles. The line would continue along East Ontario Avenue, pass under I-15, and exit the City of Corona after approximately 0.2 mile at the intersection of East Ontario Avenue and State Street. The line would extend southeast along East Ontario Avenue within Riverside County for approximately 1.8 miles until the intersection of Cajalco Road. At this intersection, the line would extend southeast along Temescal Canyon Road, crossing the City of Corona for approximately 1.2 miles between Cajalco Road and Dos Lagos Drive. The line would then continue within Riverside County along Temescal Canyon Road for approximately 3.9 miles, crossing under I-15 and terminating at SCE's existing 115 kV Ivyglen Substation. This segment of the system alternative would be approximately 21.6 miles in length.

2.4.3.4 New 115 kV Single-Circuit Subtransmission Line

A new 115 kV single-circuit subtransmission line segment would be constructed to tap SCE's future Valley-Ivyglen 115 kV subtransmission line into SCE's existing 115 kV Fogarty Substation. The new line segment would begin along the future Valley-Ivyglen 115 kV subtransmission line's alignment, approximately 680 feet southeast of the intersection of Pierce Street and Baker Street in the City of Lake Elsinore. The new line segment would extend generally southwest and parallel to SCE's existing Valley-Elsinore-Fogarty 115 kV subtransmission line until terminating at SCE's existing 115 kV Fogarty Substation. This segment of the system alternative would be approximately 0.6 mile in length.

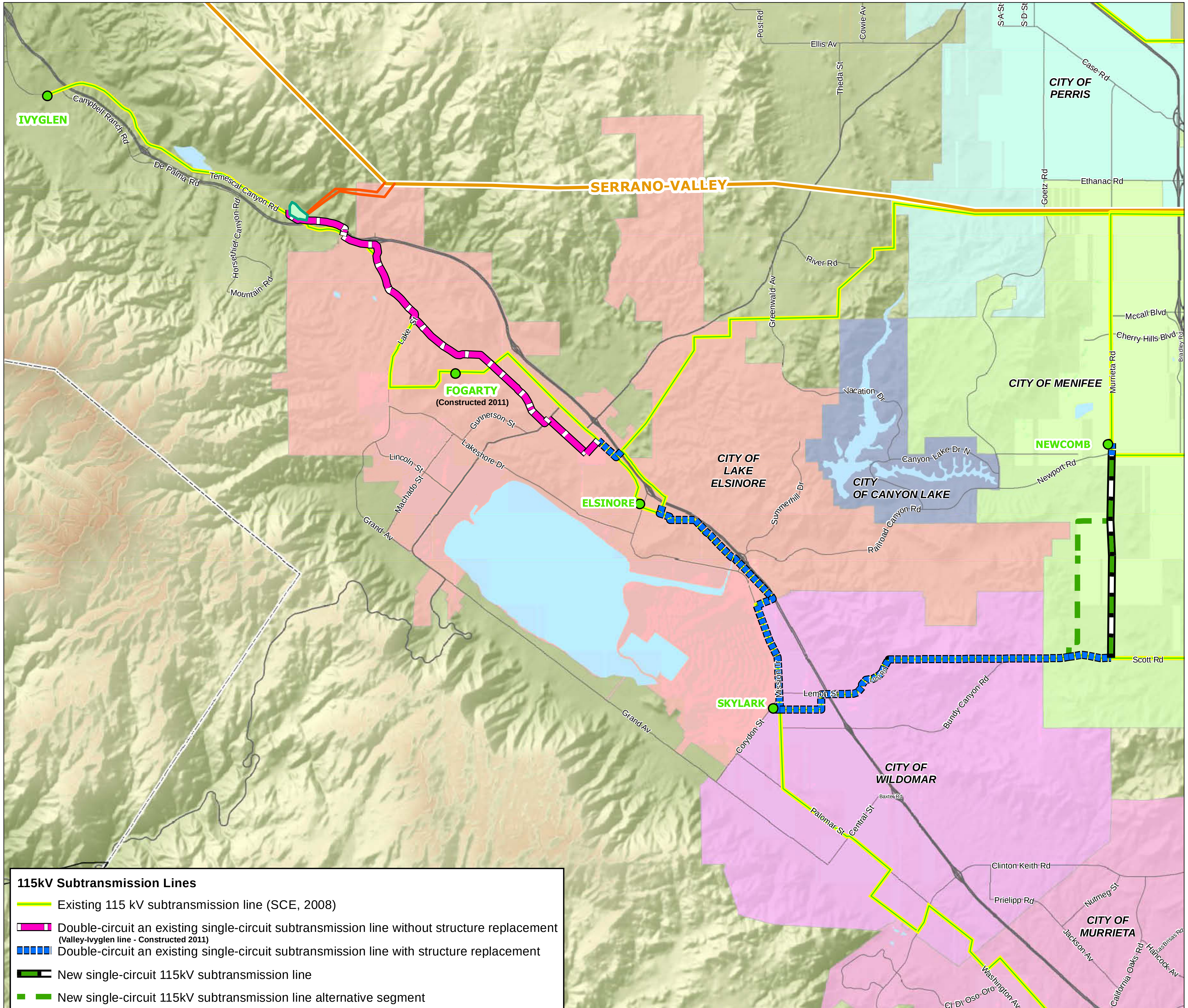
2.5 PROPOSED PROJECT

SCE proposes to construct the Alberhill System Project utilizing the Substation Site Alternative A, 500 kV transmission line segments SA and VA, and New 115 kV Subtransmission Line Segment Alternative 1 (Proposed Project). The Proposed Project meets the basic objectives of the Alberhill System Project, and is described in detail in Chapter 3, Project Description.

New 115 kV Subtransmission Line Segment Alternative 2 is evaluated in the original Proponent's Environmental Assessment (PEA) as an Alternative 115 kV Segment to the Proposed Project. Additionally, three system alternatives are evaluated in this ~~second~~third amendment to the PEA as system alternatives to the Proposed Project.

These components are shown on Figure 2.4a, Proposed Project and Alternative and on Figures 2.4b, SDG&E System Alternative; 2.4c, SCE Orange County System Alternative; and 2.4d, Mira Loma System Alternative.

Figure 2.4a
Proposed Project and Alternative



Substations

Proposed Alberhill Substation

Substations (SCE, 2008)

500kV Transmission Lines (SCE, 2007)

Existing 500 kV Transmission Lines (SCE, 2007)

Proposed 500kV Alternative Routes

Basemap Data

Transportation Lines (TBM, 2008)

SCE Service Territory Boundary (SCE, 2006)

County Boundaries (TBM, 2008)

Water Features (TBM, 2008)

N W E S

0 0.5 1 2 Miles

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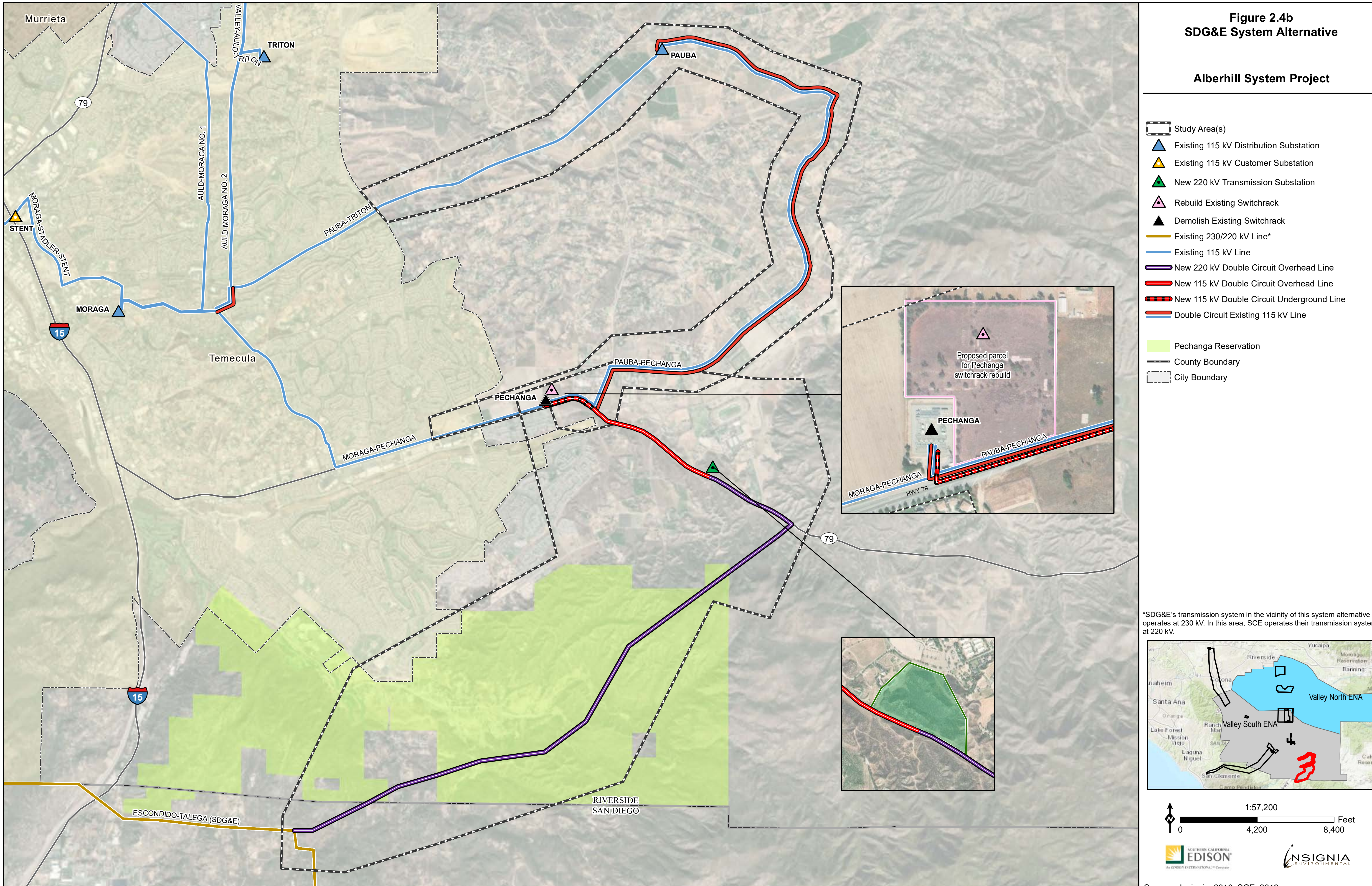
Murrieta
Temecula
TRITON
PAUBA
STENT
MORAGA
PECHANGA
PAUBA-TRITON
PAUBA-PECHANGA
MORAGA-PECHANGA
MORAGA-STADLER-STENT
AULD-MORAGA NO.1
AULD-MORAGA NO.2
VALLEY-AULD-TRITON
ESCONDIDO-TALEGA (SDG&E)
RIVERSIDE
SAN DIEGO
79
15
Proposed parcel
for Pechanga
switchrack rebuild
HWY 79
Figure 2.4b
SDG&E System Alternative
Alberhill System Project
Study Area(s)
Existing 115 kV Distribution Substation
Existing 115 kV Customer Substation
New 220 kV Transmission Substation
Rebuild Existing Switchrack
Demolish Existing Switchrack
Existing 230/220 kV Line*
Existing 115 kV Line
New 220 kV Double Circuit Overhead Line
New 115 kV Double Circuit Overhead Line
New 115 kV Double Circuit Underground Line
Double Circuit Existing 115 kV Line
Pechanga Reservation
County Boundary
City Boundary
*SDG&E's transmission system in the vicinity of this system alternative operates at 230 kV. In this area, SCE operates their transmission system at 220 kV.
Valley North ENA
Valley South ENA
Riverside
Santa Ana
San Clemente
1:57,200
0 4,200 8,400
Feet
EDISON
INSIGNIA ENVIRONMENTAL
Sources: Insignia, 2019; SCE, 2019

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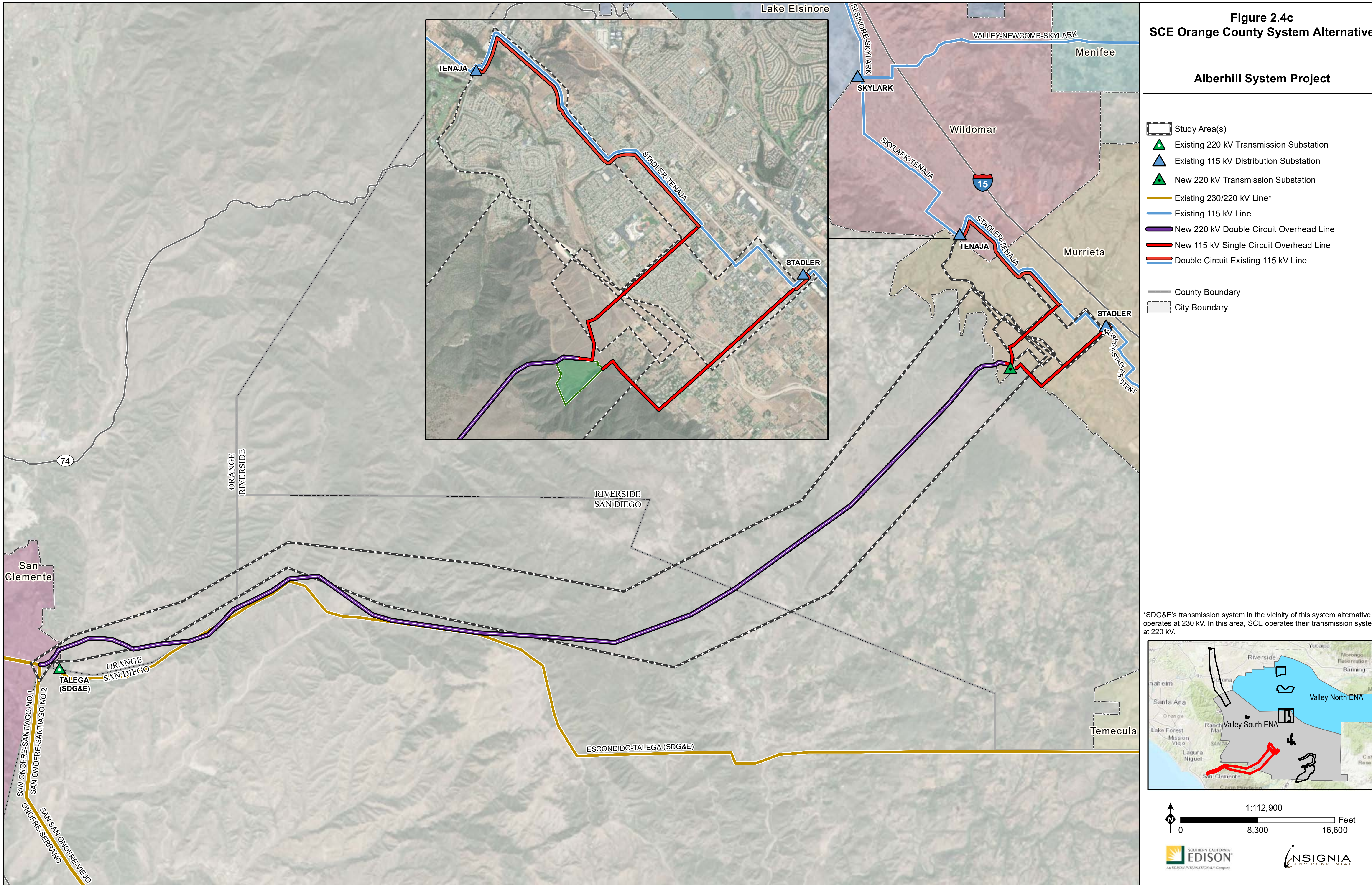
Figure 2.4c
SCE Orange County System Alternative

Alberhill System Project



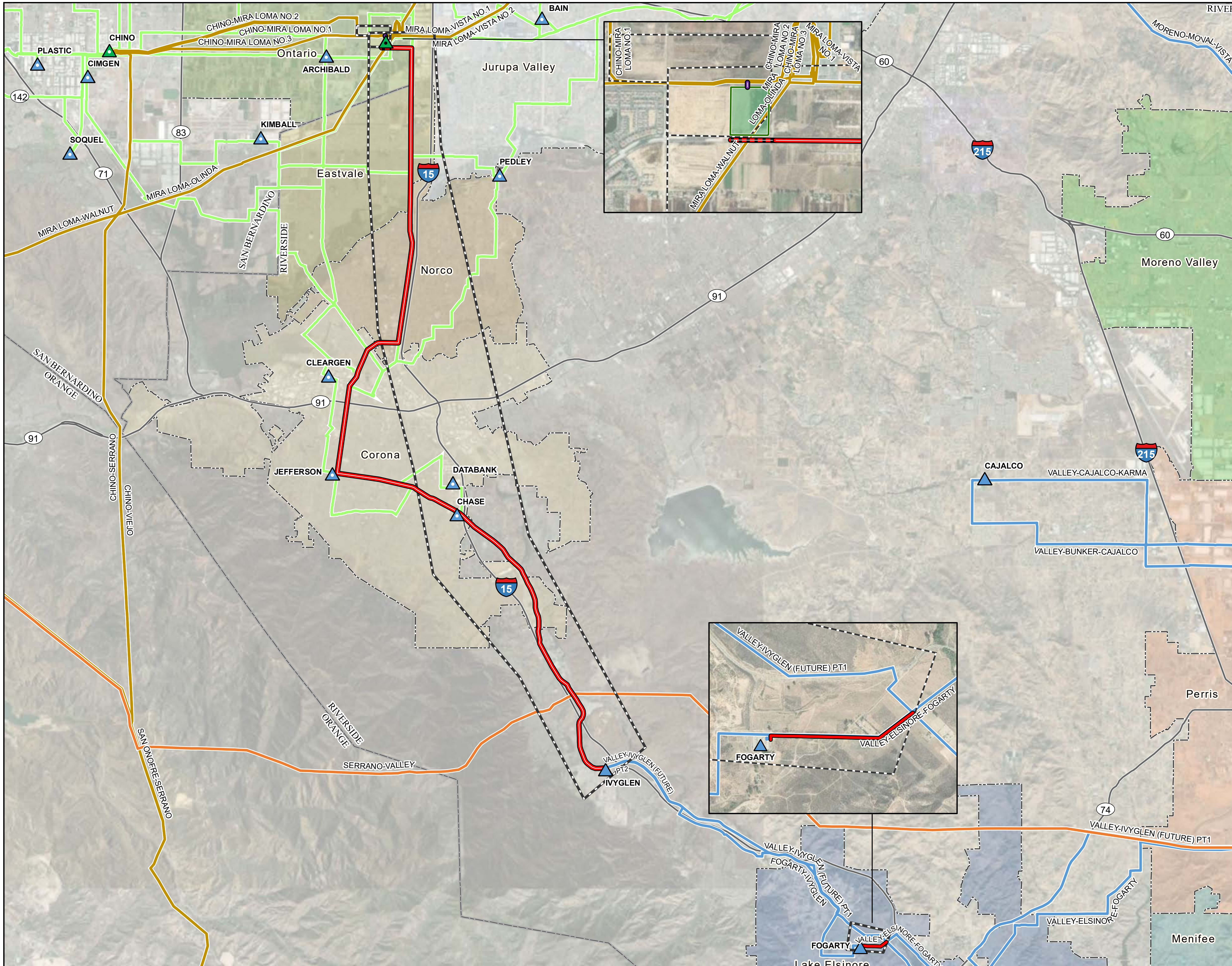
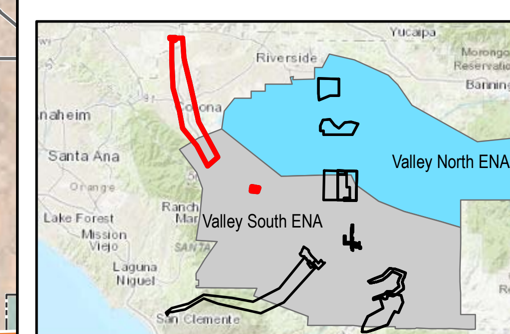


Figure 2.4d
Mira Loma System Alternative

Alberhill System Project

- Study Area(s)
- Existing 220 kV Transmission Substation
- Existing 115 kV Distribution Substation
- Existing 66 kV Distribution Substation
- New 220 kV Transmission Substation
- Existing 500 kV Line
- Existing 220 kV Line
- Existing 115 kV Line
- Existing 66 kV Line
- New 220 kV Double Circuit Overhead Line
- New 115 kV Double Circuit Overhead Line
- New 115 kV Single Circuit Overhead Line
- New 115 kV Double Circuit Underground Line
- County Boundary
- City Boundary



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Sources: Insignia, 2019; SCE, 2019

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3.0 PROJECT DESCRIPTION

As described in the Executive Summary, this third amendment to the Proponent's Environmental Assessment incorporates a design modification and additional engineering refinements into the Original Alberhill System Project (Original ASP). These changes to the Original ASP are described in more detail in Appendix M: Revised Project Description and supersede the discussion that follows. The changes to the Original ASP design are summarized and depicted in Appendix N: Project Design Comparison.

~~The proposed Alberhill System Project~~The Original ASP includes the following components:

- Construction of a new 1,120 MVA 500/115 kV substation to increase electrical service capacity to the area presently served by the Valley South 115 kV System
- Construction of two new 500 kV transmission line segments to connect the new substation to SCE's existing Serrano-Valley 500 kV transmission line
- Construction of a new 115 kV subtransmission line and modifications to existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations (Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations) presently served by the Valley South 115 kV System to the new 500/115 kV substation
- Installation of telecommunications improvements to connect the new facilities to SCE's telecommunications network

The ~~Proposed Project~~Original ASP is described in more detail below. The Alberhill Substation would be constructed in unincorporated Riverside County. Construction of the 500 kV transmission line segments between the Alberhill Substation and the existing Serrano-Valley 500 kV transmission line would occur in unincorporated Riverside County and within the northwestern boundary of the City of Lake Elsinore. The new and modified 115 kV subtransmission lines would be constructed in unincorporated Riverside County and the cities of Lake Elsinore, Wildomar, and Menifee.

3.1 ~~PROPOSED PROJECT~~ORIGINAL ASP COMPONENTS

3.1.1 Alberhill Substation Description

The Proposed Alberhill Substation would be an unstaffed, automated, 1,120 MVA 500/115 kV substation capable of an ultimate buildout of 1,680 MVA. Because the substation would be located in an area susceptible to earthquake forces, the substation structures would be designed consistent with the Institute of Electrical and Electronic Engineers (IEEE) 693, Recommended Practices for Seismic Design of Substations. Its components are described in more detail below.

3.1.1.1 500 kV Switchrack

The proposed 500 kV switchrack would be comprised of gas-insulated switchgear contained within a steel enclosure measuring approximately 350 feet long, 60 feet wide, and 49 feet in height. Four dead end structures would be erected outside the gas-insulated switchgear enclosure to facilitate connections between the two 500 kV transmission line segments and the switchrack, and each would be approximately 90 feet long and 108 feet high.

The 500 kV switchrack would consist of six positions with two operating buses and arranged in a breaker-and-a-half configuration. Initially, four positions would be installed. Four positions would be equipped for two 500 kV line positions and two transformer bank positions.

3.1.1.2 115 kV Switchrack

The 115 kV switchrack would consist of eleven bays with two operating buses in a breaker-and-a-half configuration. Initially, seven positions would be installed. One position would be equipped for bus sectionalization, and five positions would be equipped for five 115 kV lines and two 115 kV transformer bank positions. One position would remain empty but is necessary to maintain the alignment of the 115 kV lines as they exit the substation. The 115 kV switchrack would use a high and low dead-end structure with heights of 60 feet and 43 feet, respectively.

3.1.1.3 Transformers

Transformation would initially occur using two 560 MVA 500/115 kV transformers, with an ultimate capability for three transformers in service, plus the spare transformer as required by SCE’s Transmission Planning Criteria and Guidelines. Each 560 MVA transformer would be approximately 37 feet high.

3.1.1.4 Capacitor Banks

One 115 kV capacitor bank rated at 46.8 megavolts ampere reactive (MVAR) would be installed with a circuit breaker and a disconnect switch. The capacitor bank would be approximately 14 feet high. In addition, should they be required at a future date, space is reserved at the substation site for three additional 115 kV capacitor banks and two 500 kV capacitor banks.

3.1.1.5 Control Building

The monitoring equipment for the substation would be located in a permanent control building structure that would typically be constructed of concrete block, and would include a full basement. This building would require a building permit, and would be designed consistent with the applicable California Building Code standards for the area. The control building would be equipped with air conditioning, control and relay panels, a battery and battery charger, AC and DC distribution, a human-machine interface rack, communication equipment, and local alarms. The control building dimensions would be approximately 64 feet wide, 110 feet long, and 20 feet high.

3.1.1.6 Substation Electrical Power

The new substation would have three independent sources of electrical power for the control building and other ancillary facilities. The primary source of power to the control building would be an output of one of the substation’s main transformers. A second source would be a nearby distribution line that would be connected to the substation site. For use in case of emergency, one 500 kVA 120/240 volt 3-phase stationary backup generator would be installed at the substation site for emergency backup power. It would have a diesel tank capable of storing approximately

960 gallons of fuel. The stationary generator would be permitted by the South Coast Air Quality Management District.

3.1.1.7 Restroom Facility

A stand-alone prefabricated permanent restroom would be installed within the substation perimeter near the control building. Domestic water is currently available at the site and would serve the restroom as well as irrigation required for landscaping. The site is not served by a public sewer system, so a new septic system would be installed and permitted by Riverside County. The restroom enclosure would be approximately 10 feet high, 10 feet long and 10 feet wide.

3.1.1.8 Substation Access

Presently, access to the proposed substation site and to privately owned properties to the north of the substation site is attained from Temescal Canyon Road along an unpaved private road leading to Love Lane at the north of the substation site. The present location of this road is within the footprint of Alberhill Substation, and would have to be relocated prior to substation construction.

The private road would be relocated to the western boundary of the substation property and serve as the primary access to the substation's main gate. The relocated private road would become a 36-foot wide paved road extending approximately 250 feet north of Temescal Canyon Road. At that point a 30-foot wide paved substation access driveway would connect to the main substation gate. The remainder of the relocated private road would be unpaved and would extend to the north joining with the existing unpaved Love Lane, approximately 400 feet north of the substation entrance.

The substation entrance would have an electrically operated gate for two-way traffic access into the substation (shown on Figure 3.1a, Alberhill Substation Layout). A similar secondary access gate would be located on Temescal Canyon Road. A third manually operated gate located at the eastern end of the substation would provide access to the 500 kV transmission line corridors. All access gates would be a minimum of 8 feet in height. The primary and secondary gates would be approximately 40 feet wide while the transmission line access gate would be 24 feet wide. In addition, SCE would install a walk-in gate within the substation wall for additional access into the substation.

Within the substation enclosure, one 45-foot wide driveway and a series of 30-foot wide driveways would facilitate vehicular movement around the substation equipment. In addition, a 7,600 square foot parking area would be constructed within the substation enclosure for vehicular parking.

3.1.1.9 Substation Site Preparation

Water Line Relocation

An existing 30 inch gravity agricultural water line owned and operated by the Elsinore Valley Municipal Water District (EVMWD) currently crosses through the proposed substation site. Relocation of this water line would be required prior to any substation grading or construction. The relocation of this line is not expected to have any impact on local water service.

The new water line alignment would begin with a connection to the existing pipe at the southeast corner of the substation site near Temescal Canyon Road, and continue in a northwest direction to follow the relocated private road, and connect to the existing water line at the northwest corner of the substation site. On average, the trench excavated to install the new water line would be approximately 4 feet wide and 6 feet deep, and be approximately 1,700 feet long. SCE would consult with EVMWD prior to construction, and would build the new water line to EVMWD specifications. The existing pipe would be removed and disposed of off-site.

3.1.1.10 Substation Drainage

The substation site would be graded to a slope between one and two percent and compacted to 90 percent of the maximum dry density. Construction of the substation would interrupt the existing drainage patterns throughout the site and would require diversion around the substation to areas where percolation would continue or through channels and pipes to be installed to the existing discharge point at the Temescal Wash along the southwest corner of the substation property. The drainage would be designed to maintain a discharge of stormwater runoff from the site consistent with that currently experienced at the site. SCE would consult with Riverside County prior to finalizing the substation drainage design.

3.1.1.11 Substation Site Ground Surface Improvements

The ground surface of the substation site would be finished with materials imported to the site and materials excavated and used on the site. These materials, and their approximate square footage and volumes are listed in Table 3.1, Substation Ground Surface Improvement Materials and Volumes.

Based on preliminary design, approximately 8,000 cubic yards of soil, vegetation, and rock would be removed from the site. Any waste material would be handled as described in Section 3.7, Waste Management.

Approximately 10,000 cubic yards of soil would be excavated as a result of excavation for foundation and building footings. This soil would be stock piled during excavation and ultimately would be graded and compacted on site.

The substation grading design would incorporate Spill Prevention Control and Countermeasure (SPCC) Plan requirements due to the planned operation of oil-filled transformers at the substation (in accordance with 40 CFR Part 112.1 through Part 112.7). Typical SPCC features include secondary containment, curbs, berms, and basins designed and installed to contain spills, should they occur. These features would be part of SCE’s final engineering design for the ~~Proposed Project~~Original ASP.

Figure 3.1a
Alberhill Substation Layout

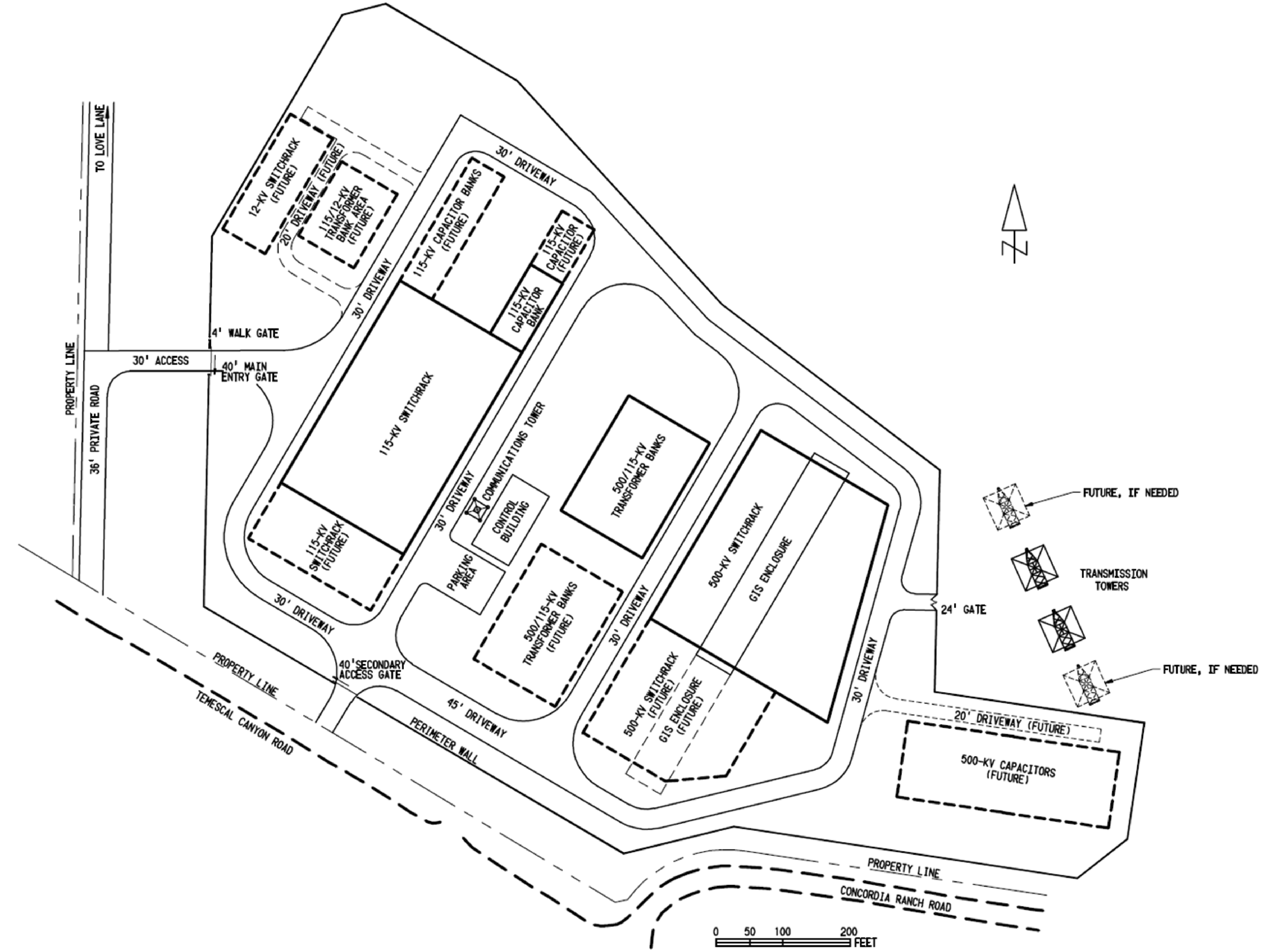

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Table 3.1 Substation Ground Surface Improvement Materials and Volumes

Element	Material	Approximate Surface Area (sq ft)	Approximate volume (cu yd)
Site grading, cut	Soil	740,000	70,000
Site grading, fill[1]	Soil	740,000	63,000
Drainage structures	Concrete	12,500	650
Substation equipment foundations	Concrete	49,000	10,000
Cable trenches[2]	Concrete	80	6
Water line relocation	Soil	68,000	1,500
Internal driveways	Asphalt Concrete/Class II aggregate	140,000	3,400
External roads	Asphalt Concrete/Class II aggregate	16,000	500
Rock surfacing	Crushed rock	870,000	10,800
Wall foundation	Concrete	4,300	320

Notes:
[1] Includes allowances for shrinkage and settlement.
[2] The concrete cable trenches are factory fabricated and delivered to the site.

3.1.1.12 Substation Lighting

The proposed substation would have access and maintenance lighting. The access lighting would be low-intensity and controlled by a photo sensor. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. Maintenance lights would be used only when required for maintenance outages or emergency repairs occurring at night. The lights would be located in the switchracks, around the transformer banks, and in areas of the substation where maintenance activity may take place, and would be directed downward and shielded to reduce glare outside the facility.

Each gate at the substation would have a beacon light installed for safety and security purposes. It would be illuminated only while the gate is open or in motion. Typically, SCE utilizes double flash strobe lights as beacon lights on substation gates.

3.1.1.13 Substation Perimeter

An 8-foot high perimeter wall would surround the substation. The wall would be made of concrete panels or decorative block, consistent with safety standards for major electrical facilities, and consistent with surrounding community standards (subject to the requirements of SCE). At a minimum, a band of at least three strands of barbed wire would be affixed near the top of the perimeter wall inside of the substation and would not be visible from the outside.

Landscaping and irrigation would be installed after the substation wall is constructed. Prior to the start of the substation construction, SCE would develop a landscaping and irrigation plan that is consistent with surrounding community standards.

3.1.2 500 kV Transmission Line Connection

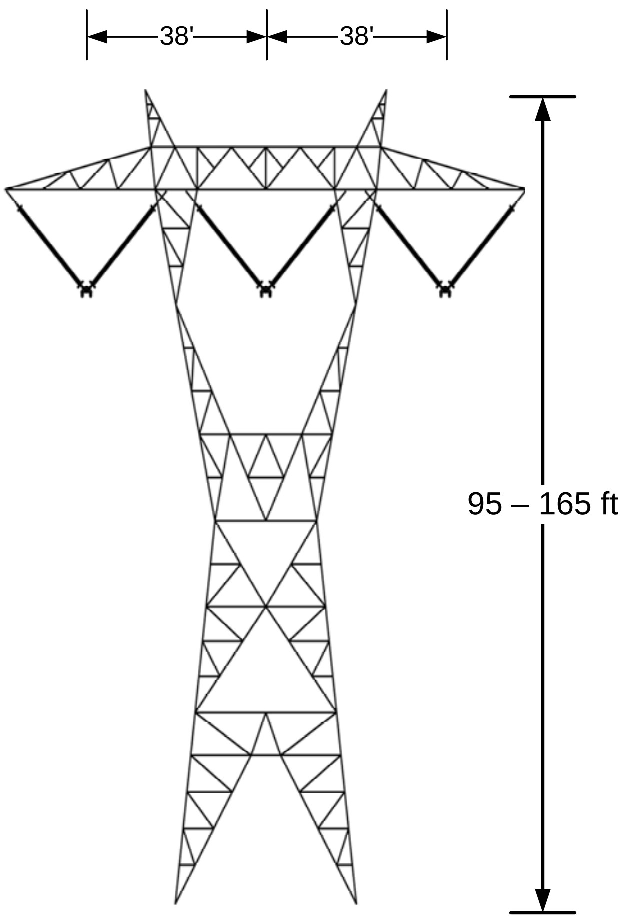
Two new 500 kV transmission line segments would connect the Alberhill Substation to the existing Serrano-Valley 500 kV transmission line. To reliably operate the ~~Proposed Project~~Original ASP, two 500 kV transmission line segments on separate structures are required to interconnect the substation to the Serrano-Valley 500 kV transmission line as shown on Figure 2.4, Proposed Project and Alternative. The northern segment is approximately 1.6 miles long, and the southern segment is approximately 1.7 miles long.

Construction of the two 500 kV transmission line segments would require approximately two double circuit and ten single circuit lattice towers. Each segment would utilize approximately one double circuit tower and five single circuit towers. At the connection points on the Serrano-Valley 500 kV transmission line, two of the existing structures would be replaced utilizing two of the new structures mentioned above.

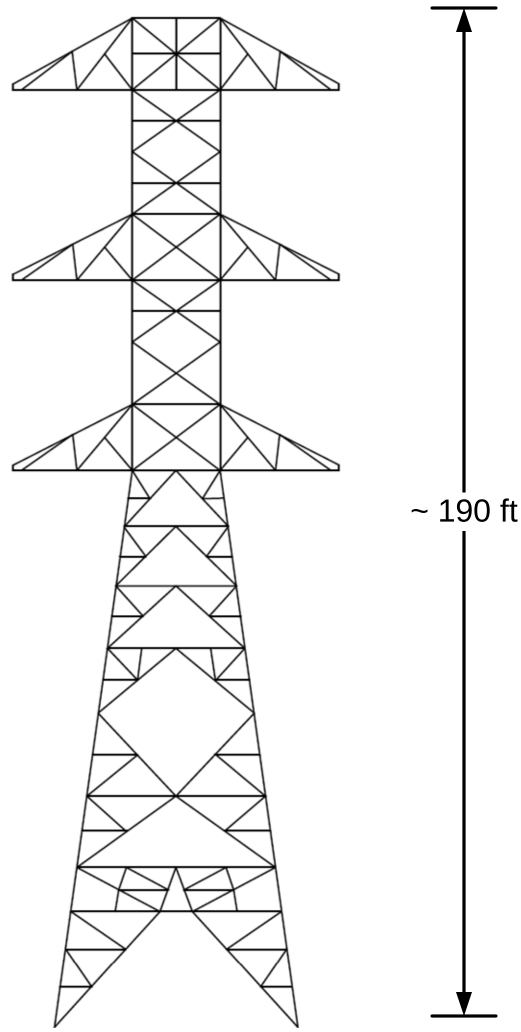
Based on preliminary designs, the towers would have a dull galvanized steel finish and would range in height from approximately 95 to 190 feet, with span lengths between towers ranging between approximately 400 to 2,100 feet. Lattice steel structures require four excavated holes typically 3 to 6 feet in diameter and 20 to 45 feet deep. On average each foundation would extend above the ground between approximately 1 to 4 feet. See Figure 3.2a, Typical 500 kV Transmission Structures, for a depiction of tower designs for the 500 kV line segment structures. The information presented in this section is based on preliminary engineering and design, and refinement during final engineering design may result in components that are modified from the descriptions provided in this PEA.

The towers used for the 500 kV transmission line segments would support 2,156 kcmil non-specular aluminum conductor steel reinforced (ACSR) conductors, polymer insulators, and two overhead groundwires (OHGW) for shielding.

Each structure site would require 24-hour vehicular access during operation of the ~~Proposed Project~~Original ASP for emergency and maintenance activities. Approximately 2 miles of 14-wide access roads and spur roads would be installed with the 500 kV transmission line segments ROW. The road may be wider in areas that require slope stabilization. Existing and new access roads and spur roads for the ~~Proposed Project~~Original ASP are shown in Appendix D, Proposed Project Road Story.



Typical
Single-circuit 500 kV Tower



Typical
Double-circuit 500 kV Tower

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Figure 3.2a

Typical 500 kV Structures

3.1.3 115 kV Subtransmission Line Description

The Original Alberhill System Project would require modification of existing 115 kV subtransmission facilities and construction of new 115 kV subtransmission facilities. The modification of existing 115 kV facilities include:

- Double-circuit an existing single-circuit 115 kV subtransmission line without structure replacement (approximately 6.5 miles)
- Double-circuit an existing single-circuit 115 kV subtransmission line with structure replacement (approximately 8 miles)
- Replace two existing poles with new poles at an existing I-15 freeway crossing

In addition, the Original Alberhill System Project would require the following new facilities:

- Construct a new 115 kV subtransmission line (approximately 3 miles)
- Install new 115 kV subtransmission structures at the Alberhill Substation site
- Install new 115 kV subtransmission structures within SCE's existing Serrano-Valley 500 kV corridor

These components are shown on Figure 3.3a, 115 kV Subtransmission Line Description, and are described in detail in the sections below.

Construction of the new and modified 115 kV subtransmission lines would utilize light weight steel (LWS) poles, tubular steel poles (TSPs), and H-frames. Each structure would support polymer insulators, 954 stranded aluminum conductor and a single 4/0 aluminum conductor steel reinforced conductor for grounding. If needed, 954 aluminum conductor steel reinforced ground conductor would be used at locations requiring higher tension.

The dimensions of these structures are shown on Figure 3.4a, Typical 115 kV Subtransmission Structures, and summarized in Table 3.2, Typical 115 kV Subtransmission Structure Dimensions. Because the ~~Proposed Project~~Original ASP is located in a raptor concentration area, all 115 kV subtransmission structures would be designed to be consistent with the Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006.[1]

Light weight steel poles would be direct buried and extend approximately 65 to 91 feet above ground. The diameter of LWS poles are typically 1.5 to 2 feet at the base, and taper to approximately 1 foot at the top of the pole. Approximately 304 LWS poles would be utilized for the ~~Proposed Project~~Original ASP.

[1] Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006 is published by the Edison Electric Institute and the Avian Power Line Interaction Committee in collaboration with the Raptor Research Foundation.

Table 3.2 Typical Subtransmission Structure Dimensions

Pole Type	Approximate Diameter	Approximate Height Above Ground	Approximate Auger hole Depth	Approximate Auger Diameter
Light Weight Steel (LWS)†	Between 1.5 and 2.5 feet	Between 65 and 91 feet	Between 7 and 10 feet	Between 2 and 3 feet
Tubular Steel Pole (TSP)	Between 2 and 4 feet	Between 70 and 100 feet	Not applicable	Not applicable
TSP Concrete Foundation	Between 5 to 8 feet	2 feet	Between 20 and 40 feet	Between 5 and 8 feet

Note: Specific pole height and spacing would be determined upon final engineering and would be constructed in compliance with CPUC General Order 95.
† The H-frames would utilize two LWS poles approximately 12 feet apart

The TSPs are used in areas where the length and strength of LWS poles are inadequate, such as freeway crossings, turning points, and other locations where extra structure strength is required. The TSPs utilized for the ~~Proposed Project~~Original ASP would extend between 70 feet and 100 feet above ground, and the tallest poles would be used at crossings of the I-15 freeway. The TSPs would be attached to a concrete foundation approximately 5 to 8 feet in diameter that extends between approximately 20 to 40 feet below ground and may extend up to 2 feet above ground. Approximately 40 TSPs would be utilized for the ~~Proposed Project~~Original ASP.

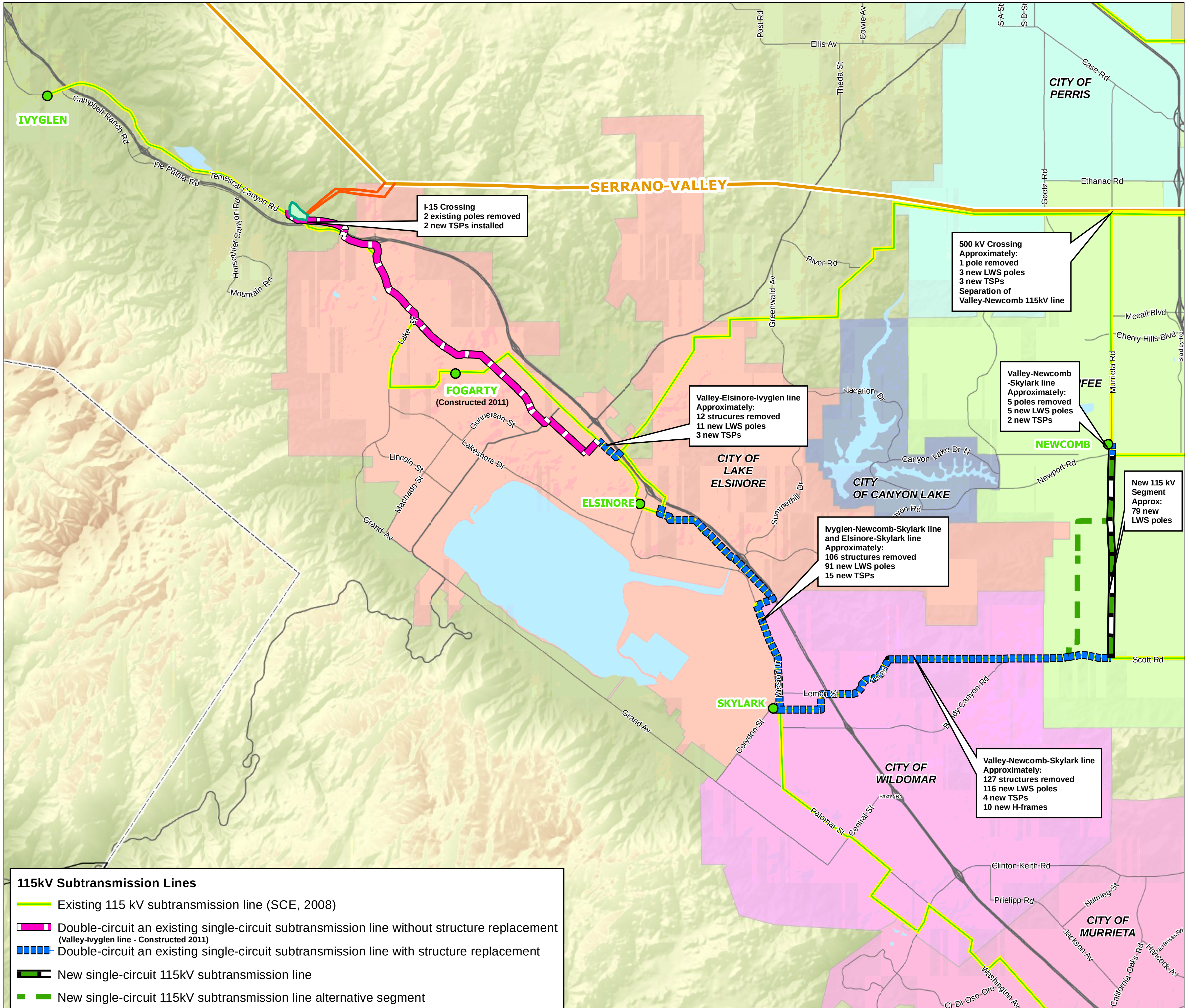
H-frame structures would also be used for the ~~Proposed Project~~Original ASP. H-frames are used in areas where extra structure strength is required. These structures are shown on Figure 3.4a, Typical 115 kV Subtransmission Structures, and would range in height from approximately 65 feet to 75 feet above ground. Approximately 10 H-frames would be utilized for the ~~Proposed Project~~Original ASP.

3.1.3.1 Double-circuit an existing single-circuit 115 kV subtransmission line without structure replacement

~~Pending approval from the CPUC, SCE will be constructing a new~~SCE has constructed a 115 kV subtransmission line between Valley Substation and Ivyglen Substation as part of the Valley-Ivyglen/Fogarty Project (CPUC Application Nos. A.07-01-031 and A.07-04-028).

The Original Alberhill System Project would require that an approximate 6.5 mile portion of the Valley-Ivyglen 115 kV subtransmission line be double-circuited between the Alberhill Substation site and the intersection of Third Street and Collier Avenue. Because the new Valley-Ivyglen 115 kV subtransmission line has been designed to support two circuits, it is not anticipated that additional structures or structure replacement would be required. This portion of the Alberhill 115 kV subtransmission line modifications would require the addition of crossarms, anchors, insulators, and 954 SAC to existing structures.

Figure 3.3a
115 kV Subtransmission Line Description



Substations

- Proposed Alberhill Substation
- Substations (SCE, 2008)

500kV Transmission Lines (SCE, 2007)

- Existing 500 kV Transmission Lines (SCE, 2007)
- Proposed 500kV Alternative Routes

Basemap Data

- Transportation Lines (TBM, 2008)
- SCE Service Territory Boundary (SCE, 2006)
- County Boundaries (TBM, 2008)
- Water Features (TBM, 2008)

N S E W

0 0.5 1 2 Miles

Oregon Idaho Nevada Utah Arizona California Area Shown at Left SCE Service Territory Pacific Ocean

Features depicted herein are planning level accuracy, and intended for informational purposes only. Distances and locations may be distorted at this scale. Always consult with the proper legal documents or agencies regarding such features.

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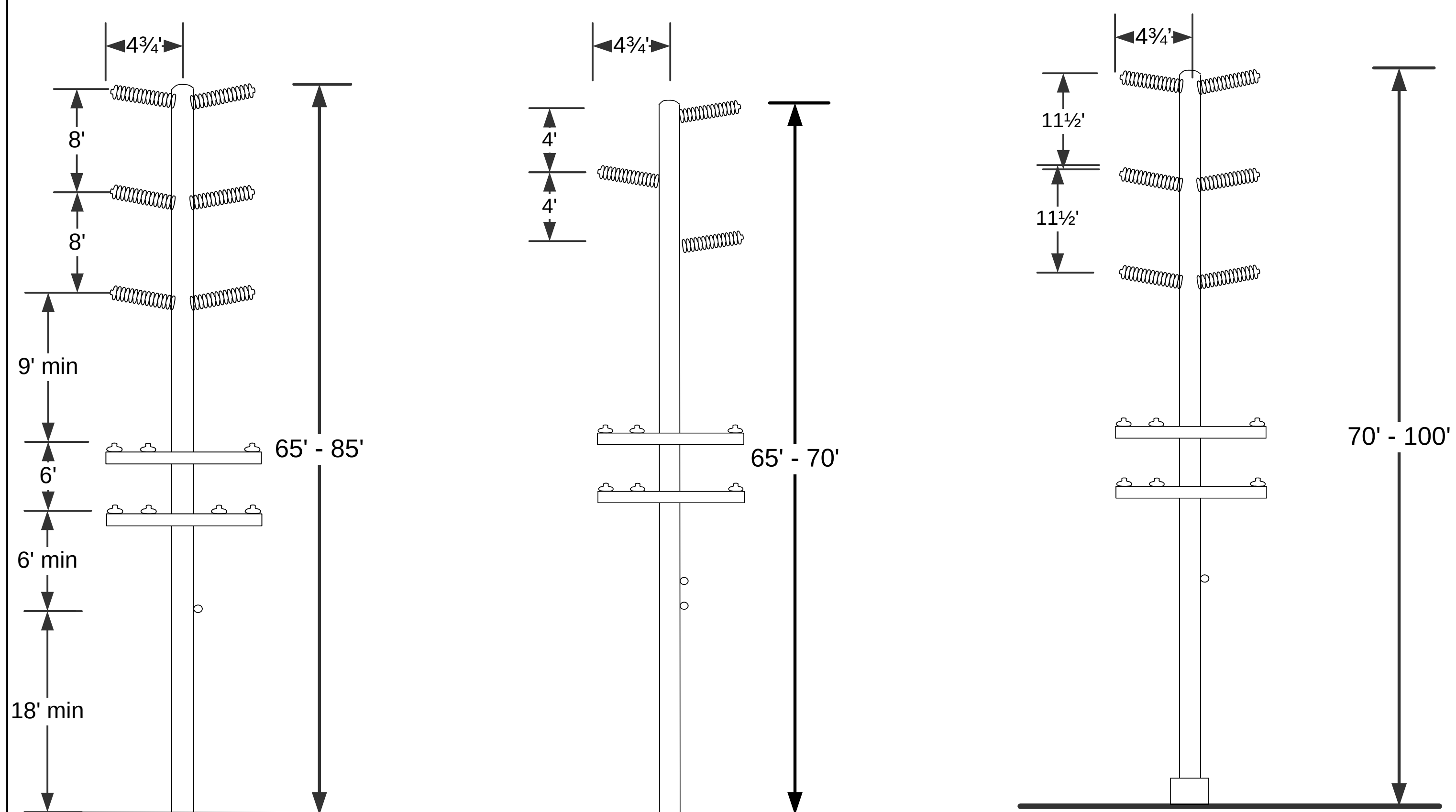
Figure 3.4a

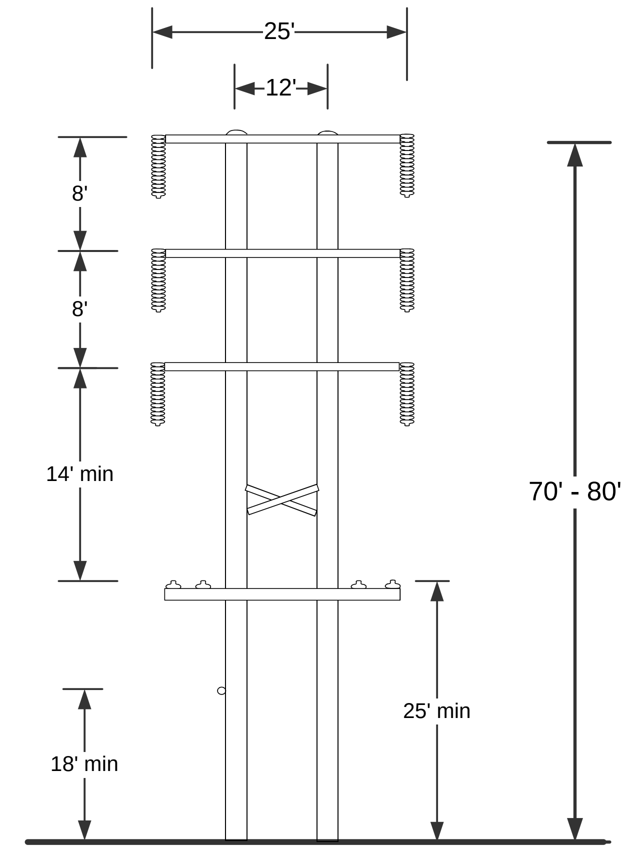
Typical 115 kV Subtransmission Structures



Lightweight Steel Pole (Double Circuit)

Lightweight Steel Pole (Single Circuit)

Tubular Steel Pole (Double Circuit)



H-Frame (Double Circuit)

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The double-circuiting of an existing single-circuit subtransmission line without structure replacement would begin at the Alberhill Substation and follow Concordia Ranch Road to its terminus, cross the I-15 freeway to Temescal Canyon Road, to Lake Street. From that point, the line would be located within a proposed Castle & Cooke utility corridor that follows the present alignment of Lake Street to Coal Avenue. The line would then follow Coal Avenue to Nichols Road, then turn southeast on Baker Street Avenue to Riverside Avenue (State Route 74). The route crosses a drainage channel and continues southeast on Pasadena Avenue, then turns northeast on Third Street to the intersection of Third Street and Collier Avenue. However, the final route of this portion of the subtransmission modifications would be dependent on CPUC final approval of the Valley-Ivyglen line, expected in late 2009/early 2010.

3.1.3.2 Double-circuit an existing single-circuit 115 kV subtransmission line with structure replacement

Portions of four existing single-circuit 115 kV subtransmission lines would need to be removed and new structures capable of supporting a double-circuit subtransmission line would need to be installed.

Valley-Elsinore-Ivyglen 115 kV Subtransmission Line

An approximate 0.3 mile section of the existing Valley-Elsinore-Ivyglen 115 kV subtransmission line in the City of Lake Elsinore between the intersection of Third Street and Collier Avenue and the intersection of Second Street and Camino del Norte, would require new structures to support a second circuit. This section would rebuild an existing crossing of the I-15 freeway, and require the removal of approximately 12 existing structures and the installation of approximately 11 new LWS poles and three TSPs.

Ivyglen-Newcomb-Skylark and Elsinore-Skylark 115 kV Subtransmission Lines

Approximately 4.5 miles of existing 115 kV subtransmission lines in the cities of Lake Elsinore and Wildomar between the intersection of East Hill Street and Flint Street and Skylark Substation would require new structures to support a second circuit. Three poles paralleling East Hill Street on the former and idle Ivyglen-Newcomb-Skylark 115 kV subtransmission line would be replaced, and approximately 104 poles of the existing Elsinore-Skylark 115 kV subtransmission line along Franklin Street, Auto Center Drive, Casino Drive, Malaga Road, and Mission Trail to Skylark Substation would be replaced. This section would require removal of approximately 106 existing structures and the installation of approximately 91 new LWS poles and approximately 15 new TSPs.

Valley-Newcomb-Skylark 115 kV Subtransmission Line

An approximate 5.5 mile section of the existing Valley-Newcomb-Skylark 115 kV subtransmission line between Skylark Substation and the intersection of Scott Road and Murrieta Road in the cities of Wildomar and Menifee would require new structures to support a second circuit. From Skylark Substation, this section of line follows Waite Street, turns north on Almond Street, turns east on Lemon Street, and crosses the I-15 freeway. The line then follows Lost Road, and generally follows Crab Hollow Circle to Beverly Street, where it then follows Bundy Canyon Road and Scott Road to the intersection of Scott Road and Murrieta Road. This section would require the removal of approximately 127 existing structures and installation of approximately 116 new LWS poles, four new TSPs, and 10 new H-frame structures.

There is a second section of the Valley-Newcomb-Skylark 115 kV subtransmission line in the City of Menifee that would be modified as part of the project. An approximate 0.2 mile section of the existing Valley-Newcomb-Skylark 115 kV subtransmission line between Newcomb Substation and the intersection of Newport Road and Murrieta Road would need to be replaced with structures capable of supporting a double circuit. This section would require the removal of approximately five existing structures and installation of approximately five new LWS poles and approximately two new TSPs.

New Poles at Existing I-15 Freeway Crossing and Line Separation at 500 kV Crossing

Two existing 115 kV subtransmission poles would be replaced at the existing I-15 freeway crossing immediately south of the Alberhill Substation site. This area is shown on Figure 3.3a, 115 kV Subtransmission Line Description.

The existing Valley-Newcomb 115 kV subtransmission line would be physically and electrically separated by disconnecting existing jumper loop wires at the 500 kV crossing. This is also shown on Figure 3.3a, 115 kV Subtransmission Line Description.

3.1.3.3 New 115 kV Subtransmission Lines

A distribution line approximately 3 miles long between the intersection of Newport Road and Murrieta Road and Murrieta Road and Bundy Canyon Road would be rebuilt as a single-circuit 115 kV subtransmission line and the existing distribution line would be transferred to the new 115 kV structures below the 115 kV circuit. This section would require the removal of approximately 66 existing poles and installation of approximately 78 new LWS poles.

Approximately 11 new TSPs would be installed at the Alberhill Substation site and Concordia Ranch Road to facilitate the 115 kV subtransmission connection from the Alberhill Substation to existing 115 kV subtransmission lines along Concordia Ranch Road.

In addition, a connection between the Valley-Ivyglen 115 kV subtransmission line on the north side of the Serrano-Valley 500 kV corridor and the Valley-Newcomb 115 kV subtransmission line located on the south side of the corridor, would be made. This section is approximately 300 feet long and would require removal of approximately one existing structure, and installation of approximately three LWS poles and three TSPs. An access road would also be installed. This area is shown on Figure 3.3a, 115 kV Subtransmission Line Description.

3.1.4 Telecommunications Improvements

The proposed Alberhill Substation requires the installation of new telecommunication infrastructure to protect the transmission and subtransmission lines and provide protective relaying, data transmission, and telephone services to the substations served by the Alberhill 115 kV System. These new facilities include modifications to the existing SCE microwave system and the addition of new fiber optic cable.

3.1.4.1 Microwave System

To connect the Alberhill Substation to SCE's microwave communications system, a 120-foot tall antenna tower would be built at Alberhill Substation to provide a line of sight with an antenna tower at Santiago Peak Communications Site, approximately 7 miles to the southwest.

In total, three new microwave dish antennas would be installed on existing tower structures: two at Santiago Peak Communications Site (one directed at the Alberhill Substation, and one directed at Serrano Substation), and one microwave dish antenna would be installed at Serrano Substation and directed at the Santiago Peak Communications Site. Typical microwave dish antennas are approximately 10 feet in diameter.

New microwave radios and new channel equipment would also be installed inside the existing telecommunications control room at Santiago Peak, Serrano Substation, and the new telecommunications control room to be installed at Alberhill Substation.

3.1.4.2 Fiber Optic Cable

Alberhill Substation would be connected to an existing fiber optic system serving Valley, Mira Loma, and Serrano Substations. In addition, the five 115/12 kV substations that would be transferred to the new Alberhill System would be connected by new and existing fiber optic cable, and new telecommunications equipment would be installed within the telecommunications rooms at Serrano, Barre, Walnut, Mira Loma, Valley, Ivyglen, Fogarty, Newcomb, Tenaja, and Skylark Substations to facilitate the new connections. In addition to each segment of the 500 kV transmission line segments carrying OPGW, approximately 8.5 miles of overhead cable would be installed on 115 kV structures installed as part of the ~~Proposed Project~~Original ASP. This distance and location are subject to change as the surrounding area develops and space on or within existing facilities is put to use by other utilities, and new facilities become available for SCE's use. The preliminary areas of fiber optic installation are shown in Appendix E, Telecommunications Improvements.

3.2 ~~PROPOSED PROJECT~~ORIGINAL ASP CONSTRUCTION PLAN

The ~~Proposed Project~~Original ASP would include construction of the Alberhill Substation, two 500 kV transmission line segments, new and modified 115 kV subtransmission lines, and telecommunications improvements. Construction would also include construction support activities, such as establishing material staging yards, and the development of access roads and spur roads. The following sections provide more detailed information on the tasks that would be associated with construction of the ~~Proposed Project~~Original ASP.

3.2.1.1 Storm Water Pollution Prevention Plan

Because construction of the ~~Proposed Project~~Original ASP would disturb a surface area greater than one acre, SCE would be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. The State Water Resources Control Board may require either the Santa Ana Regional Water Quality Control Board (SARWQCB) or the San Diego Regional Water Quality Control Board (SDRWQCB) to monitor adherence to permit conditions. To acquire the permit, SCE would prepare a Storm Water Pollution Prevention Plan (SWPPP) that includes project information; monitoring and reporting procedures; and Best Management Practices

(BMPs), such as dewatering procedures, storm water runoff quality control measures, and concrete waste management, as necessary. The SWPPP would be based on final engineering design and would include all project components.

3.2.1.2 Dust Control

The construction activities would occur in the South Coast Air Quality Management District (SCAQMD) and would be subject to SCAQMD Rule 403. This rule minimizes emissions of fugitive dust by requiring persons to take action to prevent, reduce or mitigate fugitive dust emissions by utilizing one or more applicable best available control measures. These measures include actions such as the application of water or chemical stabilizers to disturbed soil.

3.2.1.3 Marshalling Yards and Material Staging Yards

Temporary marshalling yards would be used to stage equipment and materials during construction. Materials and equipment typically staged at these marshalling yards would include, but would not be limited to, construction trailers, construction equipment, steel, conductor, wire reels, cable, hardware, insulators, signage, fuel, joint compound, and other consumable materials. The ~~Proposed Project~~Original ASP would utilize the Alberhill Substation site as a primary marshalling yard, but may use additional yards as needed. Preparation of the marshalling yard may include the application of gravel and the installation of perimeter fencing.

The marshalling yard would be used as a reporting location for workers, and for vehicle and equipment parking and material storage. The yard would have offices for supervisory and clerical personnel. Normal maintenance of construction equipment would be conducted at the marshalling yard. The maximum number of workers reporting to the marshalling yard is not expected to exceed approximately 100 workers at any one time.

In addition to the primary marshalling yard, temporary secondary material staging yards would be established for short-term utilization near construction sites. Where possible, the secondary staging yards would be sited in areas of previous disturbance near the construction areas. Final siting of these yards would depend upon availability of appropriately zoned property that is suitable for this purpose. The number and size of the secondary yards would be dependent upon a detailed field inspection and would take into account, where practical, suggestions by the successful bidder for the construction work. Typically, an area approximately 1 to 3 acres would be required. Once sites for secondary yards are proposed, an environmental review would be conducted before final site selection. Preparation of the secondary staging yards would include installation of perimeter fencing. The application of road base may also occur, depending on existing ground conditions at the yard site. Land disturbed at the temporary material staging areas, if any, would be restored to preconstruction conditions or to a condition agreed upon between SCE and the landowner following the completion of construction of the ~~Proposed Project~~Original ASP.

All materials associated with construction efforts would be delivered by truck to an established marshalling or material staging yard. Delivery activities requiring major street use would be scheduled to occur during off-peak traffic hours to the extent feasible in accordance with applicable local ordinances.

If necessary, SCE would hire a local security company to provide 24-hour attendance at the marshalling yard or material staging yards during construction.

3.2.1.4 Concrete Use

During construction, existing concrete supply facilities would be used where feasible. If concrete supply facilities are not available, a temporary concrete batch plant would be set up. If necessary, approximately 2 acres of property would be partitioned from an established marshalling yard or material staging yard for a temporary concrete batch plant. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

3.2.1.5 Traffic Control

Construction activities completed within public street rights-of-way would require the use of a traffic control service and all lane closures would be conducted in accordance with local ordinances and city permit conditions. These traffic control measures are typically consistent with those published in the California Joint Utility Traffic Control Manual (April, 2010).

3.2.1.6 Identification of Underground Utilities During Construction

Prior to drilling boreholes for foundations or for direct bury of LWS poles, SCE or its contractor would contact Underground Service Alert to identify any underground utilities in the construction area. If other utilities are located in the construction area, SCE would contact the owner of such utility to discuss protection or relocation of such utility.

3.2.1.7 Nighttime Construction

Under normal circumstances, construction of the ~~Proposed Project~~Original ASP would occur during daylight hours. However, there is a possibility that construction would occur at night, and temporary artificial illumination would be required. SCE would use lighting to protect the safety of the construction workers, but orient the lights to minimize their effect on any nearby receptors.

3.2.2 Alberhill Substation Construction

The following sections describe the construction activities associated with installing the components of the proposed Alberhill Substation.

The substation site would be prepared by clearing existing vegetation and installing a temporary chain link fence to surround the construction site. The site would be graded in accordance with a grading plan developed in consultation with Riverside County. The area to be enclosed by the perimeter wall would be graded to a slope that varies between one and two percent and compacted to 90 percent of the maximum dry density. The areas outside the substation wall that would be used as a buffer would be graded in a manner consistent with the overall site drainage design as described in Section 3.1.1.10, Substation Drainage.

After the substation site is graded, below grade facilities would be installed. Below grade facilities include a ground grid, trenches, building foundations, equipment foundations, utilities, and the base of the substation wall. The design of the ground grid would be based on soil resistivity measurements collected during a geotechnical investigation that would be conducted prior to construction (as described in Section 3.5, Geotechnical Studies). Above grade installation of substation facilities (i.e. buses, capacitors, circuit breakers, transformers, steel support structures, and the control building) would commence after the below grade structures are in place.

The transformers would be delivered by heavy-transport vehicles and off-loaded on site by large cranes with support trucks. A traffic control service may be used for transformer delivery, if necessary.

3.2.3 500 kV Transmission Line Segment Construction

The following sections describe the construction activities associated with the construction of the 500 kV transmission line segments.

3.2.3.1 Access Roads and Spur Roads

Transmission line roads are classified into two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along transmission line ROWs. Spur roads are roads that lead from line access roads and terminate at one or more of the structure sites. It is anticipated that most of the roads constructed to accommodate construction of the ~~Proposed Project~~Original ASP would be left in place to facilitate future access for operations and maintenance purposes. Gates would be installed where required at fenced property lines to restrict general and recreational vehicular access to ROW roads.

All access roads and spur roads (new and existing) would first be cleared and grubbed of vegetation. Roads would be blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet (preferably with 2 feet of shoulder on each side), but may be wider depending on final field conditions.

In addition, drainage structures (e.g., wet crossings, water bars, overside drains, pipe culverts, and energy dissipaters) may be installed along roads to protect the road from the effects of uncontrolled water flow. Slides, washouts, and other slope failures would be repaired and stabilized along the roads by installing retaining walls or other means necessary to prevent future failures. The type of drainage structure or earth-retaining structure to be used would be based on site-specific conditions and final engineering of the ~~Proposed Project~~Original ASP.

Existing and new access roads and spur roads for the ~~Proposed Project~~Original ASP are shown in Appendix D, Proposed Project Road Story.

3.2.3.2 500 kV Tower Site Preparation

The new tower pad locations would first be graded and/or cleared to provide a reasonably level and vegetation-free surface for footing construction. Sites would be graded such that water would run toward the direction of the natural drainage and prevent ponding and erosive water flows that could cause damage to the tower footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

Each tower site would typically require a laydown area of approximately 200 feet by 200 feet. In locations where the terrain in the laydown area is already reasonably level, only vegetation removal would occur to prepare the site for construction. In locations where a level surface is not present both vegetation clearing and grading would be necessary to prepare the laydown area for construction.

Tower installation may also require establishment of a temporary crane pad to allow an erection crane to set up 60 feet from the centerline of each structure. The crane pad would be located transversely from each applicable structure location. In most cases, this crane pad would be located within the laydown area used for structure assembly. If a separate pad is required, it would occupy an area of approximately 50 feet by 50 feet. The decision to use a separate crane pad would be determined by the final engineering for the ~~Proposed Project~~Original ASP and the selection of the appropriate construction methods to be used by SCE or its contractor.

In mountainous areas, benching may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. Benching is a technique in which a tracked earth-moving vehicle excavates a terraced access to excavation areas in extremely steep and rugged terrain. Benching would be used on an as-needed basis in areas to help ensure the safety of personnel during construction activities, and to control costs in situations where potentially hazardous, manual excavations would be required.

Where there would be a structure located in terrain inaccessible by a crane, it is anticipated that a helicopter may be used for the installation of the structure. The final decision on helicopter use would be made by SCE and the construction contractor. The use of helicopters for the erection of structures would be in accordance with SCE specifications and would be similar to methods detailed in IEEE 951-1996, Guide to the Assembly and Erection of Metal Transmission Structures, Section 9, Helicopter Methods of Construction. Helicopter use for the ~~Proposed Project~~Original ASP is explained in more detail in Section 3.2.3.5, Wire Stringing Operations.

3.2.3.3 Tower Foundations

Structure foundations for the towers would typically be drilled concrete piers. Each tower would be constructed on four drilled concrete foundations. The foundation process would start with the auguring of the holes for each tower. The holes would be bored using truck or track-mounted excavators with various diameter augers to match diameter requirements of the foundation sizes.

Foundations in soft or loose soil that extend below the groundwater level may require the borehole be stabilized with mud slurry during drilling. If this is the case, a mud slurry would be mixed and pumped into the borehole after drilling to prevent the sidewalls from sloughing. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry.

The mud slurry that is brought to the surface is typically collected in a pit adjacent to the foundation, and then pumped out of the pit to be reused or discarded at an off-site disposal facility in accordance with all applicable laws.

Following excavation for the foundation, reinforcing steel, and stub angles would be installed and the concrete would then be placed. Steel reinforced cages and stub angles would be assembled at laydown yards and delivered to each structure location by flatbed truck. A typical tower would require 25 to 100 cubic yards of concrete delivered to each structure location. Concrete samples would be drawn at time of pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of steel.

Conventional construction techniques would generally be used as described above for new footing installation. In certain cases, equipment and material may be deposited at structure sites using helicopters or by workers on foot, and crews may prepare the footings using hand labor assisted by hydraulic or pneumatic equipment, or other methods.

3.2.3.4 Tower Assembly

Each tower would be assembled at laydown areas at its location, and then erected and bolted to the foundations. Tower assembly would begin with hauling and stacking bundles of steel at tower location per engineering drawing requirements. This activity requires use of several tractors with 40-foot trailers and a rough terrain forklift. After steel is delivered and stacked, crews would proceed with the assembly of leg extensions, body panels, boxed sections and the bridges. The assembled tower sections would be lifted into place with a minimum 80-ton all-terrain or rough terrain crane. The steel work would be completed by a combined erection and torquing crew with a lattice boom crane. The construction crew may opt to install insulators and wire rollers (travelers) for the conductor installation at this time.

3.2.3.5 Wire Stringing Operations

Wire-stringing includes all activities associated with the installation of conductors onto the structure. This activity includes the installation of primary conductor and OPGW or ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to process methods detailed in IEEE Standard 524- 2003, Guide to the Installation of Overhead Transmission Line Conductors. A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Typically, wire pulls occur every 15,000 to 18,000 feet on flat terrain or less in rugged terrain. Wire splices typically occur every 7,500 to 9,000 feet on flat terrain or less in rugged terrain. Wire pulls are selected, where possible, based on availability of dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

The following four steps describe the wire installation activities proposed by SCE:

- Sock Line Threading: A helicopter would fly a lightweight sock line from tower to tower, which would be threaded through the wire rollers in order to engage a cam-lock device that would secure the pulling sock in the roller. This threading process would continue between all towers through the rollers of a particular set of spans selected for a conductor pull.

- Pulling: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware known as a running board would be installed to properly feed the conductor into the roller; this device keeps the conductor from wrapping during installation.

- Splicing, Sagging, and Dead-ending: After the conductor is pulled in, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.

- Clipping-in: After conductor is dead-ended, the conductors would be attached to all structures; a process called clipping in.

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depend upon terrain. The preferred minimum size needed for tensioning equipment set-up sites requires an area of 500 feet by 150 feet, the preferred minimum size needed for pulling equipment set-up sites requires an area of 300 feet by 150 feet, the preferred minimum size needed for splicing equipment set-up sites requires an area 150 feet by 100 feet; however, crews can work from within slightly smaller areas when space is limited. Each stringing operation would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end. Splicing sites would be strategically located to support the stringing operations; splicing sites include specialized support equipment such as skidders and wire crimping equipment.

The puller, tensioner, and splicing set-up locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each tower, and are necessary as the permanent splices that join the conductor together cannot travel through the rollers. For stringing equipment that cannot be positioned at either side of a dead-end transmission tower, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The puller, tensioner, and splicing set-up locations require level areas to allow for equipment maneuvering. When possible, these locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup. These temporary wire stringing areas would be restored to previous conditions following completion of pulling and splicing activities. The number and locations of the puller, tensioner, and splicing sites will be determined by the final engineering for the ~~Proposed Project~~Original ASP and the construction methods chosen by SCE or its contractor.

An OHGW would be installed on the transmission towers for shielding. The OHGW would be installed in the same manner as the conductor; it is typically installed in continuous segments of 11,000 feet or less, depending upon various factors including line direction, inclination, and accessibility.

3.2.3.6 Helicopter Use

The operations area of the small helicopter utilized during the sock line threading would be limited to helicopter staging areas, such as Skylark Field, and positions that are considered safe locations for landing. Final siting of staging areas for helicopter use would be conducted with the input of the helicopter contractor and local agencies. Helicopter fueling would occur at staging areas or at a local airport (e.g., Skylark Field) using either the helicopter contractor's fuel truck or the fuel service available at the airport. The helicopter and fuel truck may stay overnight at a local airport or at a staging area if adequate security is in place.

3.2.4 115 kV Subtransmission Line Construction

The following sections describe the construction activities associated with the 115 kV subtransmission line.

3.2.4.1 Airstrip

Construction of the modified 115 kV subtransmission lines for the ~~Proposed Project~~Original ASP would occur within 1,200 feet of a private airstrip (Skylark Field) near the south side of Lake Elsinore that is primarily used for skydiving. SCE would provide a construction schedule to the operator of Skylark Field prior to construction of the 115 kV subtransmission modifications near Skylark Substation, including the construction that would occur on Mission Trail, Waite Street, Lemon Street, Lost Road, and Beverly Street.

3.2.4.2 Site Preparation and Grading

The new LWS pole and TSP locations would first be graded and/or cleared to provide a reasonably level and vegetation-free surface for footing construction. An approximate 150 by 75 foot area around each 115 kV LWS pole and an approximate 200 by 100 foot area around each 115 kV TSP would be cleared of vegetation to provide a safe working area during construction. Any steel poles that are replacing existing wood poles would be installed as close as possible to the original structure and would require new excavations to set the poles. Depending on their location, the assembly and erection of some of the new TSPs may require that a new crane pad, approximately 50 feet by 50 feet, be prepared to allow an erection crane to set up 60 feet from the centerline of each TSP. The crane pad would be located transversely from each applicable TSP location.

Assembly of LWS and TSP poles typically would require a laydown area of approximately 200 feet by 100 feet. In locations where the terrain in the laydown area is already reasonably level, only vegetation removal would occur to prepare the site for construction. In locations where a level surface is not present, both vegetation clearing and grading would be necessary to prepare the laydown area for construction.

3.2.4.3 Light Weight Steel Pole Installation

LWS poles would be installed in the native soil in holes bored approximately 2 to 3 feet in diameter and 7 to 10 feet deep. LWS poles are normally shipped in sections with slip joints to the lay-down yard and then jacked together at the new pole location. LWS poles are normally installed using a line truck. Once the LWS poles are set in place, bore spoils (material from holes drilled) would be used to backfill the hole. If the bore spoils are not suitable for backfill, imported clean fill material, such as clean dirt and/or base material, would be used. Excess bore spoils would be distributed at each pole site and used as backfill for the holes left after removal of existing structures, or disposed of off-site in accordance with all applicable laws.

3.2.4.4 Tubular Steel Pole Installation

Structure foundations for the TSPs would typically be drilled concrete piers. The TSPs would be installed on top of cylindrical concrete foundations approximately 5 to 8 feet in diameter and approximately 20 to 40 feet deep (approximately 35 cubic yards would be removed) and is similar in method to that described above for the installation of 500 kV transmission tower foundations. A crane would be used to position each pole base section onto the foundation. When the base section is secured, the top section would be placed above the base section. The two sections would be bolted together and may be spot welded together for additional stability.

3.2.4.5 Subtransmission Wire Stringing Activities and Guard Structures

Conductor would be installed on the LWS poles and TSPs as similarly described above for the 500 kV transmission wire stringing activities, except that a line truck would drive from location to location to string the sock line, rather than use a helicopter.

Guard structures may be installed at transportation, flood control, and utility crossings. Guard structures are temporary facilities designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. Temporary netting could be installed to protect some types of under-built infrastructure. Typical guard structures are standard wood poles, 60 to 80 feet tall, and depending on the width of the conductor being constructed, the number of guard poles installed on either side of a crossing would be between two and four. The guard structures are removed after the conductor is secured into place. In some cases, the wood poles could be substituted with the use of specifically equipped boom-type trucks with heavy outriggers staged to prevent the conductor from dropping. Approximately 104 guard structures would be used for installing the 115 kV subtransmission lines.

Public agencies differ on their policies for preferred methods to protect public safety during conductor stringing operations. For highway and open channel aqueduct crossings, SCE would work with the applicable agency to secure the necessary permits to string conductor across the applicable infrastructure. For major roadway crossings, typically one of the following four methods is employed to protect the public:

- Erection of a highway net guard structure system;
- Detour of all traffic off a highway at the crossing position;

- Implementation of a controlled continuous traffic break while stringing operations are performed; or
- Strategic placement of special line trucks with extension booms on the highway deck.

Some agencies may require the use of a secondary safety take out sling at highway crossings.

3.2.4.6 Removal of Existing Subtransmission Structures

After the existing subtransmission, distribution lines, and telecommunication lines are transferred (where applicable) to the new subtransmission poles, the existing structures would be completely removed (including the below-ground portion) and the hole would be backfilled using imported fill in combination with fill that may be available as a result of excavation for the installation of the new steel poles. Depending on their condition and original chemical treatment, any wood poles removed may be reused by SCE, returned to the manufacturer, disposed of in a Class I hazardous waste landfill, or disposed of in the lined portion of a Regional Water Quality Control Board (RWQCB)-certified municipal landfill.

3.2.5 Energizing the Constructed 500 kV Transmission and 115 kV Subtransmission Lines

The final step in completing construction of the 500 kV transmission line segments and new and modified 115 kV subtransmission lines involves energizing the new conductor. To accomplish this, the existing lines in service would be de-energized, and the connections between the new and modified lines made. De-energizing and connecting the new lines to the existing system would typically occur when electrical demand is low, in order to reduce the need for electric service outages. Once the connection is complete, the existing lines would be returned to service and the new facilities would be energized.

3.2.6 Telecommunications Construction

The following sections provide detail on the construction activities associated with the telecommunications improvements.

3.2.6.1 Microwave System Construction

A 120-foot microwave tower would be installed at Alberhill Substation. All tower material would be delivered by truck and would be staged within a lay down area at the substation site. After the tower foundation is installed, each tower section would be assembled on site and erected using a 120-foot crane and a 120-foot lifting (bucket) truck.

The microwave dish antennas at Alberhill Substation, Santiago Peak, and Serrano Substation would be installed on the towers using a bucket truck.

3.2.6.2 Fiber Optic System Construction

The fiber optic system construction would include the installation of overhead facilities, underground facilities, and new telecommunications equipment at Serrano, Barre, Walnut, Mira Loma, Valley, Ivyglen, Fogarty, Newcomb, Tenaja, and Skylark Substations. The overhead telecommunications cable would be installed by attaching cable to structures in a manner similar to that described above for subtransmission wire stringing.

3.2.7 Post Construction Cleanup

SCE would restore all areas that were temporarily disturbed by construction of the ~~Proposed Project~~Original ASP (including temporary material staging yards, and conductor pull/tension/splicing sites) to as close to preconstruction conditions as possible, or to the conditions agreed upon between the landowner and SCE following the completion of construction of the ~~Proposed Project~~Original ASP. Any damage to existing roads as a result of construction would be repaired once construction is complete in accordance with local requirements.

In addition, all construction materials and debris would be removed from the area and recycled or properly disposed of off-site. SCE would conduct a final inspection to ensure that cleanup activities were successfully completed.

3.3 LAND ACQUISITION

SCE is in the process of acquiring approximately 124 acres of land for use as the Alberhill Substation site, approximately 24 acres of which would be within the substation wall. Approximately 4 acres of land immediately outside the substation perimeter wall to the west, east and south would be used for subtransmission and transmission line access, vehicular access, buffers, and landscaping. Approximately six acres located to the outside of the north substation wall, plus the north-east and north-east corners would be primarily dedicated to the control of stormwater run-off. The remaining approximately 90 acres of the property is either excess land that is not needed, or is comprised of steep hills that is not suitable for development.

Each 500 kV transmission line segment, originating at the Alberhill Substation and extending to the Serrano-Valley 500 kV transmission line, would require a 200 foot wide ROW. Approximately 12 acres of these ROWs would be on the substation parcel acquired for Alberhill Substation, and approximately 99 acres of ROWs would be acquired from four private property owners and a parcel owned by Riverside County (for which SCE would acquire a permit to cross).

3.4 LAND DISTURBANCE

Land disturbance would include the ground surface modifications at the substation site, the installation of the 500 kV transmission line segments and access roads, and the installation of the 115 kV subtransmission line structures. The portions of the ~~Proposed Project~~Original ASP construction that occurs along existing roads in the franchise position is summarized in Table 3.3, Summary of Land Disturbance Within Public ROW. Land disturbance associated with portions of the ~~Proposed Project~~Original ASP that would be constructed in areas away from public streets are summarized in Table 3.4, Summary of Land Disturbance Outside of Public ROW. Rights-of-way acquisition requirements are discussed above in Section 3.3, Land Acquisition.

3.5 GEOTECHNICAL STUDIES

Prior to the start of construction, SCE would conduct a geotechnical study of the substation site and the 500 kV transmission line segments and the new and modified 115 kV subtransmission line routes that would include an evaluation of the depth to the water table, liquefaction potential, physical properties of subsurface soils, soil resistivity, slope stability, and the presence of hazardous materials. This information would be used to develop final engineering of the ~~Proposed Project~~Original ASP facilities.

3.6 HAZARDS AND HAZARDOUS MATERIALS

Construction and operation of the ~~Proposed Project~~Original ASP would require the limited use of hazardous materials, such as fuels, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with the applicable regulations. For all hazardous materials in use at the construction site, Material Safety Data Sheets would be made available to all site workers in case of emergency.

The SWPPP prepared for the ~~Proposed Project~~Original ASP would provide detail of locations where hazardous materials may be stored during construction, and the protective measures, notifications, and cleanup requirements for any accidental spills or other releases of hazardous materials that could occur.

3.7 WASTE MANAGEMENT

Construction of the ~~Proposed Project~~Original ASP would result in the generation of various waste materials that can be recycled and salvaged. These items would be gathered by construction crews and separated into roll-off boxes. Salvageable items (i.e., conductor, steel, and hardware) would be transported to the material staging yards, sorted, and baled, and then sold through available markets. Items that may be recycled include the steel from towers (i.e., towers, nuts, bolts, and washers), the conductor wire and the hardware (i.e., shackles, clevises, yoke plates, links, or other connectors used to support conductor).

Construction of the ~~Proposed Project~~Original ASP would also generate waste materials that cannot be reused or recycled (i.e., wood, soil, vegetation, and sanitation waste); local waste management facilities would be used for the disposal of these types of construction waste. The disposal of any hazardous waste would be done at an appropriately licensed facility.

Table 3.3 Summary of Land Disturbance Within Public ROW

Project Activity	Site Quantity	Disturbed Area	Acres Disturbed During Construction	Acres to be Restored	Acres Required
Guard Structures	100	50' x 75'	8.7	8.7	--
Remove Existing 115 kV TSP	7	200' x 100'	3.2	3.2	--
Remove Existing 115 kV LWS	2	50' x 50'	0.1	0.1	--
Remove Existing 115 kV Wood Pole	292	50' x 50'	16.8	16.8	--
Construct New 115 kV TSP	40	200' x 100'	18.4	16.0	2.4
Construct New 115 kV LWS	284	150' x 75'	73.3	59.1	14.2
115 kV Wire Stringing - Puller	16	200' x 100'	7.3	7.3	--
115 kV Wire Stringing - Tensioner	16	500' x 100'	18.4	18.4	--
115 kV Wire Stringing - Splicing	3	150' x 100'	1.0	1.0	--
New Roads (Access & Spur)	0.06	Linear miles x 14' wide	0.8	--	0.8
Subtotal: 115 kV Subtransmission Within Public ROW			**148**	**130**	**18**

Note: The disturbed acreage calculations are estimates based upon SCE's preferred area of use and the width of the proposed right-of-way for the described project feature; they are subject to revision based upon final engineering.

Table 3.4 Summary of Land Disturbance Outside of Public ROW

Project Activity	Site Quantity	Disturbed Area	Acres Disturbed During Construction	Acres to be Restored	Acres Required
Alberhill Substation	**1**	**--**	**34**	**--**	**34**
Remove Existing 500 kV Towers	2	150’ x 150’	1.0	1.0	--
Construct New 500 kV Towers	12	200’ x 200’	11.0	8.6	2.4
500 kV Wire Stringing - Puller	2	100’ x 50’	0.2	0.2	--
500 kV Field Snub Area	2	50’ x 50’	0.1	0.1	--
New Roads (Access & Spur)	--	See Note (1) below	11.1	--	11.1
Subtotal: 500 kV Transmission		**50’ x 75’**	**23**	**11**	**14**
Guard Structures	4	50’ x 75’	0.3	0.3	--
Remove Existing 115 kV Wood H-Frame	15	75’ x 50’	1.3	1.3	--
Remove Existing 115 kV Wood Pole	20	50’ x 50’	1.1	1.1	--
Construct New 115 kV LWS	20	150’ x 75’	5.2	4.2	1.0
Construct New 115 kV Wood H-Frame	10	100’ x 50’	1.1	0.4	0.7
115 kV Wire Stringing - Puller	1	200’ x 100’	0.5	0.5	--
115 kV Wire Stringing - Tensioner	1	500’ x 100’	1.1	1.1	--
115 kV Wire Stringing - Splicing	1	150’ x 100’	0.3	0.3	--
Subtotal: 115 kV Subtransmission			**11**	**9**	**2**
Total Outside Public ROW			**63**	**21**	**42**

Note: The disturbed acreage calculations are estimates based upon SCE’s preferred area of use and the width of the proposed right-of-way for the described project feature; they are subject to revision based upon final engineering.
(1) Disturbance acreages for the access roads was estimated using Civil 2008 in conjunction with AutoCAD software.

3.8 ENVIRONMENTAL SURVEYS

Prior to the start of construction, detailed environmental surveys would be conducted to identify sensitive biological and cultural resources in the vicinity of the ~~Proposed Project~~Original ASP. Where feasible, the information gathered from these surveys may be used to modify the project design in order to avoid sensitive resources, or to implement Applicant Proposed Measures (APMs) to minimize the impact to sensitive resources from project-related activities. The results of these surveys would also determine the extent to which environmental specialist construction monitors would be required.

The following focused biological resource surveys would be conducted during Spring 2011. More information on these sensitive species can be found in Section 4.4, Biological Resources.

- Focused plant surveys. Focused plant surveys would be conducted for narrow endemic plant and WRMSHCP criteria area plant species with the potential to occur within the vicinity of the ~~Proposed Project~~Original ASP. The special status plant surveys would follow guidelines developed by California Natural Plant Society (CNPS) to identify sensitive species that have the potential to be present in the area. If sensitive species are present, and avoidance is not feasible, consultation with the US Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) would be necessary to determine if a permit would be required to impact any one of these species, and SCE would propose APMs to minimize impacts.

- Jurisdictional Drainages and Riparian and Riverine Surveys. A wetland delineation would be conducted to describe and map the extent of resources under the jurisdiction of the US Army Corps of Engineers (USACE), the RWQCB, the CDFG, and/or the WRMSHCP following the guidelines presented in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region and other agency guidance documents. As appropriate, SCE would secure appropriate permits such as a Streambed Alteration Agreement from the CDFG, and Clean Water Act Section 404 and 401 permits from the USACE and State Water Resources Control Board, respectively, and/or a certificate of inclusion from the WRMSHCP.

- Burrowing owl. Focused burrowing owl surveys would be conducted in the areas affected by the ~~Proposed Project~~Original ASP following California Department of Fish and Game Guidelines. If burrowing owls are observed within the construction areas of the ~~Proposed Project~~Original ASP, CDFG Protocols would be implemented, and SCE would propose APMs to minimize impacts.

- Stephens' Kangaroo Rat and other small mammals. Focused surveys for Stephens' kangaroo rat and other small mammals with the potential to occur in the vicinity of the ~~Proposed Project~~Original ASP would be conducted during the appropriate time of year to detect the species. If Stephens' kangaroo rat or other small mammals listed by USFWS and/or CDFG are present and avoidance is not feasible, consultation with the USFWS and the CDFG would be necessary to determine if a permit would be required to impact any one of these species.

In addition, SCE would conduct the following surveys as the ~~Proposed Project~~Original ASP approaches final design:

- Paleontological Resource Survey. SCE would conduct a paleontological resource survey to identify sensitive paleontological resources in the areas potentially affected by the project. This information would be used to modify the design of the project, or develop a Paleontological Resources Recovery Plan, should it be necessary.

The following environmental surveys would occur prior to construction.

- Burrowing owl. The preconstruction surveys for burrowing owl would be conducted no more than 30 days prior to ground-disturbing activities. Potential burrows that are identified and determined to be unoccupied outside of the nesting season would be collapsed to avoid construction impacts to the species during nesting season. If burrowing owls are observed within the construction areas of the ~~Proposed Project~~Original ASP, CDFG Protocols would be implemented, and SCE would propose APMs to minimize impacts.

- Biological Resource Clearance Surveys. These surveys would identify all sensitive resources within a given work area within 10 days of any ground disturbing work. Should any special-status plants and/or wildlife species be located during this survey, appropriate measures would be implemented to avoid any impacts to special-status species (i.e., flag and avoid, utilization of construction fencing, biological monitor present during work, etc.). If avoidance cannot be maintained, consultation with appropriate agencies would occur.

- Active nests. The nesting season is generally February 15 to August 31. Work near nests would be scheduled to take place outside the nesting season when feasible. If a nest must be moved during the nesting season, SCE would coordinate with the CDFG and USFWS and obtain approval prior to moving the nest.

- Protected Trees. Prior to construction of the ~~Proposed Project~~Original ASP, SCE would determine if removal or alteration of trees protected by local ordinances would be required. If protected trees cannot be avoided, SCE would obtain the appropriate permits from the local agency prior to removing the tree.

3.9 WORKER ENVIRONMENTAL AWARENESS TRAINING

Prior to construction, a Worker Environmental Awareness Plan would be developed based on the final engineering design, the results of preconstruction surveys, and a list of mitigation measures, if any, developed by the CPUC to mitigate significant environmental effects of the ~~Proposed Project~~Original ASP. A presentation would be prepared by SCE and shown to all site workers prior to their start of work. A record of all trained personnel would be kept with the construction foreman.

In addition to the instruction for compliance with any site-specific biological or cultural resource protective measures and project mitigation measures, all construction personnel would also receive the following:

- A list of phone numbers of SCE personnel associated with the ~~Proposed Project~~Original ASP (archeologist, biologist, environmental compliance coordinator, and regional spill response coordinator)
- Instruction on the South Coast Air Quality Management District Rule 403 for control of dust
- Instruction on what typical cultural resources look like, and if discovered during construction, to suspend work in the vicinity of any find and contact the site foreman and archeologist or environmental compliance coordinator
- Instruction on washing the wheels, tracks, and underbodies of construction vehicles to minimize the spread of invasive species
- Instruction on individual responsibilities under the Clean Water Act, the project SWPPP, site-specific BMPs, and the location of Material Safety Data Sheets for the project
- Instructions to notify the foreman and regional spill response coordinator in case of hazardous materials spills and leaks from equipment, or upon the discovery of soil or groundwater contamination
- A copy of the truck routes to be used for material delivery ▪ Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the ~~Proposed Project~~Original ASP

3.10 CONSTRUCTION EQUIPMENT AND PERSONNEL

The estimated elements, equipment, and number of personnel required for construction of the ~~Proposed Project~~Original ASP are summarized in Appendix F, Construction Equipment and Personnel Requirements.

Construction would be performed by either SCE construction crews or contractors, depending on the availability of SCE construction personnel at the time of construction. If SCE transmission and telecommunications construction crews are used they would likely be based at one of SCE's local facilities such as the Valley Substation or the Wildomar Service Center. Contractor construction personnel would be managed by SCE construction management personnel.

In general, construction efforts would occur in accordance with accepted construction industry standards. Construction activities generally would be scheduled during daylight hours (e.g., 7:00 am to 7:00 pm), Monday through Saturday. When different hours or days are necessary, SCE would obtain variances, as necessary, from the jurisdiction in which the work would take place. All materials associated with construction efforts would be delivered by truck or helicopter to established marshalling yards. Delivery activities requiring major street use would be scheduled to occur during off-peak traffic hours.

3.11 CONSTRUCTION SCHEDULE

SCE anticipates that construction of the ~~Proposed Project~~Original ASP would take approximately 23 months. Construction would commence following CPUC approval, final engineering, and procurement activities. A preliminary construction schedule can be found in Table 3.5, Preliminary ~~Proposed Project~~Original ASP Construction Schedule. The ~~Proposed Project is~~Original ASP was originally scheduled to be in operation June 2014.

Table 3.5 Preliminary ~~Proposed Project~~Original ASP Construction Schedule

Activity	Duration
Substation Construction	23 months
Subtransmission Construction	12 months
Transmission Construction	12 months
Telecommunications	12 months
Testing	1 month

3.12 PROJECT OPERATION

Components of the Alberhill Substation Project would require routine maintenance, and may require emergency repair for service continuity. Alberhill Substation would be unstaffed, and electrical equipment within the substation would be remotely monitored and controlled by an automated system from SCE's Valley Substation Regional Control Center. SCE personnel would visit for electrical switching and routine maintenance purposes. Routine maintenance would include equipment testing, equipment monitoring, and repair. SCE personnel would generally visit the substation three to four times per month.

The new 500 kV transmission line segments and new and modified 115 kV subtransmission lines would be maintained in a manner consistent with CPUC General Order 165. SCE inspects transmission and subtransmission lines at least once per year by driving and/or flying the line routes, and the lines may otherwise occasionally require emergency repairs.

The telecommunications system would require routine maintenance, which would include equipment testing, monitoring, and repair. No additional SCE personnel, beyond normal staffing levels, would be required to operate or maintain the telecommunications system at the substations. Once per year, one individual would perform routine maintenance of the telecommunications components located at the substations.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT

This section examines the potential environmental impacts of the Original Alberhill System Project (~~Proposed Project~~ASP) prior to the inclusion of the design modification and engineering refinements) and the Alternative 115 Kilovolt (kV) Segment. The analysis of each resource category begins with an examination of the existing physical setting (baseline conditions as determined pursuant to Section 15125(a) of the California Environmental Quality Act [CEQA] Guidelines) that may be affected by the ~~Proposed Project.~~Original ASP. The effects of the ~~Proposed Project~~Original ASP are defined as changes to the environmental setting that are attributable to project construction and operation.

Significance criteria are identified for each environmental issue area. The significance criteria serve as a benchmark for determining if a project would result in a significant adverse environmental impact when evaluated against the baseline. According to the CEQA Guidelines Section 15382, a significant effect on the environment means "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project…" If significant impacts are identified, feasible Mitigation Measures are formulated to eliminate or reduce the level of the impacts and focus on the protection of sensitive resources.

CEQA Guidelines Section 15126.4(a)(3) states that mitigation measures are not required for effects which are not found to be significant. Therefore, where an impact is less than significant no mitigation measures have been proposed. In addition, compliance with laws, regulations, ordinances, and standards designed to reduce impacts to less than significant levels are not considered mitigation measures under CEQA. Where potentially adverse impacts may occur, Southern California Edison (SCE) has proposed Applicant Proposed Measures (APMs) to minimize the environmental impacts.

The Proponent's Environmental Assessment (PEA) concluded that impacts to air quality would be significant. The Final Environmental Impact Report (FEIR), dated April 2017, concluded there were Significant impacts to Aesthetics, Air Quality, and Noise and Vibration.[1] The FEIR also concluded there were Less than Significant impacts to Agriculture and Forestry Resources; Biological Resources; Cultural Resources; Geology, Soils, and Minerals; Greenhouse Gases~~;~~ (GHGs); Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Population and Housing; Public Services and Utilities; Recreation; and Transportation. The FEIR supersedes the PEA and based on the FEIR findings, SCE will comply with the Applicant-Proposed Measures and Mitigation Measures included in the certified FEIR.

To evaluate if the FEIR adequately contemplates the potential impacts associated with the Original ASP with the design modification and engineering refinements included (Proposed Project or ASP), SCE has included Appendix O: Revised Environmental Impact Analysis. This appendix provides redline/strikeout edits to the impact analysis from the FEIR to account for the Proposed Project's design as described in Appendix M: Revised Project Description and depicted in Appendix N: Project Design Comparison. The analysis also identifies and evaluates any

[1] The FEIR also determined there would be significant cumulative impacts to Aesthetics, Air Quality, and Biological Resources. It also determined there would be a potential for significant cumulative impacts to Cultural Resources if multiple projects were to impact the same known resource.

potential new impacts triggered by the changes to the Proposed Project's design that were not previously identified in the FEIR.

Three ~~new~~ system alternatives introduced during the second amendment to this PEA—San Diego Gas & Electric Company (SDG&E), Southern California Edison (SCE) Orange County, and Mira Loma—as described in Chapter 2, Project Alternatives, have been identified for further evaluation. The subsections that follow provide a comparison between the impacts associated with the Proposed Project as ~~determined by the FEIR~~described in Appendix O: Revised Environmental Impact Analysis and the impacts associated with each of the three new system alternatives. This analysis is intended to supplement, and not replace, the Chapter 4 ~~impact~~alternative analyses in the ~~September 20, 2009~~ second amendment to the PEA; therefore, the analysis associated with the ~~Proposed Project~~Original ASP and Alternative 115 kV Segment have not been replicated below.

SDG&E SYSTEM ALTERNATIVE

4.1 AESTHETICS

The SDG&E System Alternative is located in Riverside and San Diego counties, as well as within the City of Temecula and the community of Rainbow. The area is characterized by rolling hills and rural residential development. The new substation and portions of all transmission and subtransmission components of this system alternative would be located adjacent to the well-traveled California State Route (SR-) 79. This alternative's components would not represent a significant change in the existing visual quality as SCE currently owns and operates Pauba Substation, approximately 1.8 miles west of the proposed SDG&E System Alternative substation site, and overhead subtransmission line facilities in this area. The system alternative would also include the installation of approximately 6.4 miles of new double-circuit transmission line within undisturbed land in San Diego and Riverside counties. The grading of new, permanent access roads and pads to install and maintain the new facilities would result in permanent visual changes to this undeveloped landscape. While impacts to aesthetics would be significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would have greater aesthetic impacts than the Proposed Project because it involves the construction of more new transmission line, and associated permanent access roads and pads, within previously undeveloped areas.

4.2 AGRICULTURAL RESOURCES

Similar to the Proposed Project, the SDG&E System Alternative would not cross Unique Farmland~~,~~ or Williamson Act lands~~, or Farmland of Statewide Importance~~.[2] However, both the

[2] Prime Farmlands have the optimum combination of physical and chemical conditions that are able to sustain long-term agricultural production. The soil quality, growing season, and moisture supply on Prime Farmlands provide conditions to produce sustained high yields. Prime Farmlands must have been used for irrigated production within four years of the mapping date. Farmlands of Statewide Importance are similar to Prime Farmlands; however, these farmlands have minor shortcomings, such as a higher slope or decreased ability to store soil moisture. Similar to Prime Farmlands, Farmlands of Statewide Importance must have been used for irrigated production within four years of the mapping date. Unique Farmlands have lower-quality soils and are used for the production of

Proposed Project and the SDG&E System Alternative would cross Prime Farmland. The Proposed Project would temporarily impact approximately 0.71 acre and permanently impact approximately 0.04 acre of Prime Farmland. In addition, the Proposed Project would temporarily impact approximately 0.78 acre of Farmland of Statewide Importance. ~~the~~ The SDG&E System Alternative would require approximately 500 feet of new transmission line and approximately 370 feet of existing subtransmission line to be double-circuited within Prime Farmland. While impacts to agriculture would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would likely have greater agricultural impacts than the Proposed Project because it involves more construction within, and likely permanent impacts to, ~~Prime Farmland~~farmland.

4.3 AIR QUALITY

The SDG&E System Alternative would utilize similar construction methods, equipment, and crew sizes as the Proposed Project. As a result, the SDG&E System Alternative and the Proposed Project would result in similar daily criteria air pollutant emissions from the use of off-road equipment and on-road vehicles. The SDG&E System Alternative would require the installation of a new, double-circuit transmission line across approximately 6.4 miles of undisturbed, rugged terrain, while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading to establish access roads and permanent pads to operate and maintain these facilities. When compared to the Proposed Project, the increased grading associated with the SDG&E System Alternative ~~will~~ would result in increased fugitive dust emissions and more impacts to air quality during construction. The increased length of new transmission and subtransmission lines associated with the SDG&E System Alternative ~~will~~would lead to an increase in criteria air pollutants during ~~operation and maintenance~~O&M from heavy vehicle use. Fugitive dust emissions during ~~operation and maintenance~~O&M ~~will~~would also be higher than the Proposed Project due to the additional unpaved vehicle travel required to access the transmission facilities. While impacts to air quality would be significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would have greater air quality impacts than the Proposed Project because it involves more grading to establish permanent access to the transmission line and requires a larger increase in O&M activities over what SCE currently conducts in the area.

4.4 BIOLOGICAL RESOURCES

The Proposed Project and the SDG&E System Alternative would cross suitable habitat for multiple special-status species, sensitive natural habitats, wildlife migratory corridors, and jurisdictional water features. The SDG&E System Alternative would require the installation of a new, double-circuit transmission line across approximately 6.4 miles of undisturbed, rugged terrain, while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading and vegetation clearing to establish access roads and permanent pads to

California's leading agricultural products. Unique Farmlands are typically irrigated but may also include non-irrigated vineyards or orchards found in certain climatic zones. Unique Farmlands must have been cropped within four years of the mapping date.

install and maintain these facilities. The increased grading associated with the SDG&E System Alternative's transmission line construction ~~will~~would result in a greater disturbance to biological resources, including special-status species habitat and sensitive natural communities. These activities would also increase the potential for direct take of special-status species. The remainder of the SDG&E System Alternative would occur along existing roadways, similar to the Proposed Project. The substations associated with the SDG&E System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use. While impacts to biological resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would have greater biological resource impacts than the Proposed Project because it involves more construction in potentially sensitive habitat.

4.5 CULTURAL RESOURCES

The SDG&E System Alternative would require the installation of a new, double-circuit transmission line across approximately 6.4 miles of undisturbed, rugged terrain, while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading and vegetation clearing to establish access roads and permanent pads to install and maintain these facilities. The remainder of the SDG&E System Alternative would occur along existing roadways, similar to the Proposed Project. The substations associated with the SDG&E System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use.

The additional ground disturbance associated with the SDG&E System Alternative would increase the possibility of disturbing surface and subsurface cultural and paleontological resources. In addition, approximately 5 miles of the SDG&E System Alternative cross the Pechanga Reservation, resulting in the increased possibility of impacting a Traditional Cultural Property or Tribal Cultural Resource. While impacts to cultural resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would likely have greater cultural resource impacts than the Proposed Project because it involves more ground disturbance in previously undisturbed areas and construction within the Pechanga Reservation.

4.6 GEOLOGY AND SOILS

The SDG&E System Alternative would be located in a similar geologic setting to the Proposed Project and would involve the installation of similar structures. The new substation, portions of the transmission line, portions of the subtransmission lines, and the double-circuiting of existing subtransmission lines would be located within 1 mile of known earthquake faults. The SDG&E System Alternative, like the Proposed Project, is not located in the vicinity of historic landslides or on unstable geologic units. A ~~Stormwater Pollution Prevention Plan (~~SWPPP~~)~~ and proper engineering practices would be implemented for both the SDG&E System Alternative and the Proposed Project. As a result, the SDG&E System Alternative would have similar impacts to geology and soils as the Proposed Project. Based on the information SCE has analyzed, impacts to geology and soils would be less than significant.

4.7 HAZARDS AND HAZARDOUS MATERIALS

The majority of the SDG&E System Alternative (approximately 16.7 miles of transmission and subtransmission line and the new substation) would be constructed within a California Public Utilities Commission (CPUC) Tier 3 (i.e., extreme) fire threat area. Portions of the Proposed Project (approximately 12 miles of transmission and subtransmission line and the new Alberhill Substation) would also be constructed in high-fire-threat areas. Similar measures would be implemented for both the SDG&E System Alternative and the Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenance~~O&M. In order to evaluate the risk of wildfire, SCE utilized its Multi-Attribute Risk Score (MARS) model from the Risk Assessment and Mitigation Phase (RAMP) proceeding to determine the relative contribution that each of the system alternatives would make to increase the overall wildfire risk profile of SCE's system. The SDG&E System Alternative and the Proposed Project would result in similar increases to the wildfire risk profile if implemented. Similar to the Proposed Project, measures would be implemented for the SDG&E System Alternative to reduce the risk of transport, use, or disposal of hazardous materials and the release of hazardous materials, substances, or waste. Similar to the Proposed Project, off-road equipment and on-road vehicle use are anticipated to be the dominant noise sources during construction; therefore, noise from local airports would not pose a hazard for construction personnel. In addition, neither the SDG&E System Alternative nor the Proposed Project would involve construction on a site known to have hazardous waste or contamination. As a result, the SDG&E System Alternative would have similar impacts to hazards and hazardous materials when compared to the Proposed Project. Based on the information SCE has analyzed, impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.8 HYDROLOGY AND WATER QUALITY

The SDG&E System Alternative would be constructed using similar construction techniques to the Proposed Project; however, it would be located in an area that has more topographic variation and undeveloped areas than the Proposed Project. This topographic variation ~~will~~would result in a higher potential to affect water quality in the area due to the grading associated with the construction of new, permanent access roads and pads to install and maintain the transmission facilities. Further, the increased construction in undeveloped areas is likely to result in the direct impact of more jurisdictional water features when compared to the Proposed Project. Similar to the Proposed Project, the SDG&E System Alternative would implement measures to reduce the potential for impacts to water quality and changes in drainage patterns. Both the SDG&E System Alternative and Proposed Project would involve the construction of a new substation. These substations would be of similar size and introduce a similar amount of new impermeable surfaces. The installation of new overhead transmission and subtransmission facilities would result in minimal increases in impermeable surfaces; therefore, both would lead to similar levels of increased runoff. While impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would have greater hydrology and water quality impacts than the Proposed Project because it involves more grading in undeveloped areas and is likely to impact more jurisdictional water features.

4.9 LAND USE AND PLANNING

The SDG&E System Alternative would be located in unincorporated portions of San Diego and Riverside counties, the City of Temecula, and the community of Rainbow and would cross the Pechanga Reservation. Similar to the Proposed Project, the new substation would be constructed in a primarily undeveloped area; therefore, it would not divide an established community. In addition, the overhead transmission and subtransmission lines associated with the SDG&E System Alternative and Proposed Project would not impair movement or otherwise physically divide communities. Lastly, the SDG&E System Alternative and Proposed Project would participate in one or more Habitat Conservation Plans and/or Natural Community Conservation Plans. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the SDG&E System Alternative would have less-than-significant impacts on land use and planning with the implementation of applicant-proposed and/or mitigation measures.

4.10 MINERAL RESOURCES

The Proposed Project is partially located within an identified Mineral Resource Zone (MRZ)-3 zone and would result in the potential loss of exploration and utilization of potentially occurring mineral resources due to the installation of new facilities. The SDG&E System Alternative is not located within a known MRZ and therefore would not impact known mineral resources. As a result, and based on the information SCE has analyzed, there would be no impact; the SDG&E System Alternative would have less impact to mineral resources than the Proposed Project.

4.11 NOISE

The SDG&E System Alternative is located in an area characterized by rolling hills and rural residential development. The majority of the new transmission line construction would occur within undeveloped areas, while the majority of subtransmission line construction would occur along existing roadways, including SR-79. The SDG&E System Alternative and the Proposed Project would utilize similar construction techniques; therefore, noise levels during construction of the transmission and subtransmission lines would be similar. In addition, the ~~operation and maintenance~~O&M practices of (and therefore the noise from) these facilities would be similar for the SDG&E System Alternative and the Proposed Project. The new substation would be bounded by existing residences to the west, while Alberhill Substation would be surrounded by undeveloped uses. While impacts to noise would be significant with the implementation of applicant-proposed and/or mitigation measures, the SDG&E System Alternative would have greater noise impacts than the Proposed Project because the construction and ~~operation and maintenance~~O&M of the substation would be located in closer proximity to sensitive receptors.

4.12 POPULATION AND HOUSING

Similar to the Proposed Project, the SDG&E System Alternative would rely on a primarily local workforce and would not induce population growth. ~~Neither~~The proposed 500 kV transmission line right-of-way associated with the Proposed Project would overlap with one existing residence approximately 650 feet southwest of proposed Tower VA3. SCE intends to enter into an agreement with the landowner to purchase the property. As a result, neither the Proposed Project nor the SDG&E System Alternative would displace substantial numbers of existing housing units or people, and no new housing would need to be constructed. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the SDG&E System Alternative would have less-than-significant impacts on population and housing.

4.13 PUBLIC SERVICES

The majority of the SDG&E System Alternative (approximately 16.7 miles of transmission and subtransmission line and the new substation) would be constructed in CPUC Tier 3 (i.e., extreme) fire threat areas. Portions of the Proposed Project (approximately 12 miles of transmission and subtransmission line and the new Alberhill Substation) would also be constructed in high-fire-threat areas. Similar measures would be implemented for both the SDG&E System Alternative and the Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenanceand~~O&M and the measures would not require the expansion of fire protection services. In addition, the majority of the transmission line construction would occur off of public roadways, reducing the potential impact on government agency response times. Neither the SDG&E System Alternative nor the Proposed Project would be likely to require the use of law enforcement agencies, nor would either induce population growth requiring the construction of additional governmental or public facilities. As a result, similar to the Proposed Project and based on the information SCE has analyzed, impacts to public services would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.14 RECREATION

The SDG&E System Alternative is not anticipated to require the closure of any existing parks or other recreational facilities nor involve the construction or expansion of existing recreational facilities. If construction crews from the local workforce are not used, similar to the Proposed Project, there is the potential for an increase the use of recreational facilities. The Proposed Project would require the temporary closure of one existing park during conductor stringing. As a result, the SDG&E System Alternative would have less impacts to recreation than the Proposed Project. Based on the information SCE has analyzed, impacts from the SDG&E System Alternative would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.15 TRANSPORTATION AND TRAFFIC

The SDG&E System Alternative would involve construction of approximately 10.3 miles of transmission and subtransmission line along existing roadways, including SR-79. This is less than the 17.5 miles of subtransmission line construction along existing roadways associated with the Proposed Project. While the SDG&E System Alternative and Proposed Project are anticipated to use similar construction techniques, which would likely require temporary lane and/or road closures, the reduced length of construction along existing roadways is likely to result in less congestion during construction. Similar ~~operation and maintenanceactivities~~O&M activities would be utilized for the SDG&E System Alternative and the Proposed Project; therefore, these impacts would be similar. Similar to the Proposed Project, the SDG&E System Alternative is not anticipated to increase hazards, result in inadequate emergency access, result in inadequate parking, or conflict with alternative transportation. As a result, the SDG&E System

Alternative would have less impact on transportation and traffic than the Proposed Project. Based on the information SCE has analyzed, impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.16 UTILITIES AND SERVICE SYSTEMS

The SDG&E System Alternative and the Proposed Project would have similar grading requirements for substation construction. The Proposed Project and alternative would also have similar landfill, solid waste, and water treatment requirements. As a result, the SDG&E System Alternative would have similar impacts to utilities and service systems to the Proposed Project. Based on the information SCE has analyzed, impacts to utilities and service systems would be less than significant.

SCE ORANGE COUNTY SYSTEM ALTERNATIVE

4.1 AESTHETICS

The SCE Orange County System Alternative is located in Riverside, San Diego, and Orange counties within the cities of Murrieta, Wildomar, and San Clemente. The northeastern portion of this system alternative is characterized by urban development, while the remainder is characterized by undisturbed steep hills and terrain. The new subtransmission lines would be constructed mainly along city streets in urbanized areas and would not represent a significant change in visual quality. The new substation would be located in a rural residential area. The new transmission line would cross approximately 22.6 miles of undeveloped land in Riverside, San Diego, and Orange counties, including portions of the Cleveland National Forest (CNF), which is under the jurisdiction of the United States Forest Service, and the Santa Rosa Plateau Ecological Reserve, which is under the jurisdiction of the California Department of Fish and Wildlife. The transmission line would be visible from public vantage points, including recreational trails, within the CNF and reserve. The grading of new permanent access roads and pads to install and maintain the new facilities would result in permanent visual changes to this undeveloped landscape. While impacts to aesthetics would be significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater aesthetic impacts than the Proposed Project because it involves the construction of more new transmission line, and associated permanent access roads and pads, within previously undeveloped and recreational areas.

4.2 AGRICULTURAL RESOURCES

Similar to the Proposed Project, the Orange County System Alternative would not cross ~~Prime Farmland, Farmland of Statewide Importance, or~~ Williamson Act lands.[2] However, approximately 0.3 mile of new 220 kV transmission line would be constructed within areas designated as Unique Farmland~~.~~ compared to the approximately 0.71 acre of temporary impacts and 0.04 acre of permanent impacts to Prime Farmland and 0.78 acre of temporary impacts to Farmland of Statewide Importance associated with the Proposed Project. While impacts to agriculture would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would likely have greater agricultural impacts than the Proposed Project because it involves more construction within ~~Unique Farmland~~farmland.

4.3 AIR QUALITY

The SCE Orange County System Alternative would utilize similar construction methods, equipment, and crew sizes as the Proposed Project. As a result, the SCE Orange County System Alternative and the Proposed Project would result in similar daily criteria air pollutant emissions from the use of off-road equipment and on-road vehicles. The SCE Orange County System Alternative would require the installation of a new, double-circuit transmission line across approximately 22.6 miles of undisturbed, rugged terrain while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading to establish access roads and permanent pads to install and maintain these facilities. When compared to the Proposed Project, the increased grading associated with the SCE Orange County System Alternative ~~will~~would result in increased fugitive dust emissions and more impacts to air quality during construction. The increased length of new transmission and subtransmission lines associated with the SCE Orange County System Alternative ~~will~~would lead to an increase in criteria air pollutants during ~~operation and maintenance~~O&M from heavy vehicle use. Fugitive dust emissions during ~~operation and maintenance will~~O&M would also be higher than the Proposed Project due to the additional unpaved vehicle travel required to access the transmission facilities. While impacts to air quality would be significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater air quality impacts than the Proposed Project because it involves more grading to establish permanent access to the transmission line and requires a larger increase in ~~operation and maintenanceactivities~~O&M activities over what SCE currently conducts in the area.

4.4 BIOLOGICAL RESOURCES

The Proposed Project and the SCE Orange County System Alternative would cross suitable habitat for multiple special-status species, sensitive natural habitats, wildlife migratory corridors, and jurisdictional water features. The SCE Orange County System Alternative would require the installation of a new, double-circuit transmission line across approximately 22.6 miles of undisturbed, rugged terrain, while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading and vegetation clearing to establish access roads and permanent pads to operate and maintain these facilities. The increased grading associated with the SCE Orange County System Alternative's transmission line construction ~~will~~would result in a greater disturbance to biological resources, including special-status species habitat and sensitive natural communities. These activities would also increase the potential for direct take of special-status species. The remainder of the SCE Orange County System Alternative would occur along existing roadways, similar to the Proposed Project. The substations associated with the SCE Orange County System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use. While impacts to biological resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater biological resource impacts than the Proposed Project because it involves more construction in potentially sensitive habitat.

4.5 CULTURAL RESOURCES

The SCE Orange County System Alternative would require the installation of a new, double-circuit transmission line across approximately 22.6 miles of undisturbed, rugged terrain, while the Proposed Project would require approximately 3 miles of new single-circuit transmission line in similar conditions. Construction in this type of terrain would require significant grading and vegetation clearing to establish access roads and permanent pads to operate and maintain these facilities. The remainder of the SCE Orange County System Alternative would occur along existing roadways, similar to the Proposed Project. The substations associated with the SCE Orange County System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use.

The additional ground disturbance associated with the SCE Orange County System Alternative would increase the possibility of disturbing surface and subsurface cultural and paleontological resources. While impacts to cultural resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would likely have greater cultural resource impacts than the Proposed Project because it involves more ground disturbance in previously undisturbed areas.

4.6 GEOLOGY AND SOILS

The SCE Orange County System Alternative would be located in a similar geologic setting to the Proposed Project and would involve the installation of similar structures. The new substation, portions of the transmission line, and portions of the subtransmission lines would be located within 1 mile of known earthquake faults. The SCE Orange County System Alternative, like the Proposed Project, is not located in the vicinity of historic landslides or on unstable geologic units. A SWPPP and proper engineering practices would be implemented for both the SCE Orange County System Alternative and the Proposed Project. As a result, the SCE Orange County System Alternative would have similar impacts to geology and soils as the Proposed Project. Based on the information SCE has analyzed, impacts to geology and soils would be less than significant.

4.7 HAZARDS AND HAZARDOUS MATERIALS

The majority of the SCE Orange County System Alternative (approximately 22 miles of transmission line) would be constructed within a CPUC Tier 3 (i.e., extreme) fire threat area. Portions of the Proposed Project (approximately 12 miles of transmission and subtransmission line and the new Alberhill Substation) would also be constructed in high-fire-threat areas. Similar measures would be implemented for both the SCE Orange County System Alternative and the Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenance~~O&M. In order to evaluate the risk of wildfire, SCE utilized its MARS model from the RAMP proceeding to determine the relative contribution that each of the system alternatives would make to increase the overall wildfire risk profile of SCE's system. The SCE Orange County System Alternative would cause a greater increase in wildfire risk profile than the Proposed Project if implemented. Similar to the Proposed Project, measures would be implemented for the SCE Orange County System Alternative to reduce the risk of transport, use, or disposal of hazardous materials and the release of hazardous materials, substances, or waste.

Similar to the Proposed Project, off-road equipment and on-road vehicle use are anticipated to be the dominant noise sources during construction; therefore, noise from local airports would not pose a hazard for construction personnel. In addition, neither the SCE Orange County System Alternative nor Proposed Project would involve construction on a site known to have hazardous waste or contamination. While impacts to hazards and hazardous materials would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater hazard and hazardous material impacts than the Proposed Project because it involves the construction and ~~operation and maintenanceof~~O&M of more new facilities within a CPUC Tier 3 fire threat area.

4.8 HYDROLOGY AND WATER QUALITY

The SCE Orange County System Alternative would be constructed with similar construction techniques to the Proposed Project; however, it would be located in an area that has more topographic variation and undeveloped areas than the Proposed Project. This topographic variation ~~will~~would result in a higher potential to affect water quality in the area due to the grading associated with the construction of new, permanent access roads and pads to install and maintain the transmission facilities. Further, the increased construction in undeveloped areas is likely to result in the direct impact of more jurisdictional water features when compared to the Proposed Project. Similar to the Proposed Project, the SCE Orange County System Alternative would implement measures to reduce the potential for impacts to water quality and changes in drainage patterns. Both the SCE Orange County System Alternative and Proposed Project would involve the construction of a new substation. These substations would be of similar size and introduce a similar amount of new impermeable surfaces. The installation of new overhead transmission and subtransmission facilities would result in minimal increases in impermeable surfaces; therefore, both would lead to similar levels of increased runoff. While impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater hydrology and water quality impacts than the Proposed Project because it involves more grading in undeveloped areas and is likely to impact more jurisdictional water features.

4.9 LAND USE AND PLANNING

The SCE Orange County System Alternative would be located in unincorporated portions of Orange, San Diego, and Riverside counties, and the cities of Murrieta and Wildomar. Similar to the Proposed Project, the new substation would be constructed in a primarily undeveloped area; therefore, it would not divide an established community. In addition, the overhead transmission and subtransmission lines associated with the SCE Orange County System Alternative and Proposed Project would not impair movement or otherwise physically divide communities. The SCE Orange County System Alternative would involve the construction of a new, double-circuit transmission line across approximately 5.5 miles of the CNF and approximately 4.7 miles of the Santa Rosa Plateau Ecological Reserve. Though these existing land uses promote open space, utility uses are typically allowed. Lastly, the SDG&E System Alternative and Proposed Project would participate in one or more Habitat Conservation Plans and/or Natural Community Conservation Plans. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the SCE Orange County System Alternative would have less-than-significant impacts on land use and planning with the implementation of applicant-proposed and/or mitigation measures.

4.10 MINERAL RESOURCES

The Proposed Project is partially located within an identified MRZ-3 zone and would result in the potential loss of exploration and utilization of potentially occurring mineral resources due to the installation of new facilities. The SCE Orange County System Alternative is not located within a known MRZ and therefore would not impact known mineral resources. As a result, and based on the information SCE has analyzed, there would be no impact; the Orange County System Alternative would have less impact to mineral resources when compared to the Proposed Project.

4.11 NOISE

The northeastern portion of the SCE Orange County System Alternative is characterized by urban development and the remainder is characterized by undisturbed steep hills and terrain. The majority of the new transmission line construction would occur within undeveloped areas where limited noise sensitive receptors would be present. Similar to the Proposed Project, the majority of the subtransmission line construction would occur along existing roadways and in developed areas. The SCE Orange County System Alternative and Proposed Project would also utilize similar construction techniques; therefore, noise levels during construction of the transmission and subtransmission lines would be similar. In addition, the ~~operation and maintenance~~O&M practices of (and therefore the noise from) these facilities would be similar for the SCE Orange County System Alternative and the Proposed Project. The new substation would have existing residences approximately 0.25 mile to the northeast, while Alberhill Substation would be surrounded by undeveloped uses. While impacts to noise would be significant with the implementation of applicant-proposed and/or mitigation measures, the SCE Orange County System Alternative would have greater noise impacts than the Proposed Project because the construction and ~~operation and maintenance~~O&M of the substation would be located closer proximity to sensitive receptors.

4.12 POPULATION AND HOUSING

Similar to the Proposed Project, the SCE Orange County System Alternative would rely on a primarily local workforce and would not induce population growth. Neither the Proposed Project nor the SCE Orange County System Alternative would displace substantial numbers of existing housing units or people, and no new housing would need to be constructed. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the SCE Orange System Alternative would have less-than-significant impacts on population and housing.

4.13 PUBLIC SERVICES

The majority of the SCE Orange County System Alternative (approximately 22 miles of transmission line) would be constructed in CPUC Tier 3 (i.e., extreme) fire threat areas. Portions of the Proposed Project (approximately 12 miles of transmission and subtransmission line and the new Alberhill Substation) would also be constructed in high-fire-threat areas. Similar measures would be implemented for both the SCE Orange County System Alternative and the

Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenance~~O&M and the measures would not require the expansion of fire protection services. In addition, the majority of the transmission line construction would occur off of public roadways, reducing the potential impact on government agency response times. Neither the SCE Orange County System Alternative nor the Proposed Project would be likely to require the use of law enforcement agencies, nor would either induce population growth requiring the construction of additional governmental or public facilities. As a result, similar to the Proposed Project and based on the information SCE has analyzed, impacts to public services would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.14 RECREATION

The SCE Orange County System Alternative would cross the Santa Rosa Plateau Ecological Reserve, which includes multi-use trails for recreational activities. Construction of the new transmission line would result in temporary access restrictions or a partial closure of the reserve and some of the associated trails. The Proposed Project would also require the temporary closure of one existing park during conductor stringing. If construction crews from the local workforce are not used, similar to the Proposed Project, there is the potential for an increase the use of recreational facilities. Neither the Proposed Project nor the SCE Orange County System Alternative would involve the construction or expansion of existing recreational facilities. As a result, similar to the Proposed Project and based on the information SCE has analyzed, impacts to recreation would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.15 TRANSPORTATION AND TRAFFIC

The SCE Orange County System Alternative would involve construction of approximately 7.6 miles of subtransmission line along existing roadways. This is less than the 17.5 miles of subtransmission line construction along existing roadways associated with the Proposed Project. While the SCE Orange County System Alternative and Proposed Project are anticipated to use similar construction techniques, which would likely require temporary lane and/or road closures, the reduced length of construction along existing roadways is likely to result in less congestion during construction. Similar ~~operation and maintenance~~O&M activities would be utilized for the SCE Orange County System Alternative and the Proposed Project; therefore, these impacts would be similar. Similar to the Proposed Project, the SCE Orange County System Alternative is not anticipated to increase hazards, result in inadequate emergency access, result in inadequate parking, or conflict with alternative transportation. As a result, the SCE Orange County System Alternative would have less impact on transportation and traffic than the Proposed Project. Based on the information SCE has analyzed, impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.16 UTILITIES AND SERVICE SYSTEMS

The SCE Orange County System Alternative and the Proposed Project would have similar grading requirements for substation construction. The Proposed Project and alternative would also have similar landfill, solid waste, and water treatment requirements. As a result, the SCE Orange County System Alternative would have similar impacts to utilities and service systems to the Proposed Project. Based on the information SCE has analyzed, impacts to utilities and service systems would be less than significant.

MIRA LOMA SYSTEM ALTERNATIVE

4.1 AESTHETICS

The Mira Loma System Alternative is located in unincorporated portions of Riverside County as well as in the cities of Ontario, Norco, and Corona. The system alternative is located in areas primarily characterized as developed, including residential, commercial, and industrial areas. The new substation would be visible from residential areas; however, it would be located on a parcel that currently contains an existing SCE transmission corridor. It ~~will~~would also be adjacent to SCE's existing Mira Loma Substation. The proposed Alberhill Substation would be located in a more rural setting where it would be visible to motorists utilizing Interstate 15. The new subtransmission line portion of the system alternative between this new substation and Ivy Glen Substation would extend approximately 21.6 miles along existing roadways. Similar to the Proposed Project, portions of the new subtransmission line would be constructed in areas where SCE owns and operates existing overhead transmission and subtransmission line facilities. Due to the relatively developed nature of this route, the new subtransmission line would represent an incremental change in the existing visual character. In addition, the short new subtransmission line near Fogarty Substation would be built adjacent to an existing overhead subtransmission line, representing an incremental change in visual character. While this system alternative involves more new subtransmission line construction than the Proposed Project, the Mira Loma System Alternative would result in similar impacts to the Proposed Project due to its location in a previously developed area. Based on the information SCE has analyzed, impacts to aesthetics would be significant with the implementation of applicant-proposed and/or mitigation measures.

4.2 AGRICULTURAL RESOURCES

Similar to the Proposed Project, the Mira Loma System Alternative would not cross Unique Farmland~~, or~~ Williamson Act land~~, or Farmland of Statewide Importance~~.[2] However, approximately 0.5 mile of new, double-circuit subtransmission line would be constructed within Prime Farmland~~.~~ compared to the approximately 0.71 acre of temporary impacts and 0.04 acre of permanent impacts to Prime Farmland and 0.78 acre of temporary impacts to Farmland of Statewide Importance associated with the Proposed Project. While impacts to agriculture would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the Mira Loma System Alternative would likely have greater agricultural impacts than the Proposed Project because it involves more construction within Prime Farmland.

4.3 AIR QUALITY

The Mira Loma System Alternative would utilize similar construction methods, equipment, and crew sizes as the Proposed Project. As a result, the Mira Loma System Alternative and the Proposed Project would result in similar daily criteria air pollutant emissions from the use of off-road equipment and on-road vehicles. Both the Mira Loma System Alternative and the Proposed Project have existing access along the majority of their transmission and subtransmission routes; therefore, grading to establish access roads and permanent pads to install and maintain these facilities would be considered similar. As a result, the Mira Loma System Alternative's impacts to air quality would be similar to those associated with the Proposed Project. Based on the information SCE has analyzed, impacts to air quality would be significant with the implementation of applicant-proposed and/or mitigation measures.

4.4 BIOLOGICAL RESOURCES

The Mira Loma System Alternative's subtransmission line components would primarily be constructed adjacent to existing roadways, limiting the need for grading to establish access and permanent pads to operate and maintain these facilities. Similarly, the Proposed Project's subtransmission line components would primarily consist of construction along existing roadways or where SCE has already established permanent access. The Mira Loma System Alternative would require the construction of new, double-circuit subtransmission line across the Santa Ana River, where special-status species are known to occur. The substations associated with the Mira Loma System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use. Due to the similar levels of ground disturbance and the limited special-status species habitat along the Mira Loma System Alternative route, this alternative and the Proposed Project would have similar impacts to biological resources. Based on the information SCE has analyzed, impacts to biological resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.5 CULTURAL RESOURCES

The Mira Loma System Alternative's subtransmission line components would primarily be constructed adjacent to existing roadways, limiting the need for grading to establish access and permanent pads to operate and maintain these facilities. Similarly, the Proposed Project's subtransmission line components would primarily consist of construction along existing roadways or where SCE has already established permanent access. The substations associated with the Mira Loma System Alternative and the Proposed Project would require similar levels of grading to prepare the site for use. Because surface and subsurface cultural and paleontological resources are most likely to be disturbed during ground-disturbing activities, the Mira Loma System Alternative and the Proposed Project would likely have similar impacts to cultural resources. Based on the information SCE has analyzed, impacts to cultural resources would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.6 GEOLOGY AND SOILS

The Mira Loma System Alternative would be located in a similar geologic setting to the Proposed Project and would involve the installation of similar structures. The Mira Loma System Alternative would not be located within 1 mile of known earthquake faults, nor in the vicinity of historic landslide or unstable geologic units. A SWPPP and proper engineering practices would be implemented for both the Mira Loma System Alternative and the Proposed Project. As a result, the Mira Loma System Alternative would have similar impacts to geology and soils as the Proposed Project. Based on the information SCE has analyzed, impacts to geology and soils would be less than significant.

4.7 HAZARDS AND HAZARDOUS MATERIALS

The Mira Loma System Alternative would be constructed within developed areas or areas of low fire threat. In contrast, the Proposed Project would be constructed in high-fire-threat areas. Similar measures would be implemented for both the Mira Loma System Alternative and the Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenance~~O&M. In order to evaluate the risk of wildfire, SCE utilized its MARS model from the RAMP proceeding to determine the relative contribution that each of the system alternatives would make to increase the overall wildfire risk profile of SCE's system. The Mira Loma System Alternative would result in a smaller increase to in wildfire risk profile than the Proposed Project if implemented. Similar to the Proposed Project, measures would be implemented for the Mira Loma System Alternative to reduce the risk of transport, use, or disposal of hazardous materials and the release of hazardous materials, substances, or waste. Similar to the Proposed Project, off-road equipment and on-road vehicle use are anticipated to be the dominant noise sources during construction; therefore, noise from local airports would not pose a hazard for construction personnel. In addition, neither the Mira Loma System Alternative nor Proposed Project would involve construction on a site known to have hazardous waste or contamination. As a result of the reduced impact on the MARS baseline, the Mira Loma System Alternative would have less impacts to hazards and hazardous materials when compared to the Proposed Project. Based on the information SCE has analyzed, impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.8 HYDROLOGY AND WATER QUALITY

The Mira Loma System Alternative would be constructed with similar construction techniques to the Proposed Project and would be also be located primarily along existing roadways. Because the new subtransmission line would be installed primarily in developed areas, limited grading (and thus, limited impacts to jurisdictional water features) would be anticipated. Similar to the Proposed Project, the SCE Mira Loma System Alternative would implement measures to reduce the potential for impacts to water quality and changes in drainage patterns. Both the Mira Loma System Alternative and the Proposed Project would involve the construction of a new substation. These substations would be of similar size and introduce a similar amount of new impermeable surfaces. The installation of new overhead subtransmission facilities would result in minimal increases in impermeable surfaces; therefore, both would lead to similar levels of increased runoff. Due to the limited grading and anticipated impacts to potentially jurisdictional water features, the Mira Loma System Alternative would result in similar impacts to hydrology and water quality as the Proposed Project. Based on the information SCE has analyzed, impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures.

4.9 LAND USE AND PLANNING

The Mira Loma System Alternative would be located in unincorporated portions of Riverside County and in the cities of Ontario, Norco, and Corona. The new substation would be constructed in an area surrounded by industrial uses and undeveloped land that is zoned for residential uses, but that is vacant. Similar to the Proposed Project, construction of the substation would not divide an established community. In addition, the overhead transmission and subtransmission lines associated with the Mira Loma System Alternative and Proposed Project would not impair movement or otherwise physically divide communities. The Mira Loma System Alternative substation would be constructed within the Rich-Haven Specific Plan area in a location that is planned for single-family residential housing. The area includes existing SCE utility corridors and is adjacent to SCE's existing Mira Loma Substation. Lastly, the SDG&E System Alternative and Proposed Project would participate in one or more Habitat Conservation Plans and/or Natural Community Conservation Plans. While impacts to land use and planning would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the Mira Loma System Alternative would have greater land use and planning impacts than the Proposed Project because construction of the substation would conflict with an existing specific plan.

4.10 MINERAL RESOURCES

The Proposed Project is partially located within an identified MRZ-3 zone and would result in the potential loss of exploration and utilization of potentially occurring mineral resources due to the installation of new facilities. The Mira Loma System Alternative is not located within a known MRZ and therefore would not impact known mineral resources. As a result, and based on the information SCE has analyzed, there would be no impact; the Mira Loma System Alternative would have less impact to mineral resources when compared to the Proposed Project.

4.11 NOISE

The Mira Loma System Alternative is primarily characterized as developed, including residential, commercial, and industrial areas. The new transmission line and the majority of the new subtransmission line would be constructed in developed or residential areas. As a result, these facilities would be located in close proximity to multiple sensitive noise receptors. While the Mira Loma System Alternative and Proposed Project would utilize similar construction~~, operation, and maintenance~~and O&M techniques, the Mira Loma System Alternative's proximity to a greater number of sensitive noise receptors would lead to more impacts than the Proposed Project. The new substation would be located in a primarily industrial area with limited sensitive noise receptors; therefore, the noise impacts associated with the construction~~, operation,~~ and ~~maintenance~~O&M of this substation would be similar to those associated with Alberhill Substation. While impacts to noise would be significant with the implementation of applicant-proposed and/or mitigation measures, the Mira Loma System Alternative would have greater impacts to noise when compared to the Proposed Project because it involves construction in closer proximity to more sensitive noise receptors.

4.12 POPULATION AND HOUSING

Similar to the Proposed Project, the Mira Loma System Alternative would rely on a primarily local workforce and would not induce population growth. Neither the Proposed Project nor the Mira Loma System Alternative would displace substantial numbers of existing housing units or people, and no new housing would need to be constructed. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the Mira Loma System Alternative would have less-than-significant impacts on population and housing.

4.13 PUBLIC SERVICES

The Mira Loma System Alternative would be constructed within developed areas or areas of low fire threat. In contrast, the Proposed Project would be constructed in high-fire-threat areas. Similar measures would be implemented for both the Mira Loma System Alternative and the Proposed Project to reduce the risk of wildfire during construction~~, operation,~~ and ~~maintenance~~O&M and the measures would not require the expansion of fire protection services. The majority of the subtransmission line construction for the Mira Loma System Alternative would occur in more densely populated areas than the Proposed Project. Work along these existing public roadways would likely require temporary lane and/or road closure and would have the potential to increase government agency response times. Neither the Mira Loma System Alternative nor the Proposed Project would be likely to require the use of law enforcement agencies, nor would either induce population growth requiring the construction of additional governmental or public facilities. While impacts to public services would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the Mira Loma System Alternative would have greater public service impacts than the Proposed Project because it involves more construction along roadways in densely populated areas, likely leading to increased agency response times.

4.14 RECREATION

Similar to the Proposed Project, the Mira Loma System Alternative may require the temporary closure of existing parks and other recreational facilities located adjacent to the subtransmission line. If construction crews from the local workforce are not used, similar to the Proposed Project, there is the potential for an increase the use of recreational facilities. The Proposed Project and Mira Loma System Alternative would not involve the construction or expansion of existing recreational facilities. As a result, similar to the Proposed Project and based on the information SCE has analyzed, the Mira Loma System Alternative would have less-than-significant impacts on recreation with the implementation of applicant-proposed and/or mitigation measures.

4.15 TRANSPORTATION AND TRAFFIC

The Mira Loma System Alternative would involve construction of approximately 21.6 miles of subtransmission line along existing roadways. This is greater than the 17.5 miles of subtransmission line construction along existing roadways associated with the Proposed Project. While the Mira Loma System Alternative and Proposed Project are anticipated to use similar construction techniques, which would likely require temporary lane and/or road closures, the increased length of construction along existing roadways is likely to result in an increase in congestion during construction. Similar ~~operation and maintenance~~O&M activities would be utilized for the Mira Loma System Alternative and the Proposed Project; therefore, these impacts would be similar. Similar to the Proposed Project, the Mira Loma System Alternative is not anticipated to increase hazards, result in inadequate emergency access, result in inadequate parking, or conflict with alternative transportation. While impacts would be less than significant with the implementation of applicant-proposed and/or mitigation measures, the Mira Loma System Alternative would have greater transportation and traffic impacts than the Proposed Project because it involves more construction along roadways in densely populated areas, likely leading to increased congestion.

4.16 UTILITIES AND SERVICE SYSTEMS

The Mira Loma System Alternative and the Proposed Project would have similar grading requirements for substation construction. The Proposed Project and alternative would also have similar landfill, solid waste, and water treatment requirements. As a result, the Mira Loma System Alternative would have similar impacts to utilities and service systems to the Proposed Project. Based on the information SCE has analyzed, impacts to utilities and service systems would be less than significant.

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5.0 COMPARISON OF ALTERNATIVES

This section compares the environmental impacts of the alternatives. California Environmental Quality Act (CEQA) Guidelines (Section 15126.6(d)) require that an environmental impact report include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Original Alberhill System Project (Original ASP) and the Original ASP with the design modification and additional engineering refinements incorporated ~~or~~ (Proposed Project).

The ~~Basic Ojectives~~basic objectives, developed in Section 1.3, are as follows:

- Serve current and long-term projected electrical demand requirements in the Electrical Needs Area
- Increase system operational flexibility and maintain system reliability by creating system ties that establish the ability to transfer substations from the current Valley South 115 Kilovolt (kV) System
- Transfer a sufficient amount of load off of the Valley South 115 kV System to maintain a positive reserve capacity on the Valley South 115 kV System through the 10-year planning horizon
- Provide safe and reliable electrical service consistent with Southern California Edison's (SCE's) Transmission Planning Criteria and Guidelines
- Increase electrical system reliability by constructing a project in a location suitable to serve the Electrical Needs Area
- Meet project need while minimizing environmental impacts
- Meet project need in a cost-effective manner

These objectives guide ~~in developing~~the development of a reasonable range of ~~reasonable~~ alternatives to the project, or ~~to~~ the location of the project, which would feasibly attain most of the basic objectives. All of the alternatives evaluated in here and in Chapter 4 of this ~~second~~ third amendment to the Proponent's Environmental Assessment (PEA), with the exception of the No Project Alternative, satisfy the project objectives.

General Order No. 131-D requires that an Application for a Certificate of Public Convenience and Necessity include the "[r]easons for adoption of the route selected, including comparison with alternative routes, including the advantages and disadvantages of each."

As described in Chapter 4, Environmental Impact Assessment, with the implementation of Applicant Proposed Measures, the Proposed Project would have a potentially significant impact to air quality. All other impacts from construction and operation of the Proposed Project were anticipated to be less than significant. The Final Environmental Impact Report (FEIR), dated April 2017, supersedes the PEA and concluded there were Significant impacts to Aesthetics, Air

Quality, and Noise and Vibration.[1] The FEIR also concluded there were Less than Significant impacts to Agriculture and Forestry Resources; Biological Resources; Cultural Resources; Geology, Soils, and Minerals; Greenhouse Gases; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Population and Housing; Public Services and Utilities; Recreation; and Transportation.

As discussed in Chapter 2, Project Alternatives, both the Proposed Project and the Proposed Project with the Alternative 115 kV Segment incorporated have the ability to meet the project objectives~~serve the Alberhill System Project~~. However, the new 115 kV subtransmission line associated with the Proposed Project would be built along paved roads, facilitating access for construction and maintenance, minimizing environmental impacts. The Alternative 115 kV Segment would require construction on unpaved roads in hilly terrain along a route that is slightly longer in length. This would require more earthwork and dust control during construction.

Chapter 2, Project Alternatives also provides a detailed description of three additional ~~System Alternatives~~system alternatives—San Diego Gas & Electric Company (SDG&E), SCE Orange County, and Mira Loma—that have been developed to meet the ASP's ~~Project Objectives~~project objectives.

The SDG&E system alternative would be located in unincorporated portions of San Diego and Riverside counties, the City of Temecula, and the community of Rainbow. Similar to the Proposed Project, a new, approximately 15-acre substation would be constructed on undeveloped land. This system alternative would involve the construction of approximately 6.4 miles of new, double-circuit transmission line within previously undisturbed, hilly terrain. This portion of the SDG&E system alternative would require new, permanent access roads and pads for installation and operation and maintenance of the transmission facilities. This would require more earthwork and dust control during construction. This component of the system alternative would also cross the Pechanga Reservation. The remainder of the system alternative would primarily be constructed along existing roadways, similar to the Proposed Project.

The SCE Orange County system alternative would be located in unincorporated portions of Orange, San Diego, and Riverside counties, the cities of Murrieta and Wildomar. Similar to the Proposed Project, a new, approximately 15-acre substation would be constructed on undeveloped land. This system alternative would also involve the construction of approximately 22.6 miles of new, double-circuit transmission line within previously undisturbed, hilly terrain. This portion of the SCE Orange County system alternative would require new, permanent access roads and pads for installation and operation and maintenance of the transmission facilities. This would require more earthwork and dust control during construction. This component system alternative would also cross Cleveland National Forest, under the jurisdiction of the United States Forest Service, and the Santa Rosa Plateau Ecological Reserve, under the jurisdiction of the California

[1] The FEIR also determined there would be significant cumulative impacts to Aesthetics, Air Quality, and Biological Resources. It also determined there would be a potential for significant cumulative impacts to Cultural Resources if multiple projects were to impact the same known resource.

Department of Fish and Wildlife. The remainder of the system alternative would generally be constructed adjacent to existing roadways in developed areas, similar to the Proposed Project.

The Mira Loma system alternative would be located in unincorporated portions of Riverside County, and the cities of Ontario, Norco, and Corona. Similar to the Proposed Project, a new, approximately 15-acre substation would be constructed on undeveloped land. This system alternative involves approximately 21.6 miles of new, double-circuit subtransmission line construction primarily adjacent to existing roads in developed areas. An additional, approximately 0.6-mile segment of new subtransmission line would be constructed adjacent to an existing subtransmission line near SCE's Fogarty Substation. As a result, limited earth work and grading would be associated with this system alternative.

Table 5.1, Comparison of Alternatives, compares the environmental impact of the Original ASP, Proposed Project, the Alternative 115 kV Segment for the Original ASP, and the three ~~additional System Alternatives~~system alternatives introduced in the second amendment to the PEA by CEQA resource category.

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Table 5.1 Comparison of Alternatives

Section	~~Proposed Project~~Original ASP (PEA)	~~Proposed Project~~Original ASP (FEIR)	Proposed Project (Appendix O)	Alternative 115 kV Segment	SDG&E System Alternative	SCE Orange County System Alternative	Mira Loma System Alternative
Aesthetics	Less than significant	Significant and unavoidable	Significant and unavoidable	Similar to the Proposed Project	More than the Proposed Project	More than the Proposed Project	Similar to the Proposed Project
Agricultural Resources	Less than significant	Less than significant	Less than significant	Similar to the Proposed Project	More than the Proposed Project	More than the Proposed Project	More than the Proposed Project
Air Quality	Significant	Significant with mitigation	Significant with mitigation	More than the Proposed Project	More than the Proposed Project	More than the Proposed Project	Similar to the Proposed Project
Biological Resources	Less than significant	Less than significant with mitigation	Less than significant with mitigation	Similar to the Proposed Project	More than the Proposed Project	More than the Proposed Project	Similar to the Proposed Project
Cultural Resources	Less than significant	Less than significant with mitigation	Less than significant with mitigation	Similar to the Proposed Project	More than the Proposed Project	More than the proposed Project	Similar to the Proposed Project
Geology and Soils	Less than significant	Less than significant	Less than significant	More than the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project
Hazards and Hazardous Materials	Less than significant	Less than significant with mitigation	Less than significant with mitigation	More than the Proposed Project	Similar to the Proposed Project	More than the Proposed Project	Less than the Proposed Project
Hydrology and Water Quality	Less than significant	Less than significant with mitigation	Less than significant with mitigation	More than the Proposed Project	More than the Proposed Project	More than the Proposed Project	Similar to the Proposed Project
Land Use and Planning	No Impact	Less than significant with mitigation	Less than significant with mitigation	Same as the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project	More than the Proposed Project
Mineral Resources	Less than significant	Less than significant	Less than significant	Similar to the Proposed Project	Less than the Proposed Project	Less than the Proposed Project	Less than the Proposed Project
Noise	Less than significant	Significant and unavoidable	Significant and unavoidable	More than the Proposed Project	More than the Proposed Project	More than the Proposed Project	More than the Proposed Project
Population and Housing	No Impact	Less than significant	Less than significant	Same as the Proposed Project	Same as the Proposed Project	Same as the Proposed Project	Same as the Proposed Project
Public Services	Less than significant	Less than significant with mitigation	Less than significant with mitigation	Similar to the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project	More than the Proposed Project
Recreation	No Impact	Less than significant	Less than significant	Same as the Proposed Project	Less than the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project
Transportation and Traffic	Less than significant	Less than significant with mitigation	Less than significant with mitigation	Similar to the Proposed Project	Less than the Proposed Project	Less than the Proposed Project	More than the Proposed Project
Utilities and Service Systems	Less than significant	Less than significant	Less than significant	Similar to the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project	Similar to the Proposed Project

Note: The Alternative 115 kV Segment, as described in Chapter 2, Project Alternatives, is a route alternative for the Original ASP's 115 kV segment and would not affect the remaining Original ASP components (i.e., Alberhill Substation, 500 kV Transmission Line, and telecommunications system upgrades). The SDG&E, SCE Orange County, and Mira Loma System Alternatives would entirely replace the Original ASP.

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APPENDIX M: REVISED PROJECT DESCRIPTION

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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1 – INTRODUCTION

This appendix provides a complete description of the Alberhill System Project (Proposed Project or ASP) with the incorporation of the design modification and additional engineering refinements. This appendix was developed by beginning with Chapter 2 from the Final Environmental Impact Report (FEIR) and modifying it as follows:

- any language associated with the Valley-Ivyglen Project[1] has been marked with ~~blue double strikeout~~ due to the Valley-Ivyglen Project being constructed and made operational in 2022,
- edits made by the California Public Utilities Commission to the FEIR have been retained and are represented in purple text with additions underlined and deletions ~~struck through~~, and
- any necessary changes by SCE to the FEIR language to incorporate the changes to the Proposed Project have been made with additions in green underline and deletions in ~~red strikeout~~.

Appendix N: Project Design Comparison provides a matrix of the changes that have been made to the Proposed Project since the FEIR was published and a detailed map that depicts the changes.

2 – DESCRIPTION OF THE PROPOSED PROJECTS

Southern California Edison (SCE or the applicant) proposes to construct ~~the proposed Valley–Ivyglen 115-kilovolt (kV) Subtransmission Line Project (proposed Valley–Ivyglen Project) and~~ the proposed Alberhill System Project (proposed Alberhill Project or Proposed Project) in western Riverside County. ~~Both of the proposed projects~~The Proposed Project would be constructed within and in proximity to the ~~City~~cities of Lake Elsinore, Wildomar, and Menifee, California, in an area between the applicant's Valley Substation to the east and Ivyglen Substation to the west (Figure 2-1). This section describes the proposed Alberhill Project ~~and the proposed Valley–Ivyglen Project~~. Unless otherwise specified in a heading, subheading, or text, descriptions of project activities and components apply to both proposed projects.

2.1 OVERVIEW OF THE PROPOSED PROJECTS

This section provides general overviews of the ~~proposed Valley–Ivyglen Project and~~ proposed Alberhill Project.

~~2.1.1 Valley–Ivyglen Project Overview~~

~~The proposed Valley–Ivyglen Project would involve:~~

- ~~Construction of a new, single-circuit 115-kV subtransmission line~~~~[1]~~[2] ~~and fiber optic line. The route of the proposed Valley–Ivyglen Project would be approximately 27 miles long and constructed~~

[1] Valley-Ivyglen 115 Subtransmission Line Project (A.07-01-031 and A.07-04-028)

~~[1]~~[2] *Transmission lines* are designed to operate at or above 200 kV (CPUC 1995). For the purposes of this document, the term *subtransmission line* refers to powerlines designed to operate at between 50 kV and 200 kV. The proposed single-circuit subtransmission line would have three 115-kV conductor cables. Three-phase, alternating-current electrical transmission systems use at least three conductors to transmit electricity. By comparison, a double-circuit 115-kV line would typically have six 115-kV conductor cables. Double-circuit and single-circuit 115-kV lines would be constructed as part of the proposed Alberhill Project.

~~within approximately 23 miles of new ROW.[23]~~

- ~~Installation of overhead fiber optic lines on the proposed structures and underground in new (approximately (10,000 feet) and existing (approximately (13,200 feet) conduit.~~
- ~~Transfer of existing distribution circuits along portions of the proposed subtransmission line to new 115-kV structures or to underground positions.~~
- ~~Installation of new 115-kV switching and protective equipment at Valley and Ivyglen Substations.~~

~~The applicant estimates that construction of the proposed Valley–Ivyglen Project would take approximately 2827 months. It is anticipated that the proposed Valley–Ivyglen Project would be operational by Q4 2019the summer or fall 2018. Project features of the proposed projects are shown in Figures 2-2a through 2-2i.~~

2.1.2 Alberhill System Project Overview

The ~~proposed Alberhill~~Proposed Project would include construction of a new 1,120 megavolt ampere (MVA) 500/115 kV substation (Alberhill Substation~~), which would be expandable to a maximum of 1,680 MVA depending on future need.~~). In addition to construction of a new Alberhill Substation, the ~~proposed Alberhill~~Proposed Project would include the following:

- Construction of two new 500-kV transmission lines (approximately 3.3 miles, combined) within a new ROW to connect the proposed Alberhill Substation to the existing Serrano–Valley 500-kV Transmission Line;
- Double-circuit ~~Construction~~ of approximately ~~11.75~~10.6 miles of ~~new double-circuit 115-kV subtransmission lines and removal of 11 miles of~~ existing single-circuit 115-kV subtransmission lines with structure replacement primarily in the existing ROW;
- Construction of about 3 miles of single-circuit 115-kV subtransmission lines with distribution lines underbuilt on the subtransmission line structures and removal of about 3 miles of electrical distribution lines within the existing ROW;
- Installation of a second 115-kV circuit on approximately ~~6.5~~6.2 miles of ~~single-circuit~~ existing 115-kV subtransmission lines ~~(the single-circuit line is to be~~ constructed as part of the ~~proposed~~ Valley–Ivyglen 115 kV Subtransmission Line Project~~);~~ (Valley–Ivyglen Project);
- Installation of approximately 550 feet of new 115 kV underground subtransmission circuit within new duct banks and installation of approximately 4,000 feet of new 115 kV subtransmission circuit within existing duct banks.
- Installation of fiber optic lines overhead (approximately 9 miles) on sections of the new or modified subtransmission lines and underground (approximately 1 mile) in proximity to the proposed Alberhill Substation and several of the existing 115/12-kV substations;

[~~2~~3] For the purposes of this document, the term *ROW* refers to an area that the applicant would have legal access to for construction and operation of the proposed utility facilities. Legal access may be acquired in various ways, including by purchase, easement, or franchise agreement.

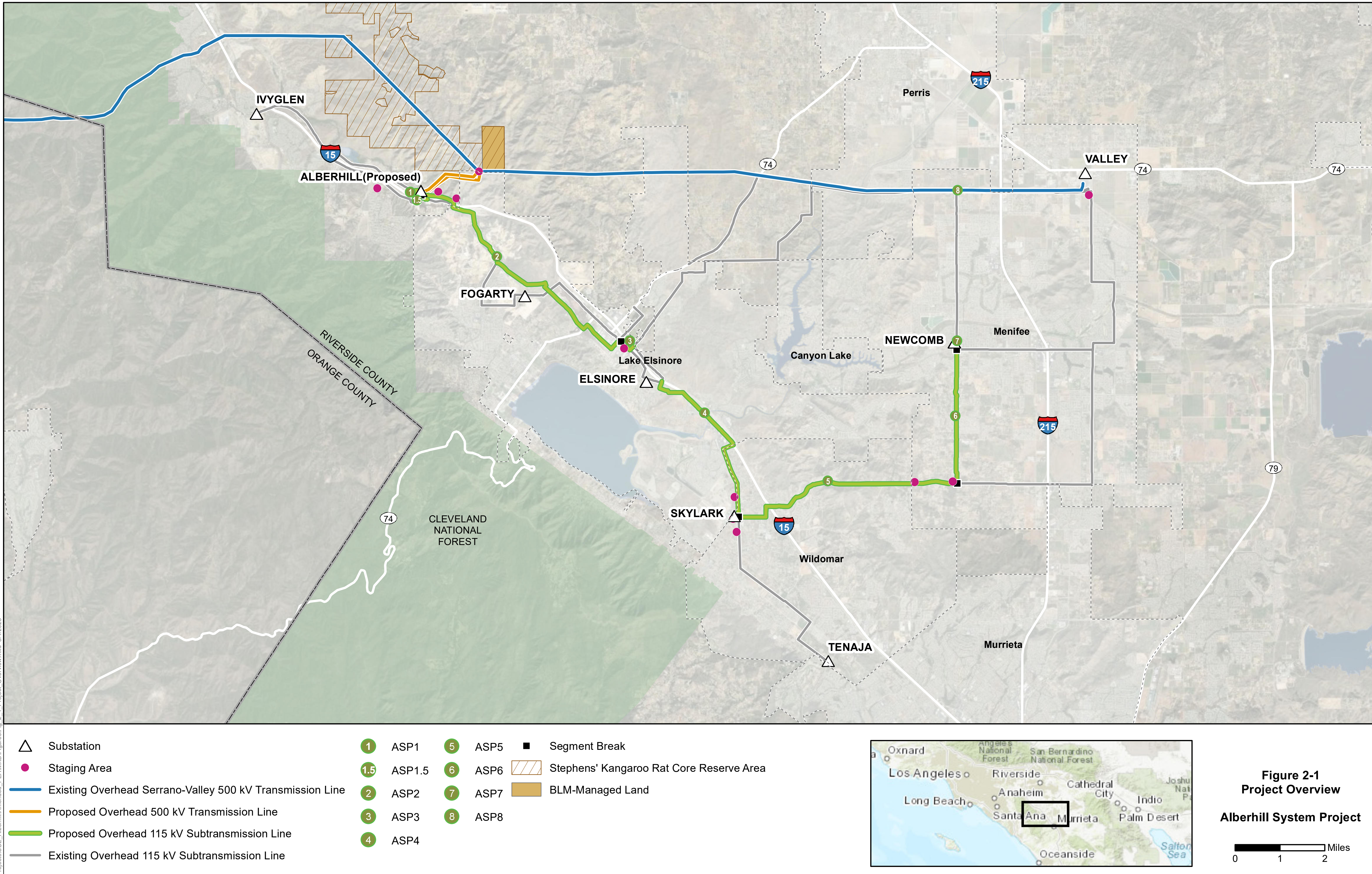
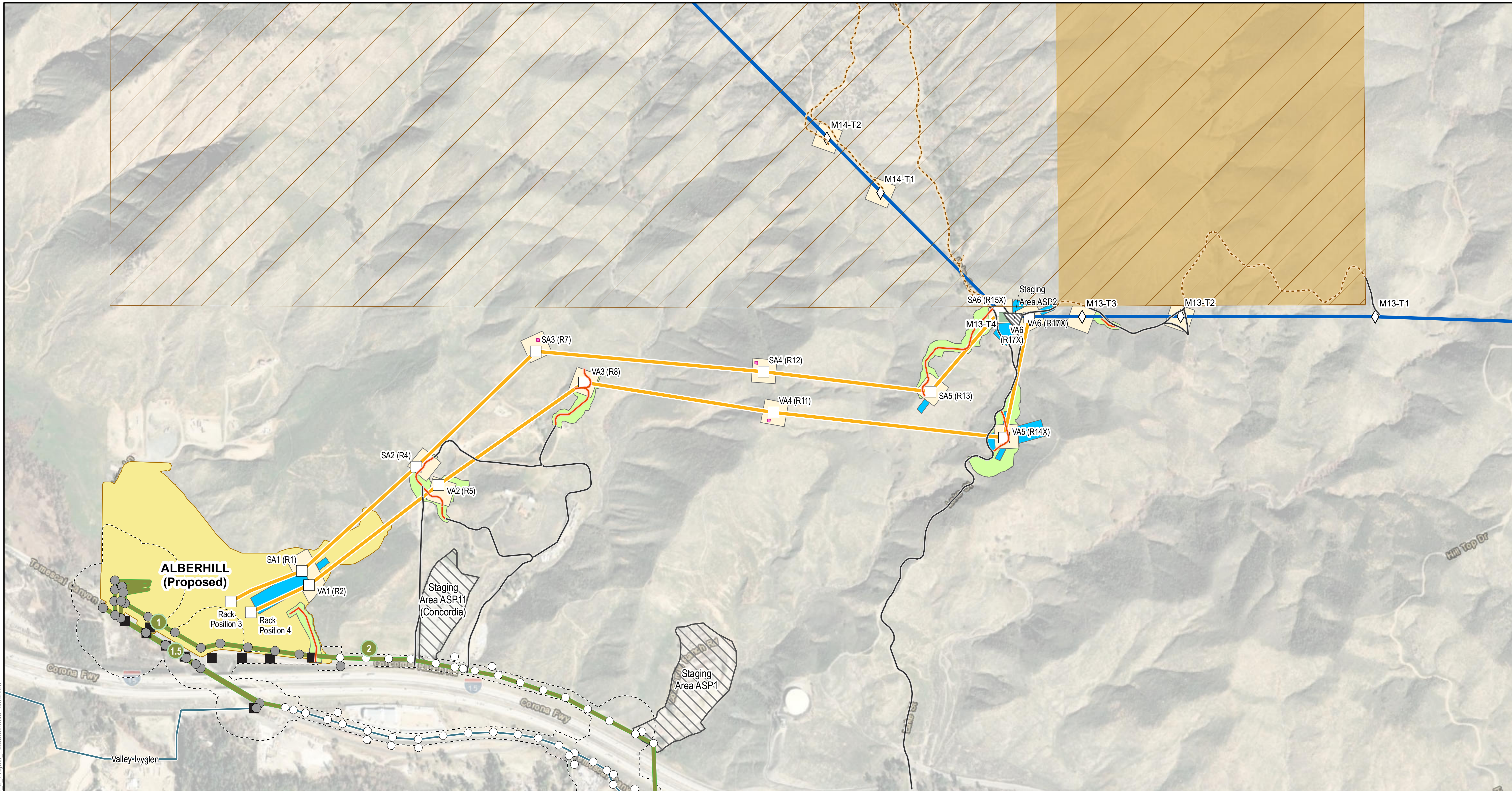


Figure 2-1
Project Overview

Alberhill System Project



ASP Segment
Existing 500 kV Tower
Proposed 500 kV Tower
Remove Existing 500 kV Tower
Proposed Overhead 500 kV Transmission Line
Existing Overhead Serrano-Valley 500 kV Transmission Line
Existing Pole/Structure
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Existing Overhead 115 kV Subtransmission Line
New Road
Existing Road (To Improve)
Existing Road (No Improvement)
Staging Area
115 kV General Disturbance Area
Proposed Alberhill Substation

500 kV Work Areas

Grading Limit/Ground Disturbance
Helicopter Landing Platform
Tower Work Area
Wire Setup
Stephens' Kangaroo Rat Core Reserve Area
BLM-Managed Land

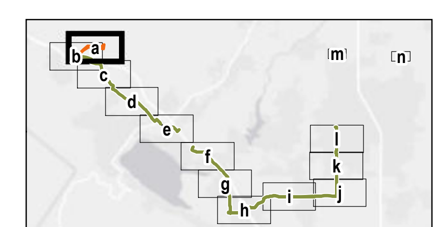


Figure 2-2a
Project Features

Alberhill System Project

Feet
0 400 800

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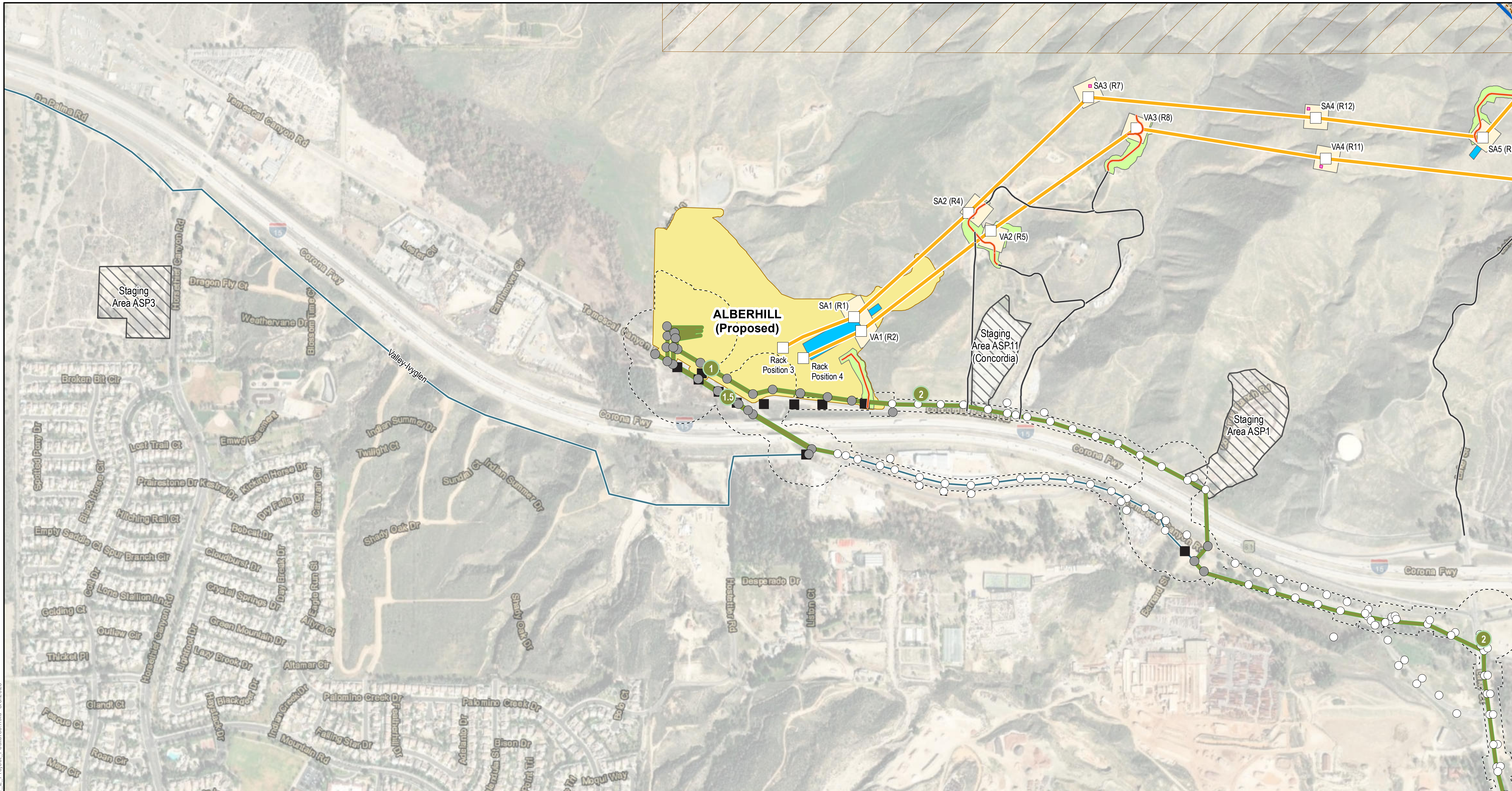

ASP Segment
Proposed 500 kV Tower
Proposed Overhead 500 kV Transmission Line
Existing Overhead Serrano-Valley 500 kV Transmission Line

Existing Pole/Structure
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Existing Overhead 115 kV Subtransmission Line

New Road
Existing Road (To Improve)
Existing Road (No Improvement)
Staging Area
115 kV General Disturbance Area
Proposed Alberhill Substation

500 kV Work Areas
Grading Limit/Ground Disturbance
Helicopter Landing Platform
Tower Work Area
Wire Setup

Stephens' Kangaroo Rat Core Reserve Area

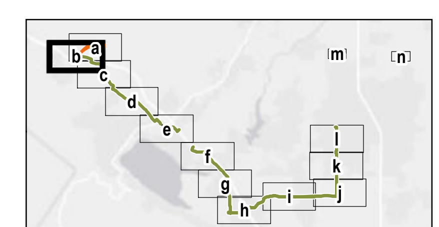

Figure 2-2b
Project Features

Alberhill System Project

Feet
0 400 800

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ASP Segment
Existing Pole/Structure
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Existing Overhead 115 kV Subtransmission Line
Existing Road (To Improve)
115 kV General Disturbance Area

Figure 2-2c
Project Features

Alberhill System Project

Feet
0 400 800

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ASP Segment
Existing Pole/Structure
Existing Substation
Proposed Overhead 115 kV Subtransmission Line
115 kV General Disturbance Area
Existing Overhead 115 kV Subtransmission Line

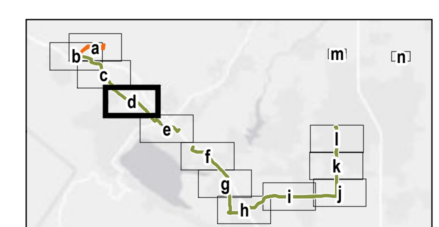

Figure 2-2d
Project Features

Alberhill System Project

0 400 800 Feet

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ASP Segment

Existing Pole/Structure

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Proposed 115 kV Cable in Existing Underground Duct Bank

Proposed 115 kV Cable in New Underground Duct Bank

Existing Overhead Idle 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Existing 115 kV Underground Vault

Staging Area

115 kV General Disturbance Area

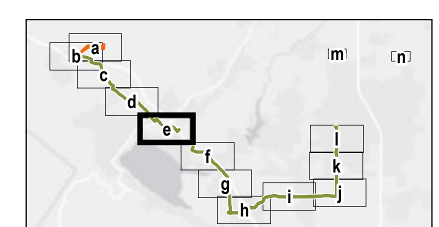

Figure 2-2e
Project Features

Alberhill System Project

Feet
0 400 800

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ASP Segment
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Existing Overhead Idle 115 kV Subtransmission Line
Existing Overhead 115 kV Subtransmission Line
Existing Substation
115 kV General Disturbance Area

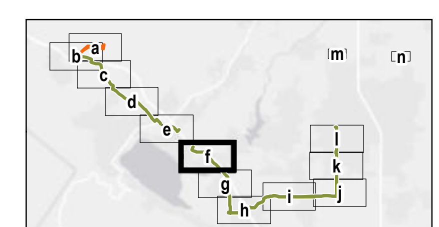

Figure 2-2f
Project Features

Alberhill System Project

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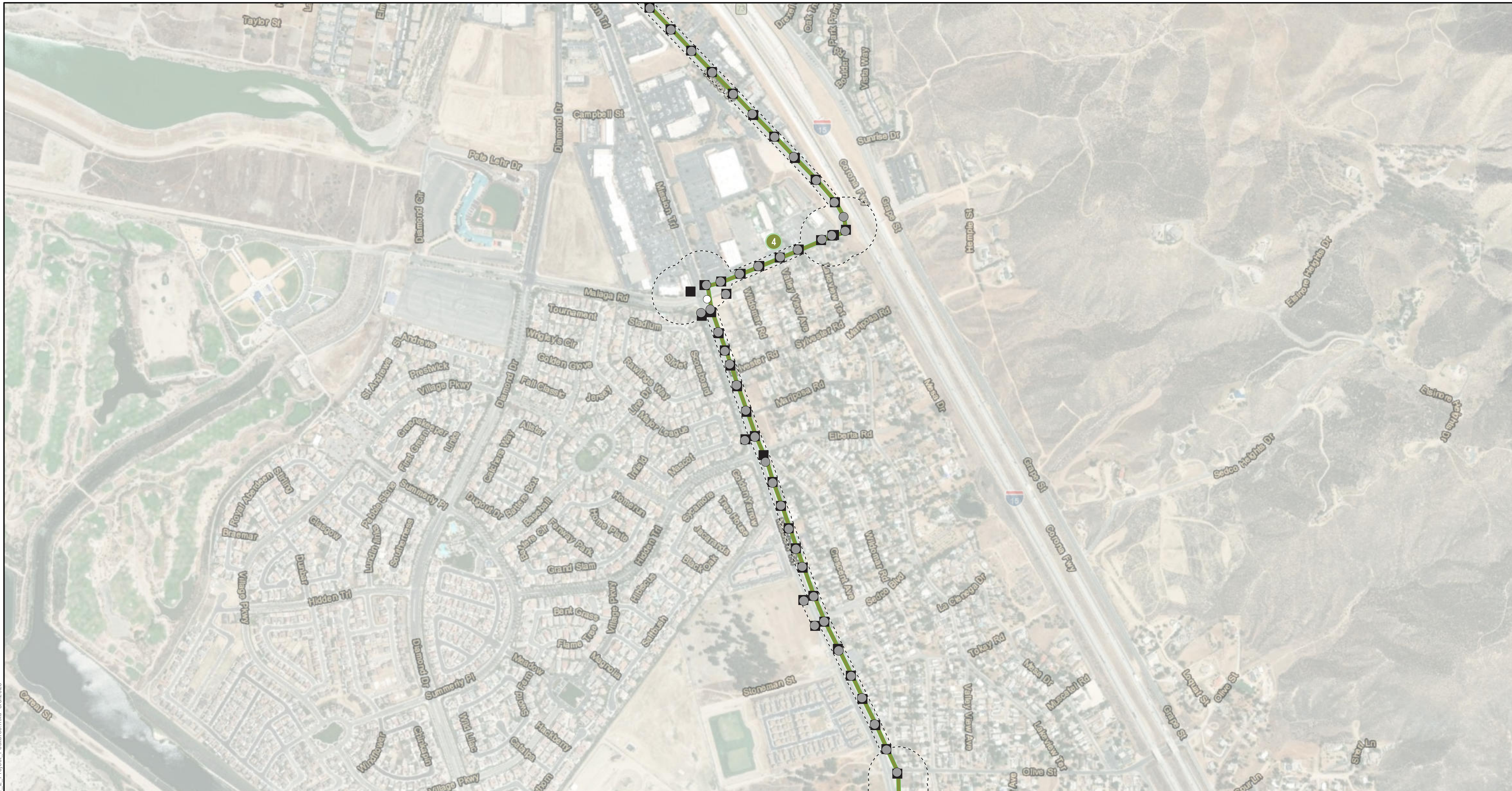

● ASP Segment
○ Existing Pole/Structure
● New/Modify Pole/Structure
■ Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
115 kV General Disturbance Area

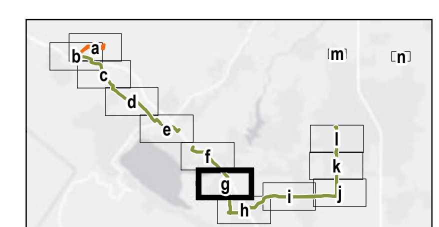

Figure 2-2g
Project Features

Alberhill System Project

Feet
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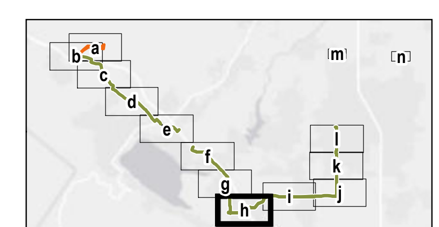

Figure 2-2h
Project Features

Alberhill System Project

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ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Staging Area

115 kV General Disturbance Area

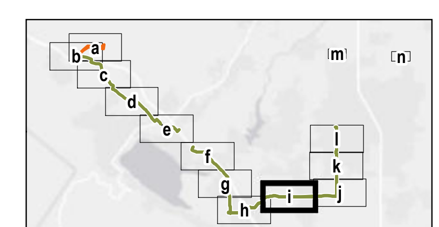

Figure 2-2i
Project Features

Alberhill System Project

Feet
0 400 800

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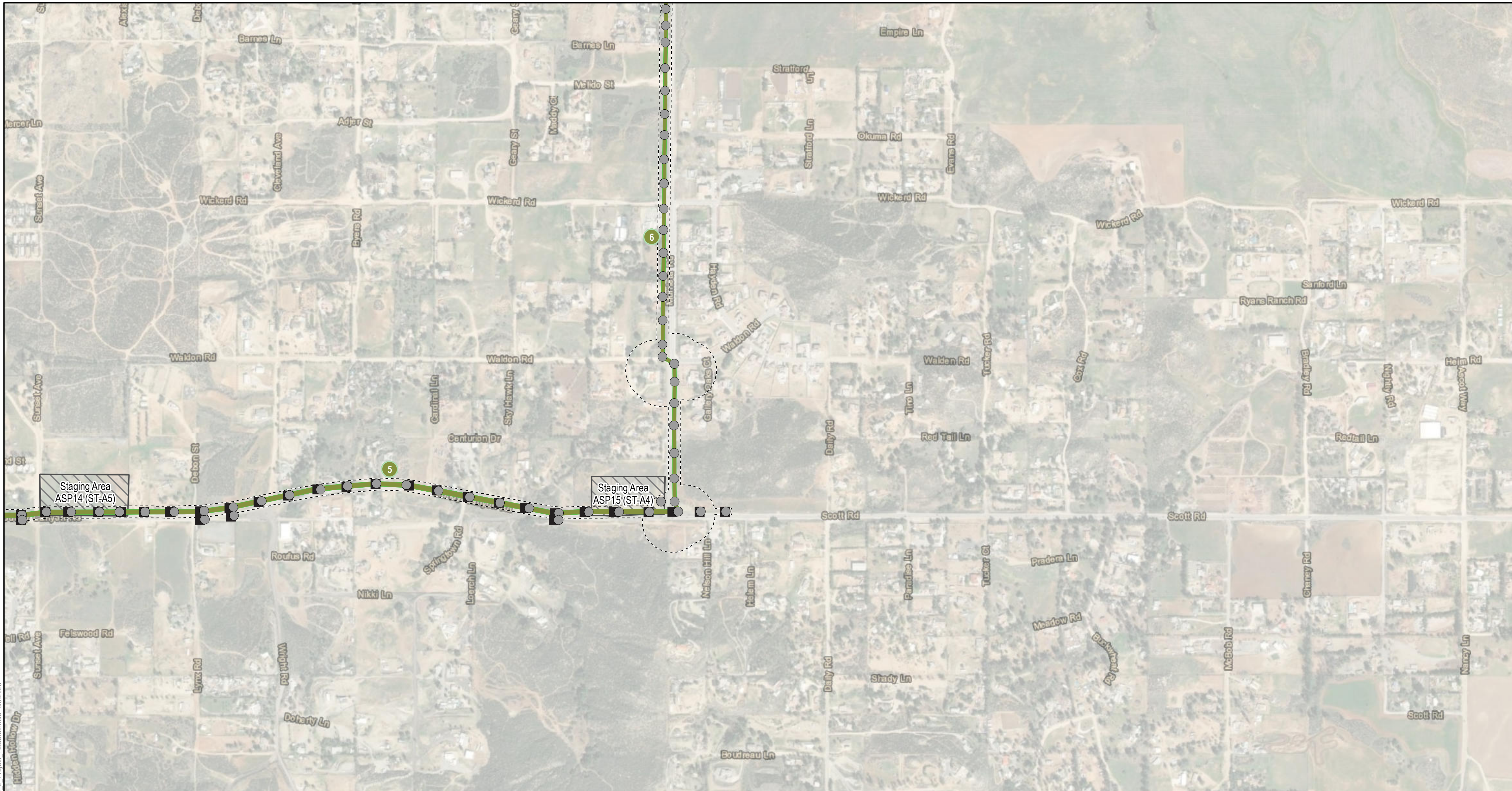

ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Staging Area

115 kV General Disturbance Area

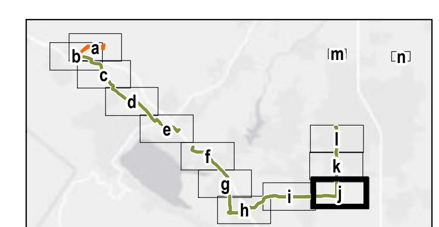

Figure 2-2j
Project Features

Alberhill System Project

0 400 800 Feet

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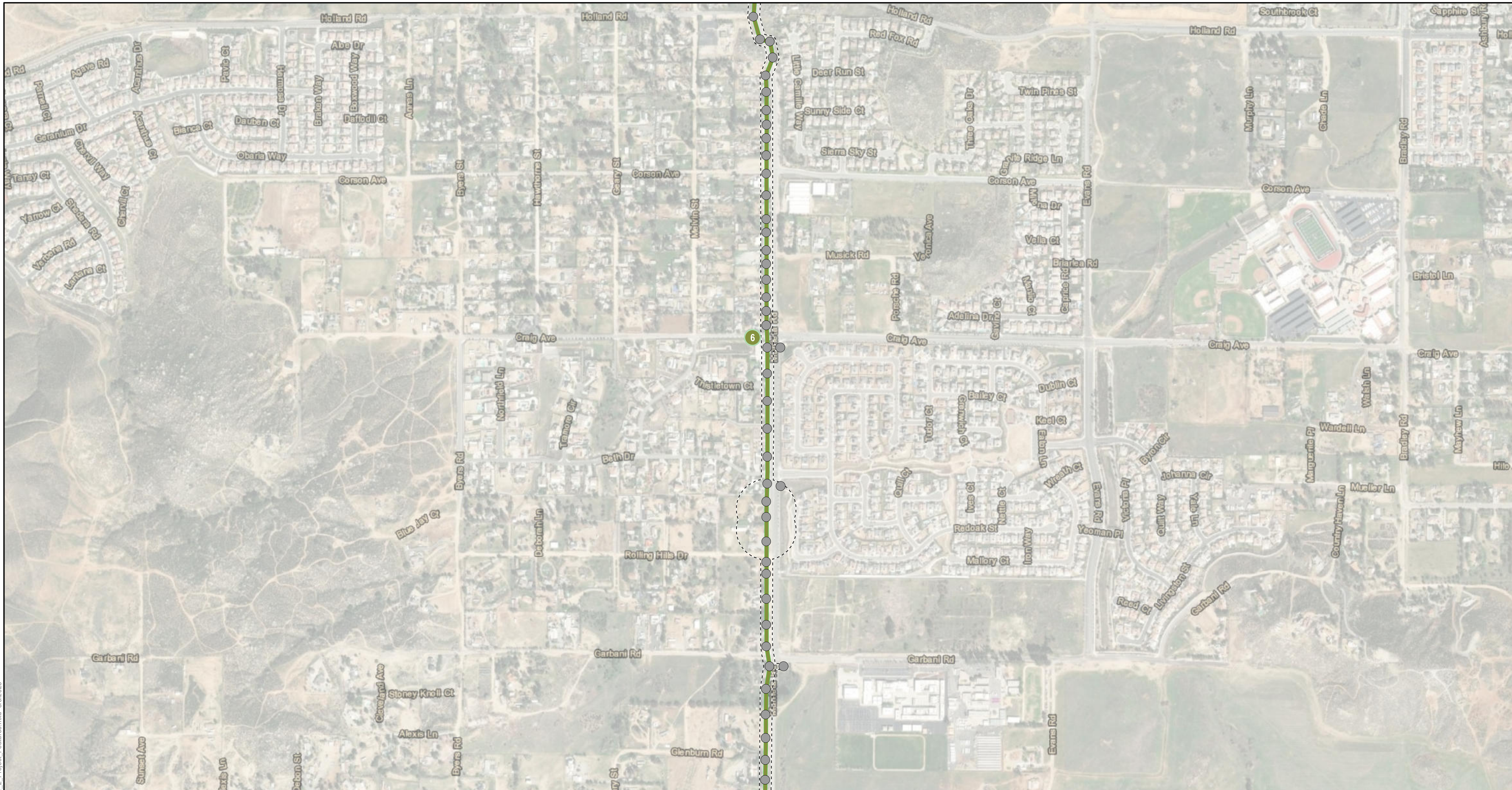

ASP Segment
New/Modify Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
115 kV General Disturbance Area

Figure 2-2k
Project Features

Alberhill System Project

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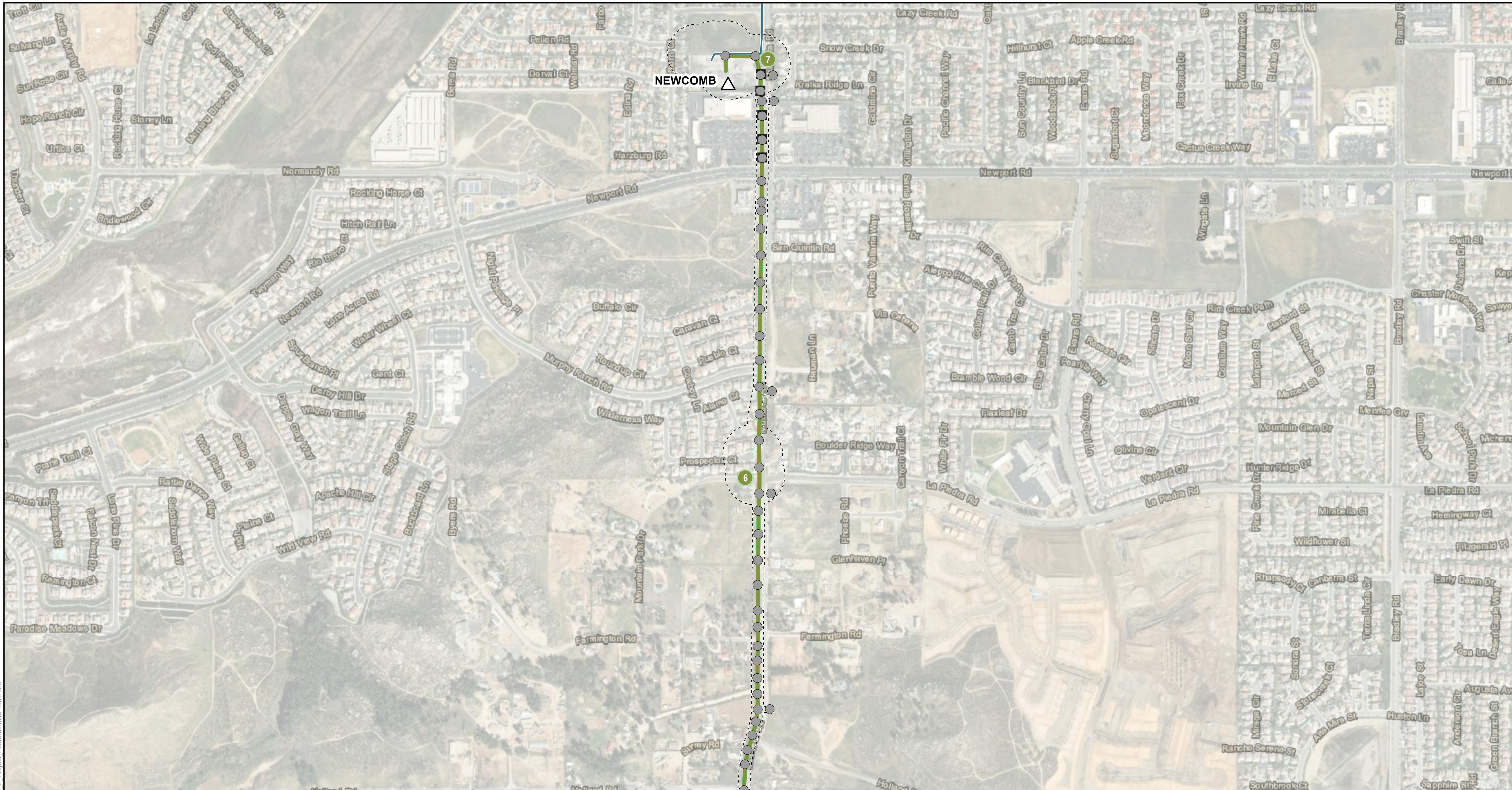

ASP Segment
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Existing Overhead 115 kV Subtransmission Line
Existing Substation
115 kV General Disturbance Area

Figure 2-2l
Project Features

Alberhill System Project

Feet
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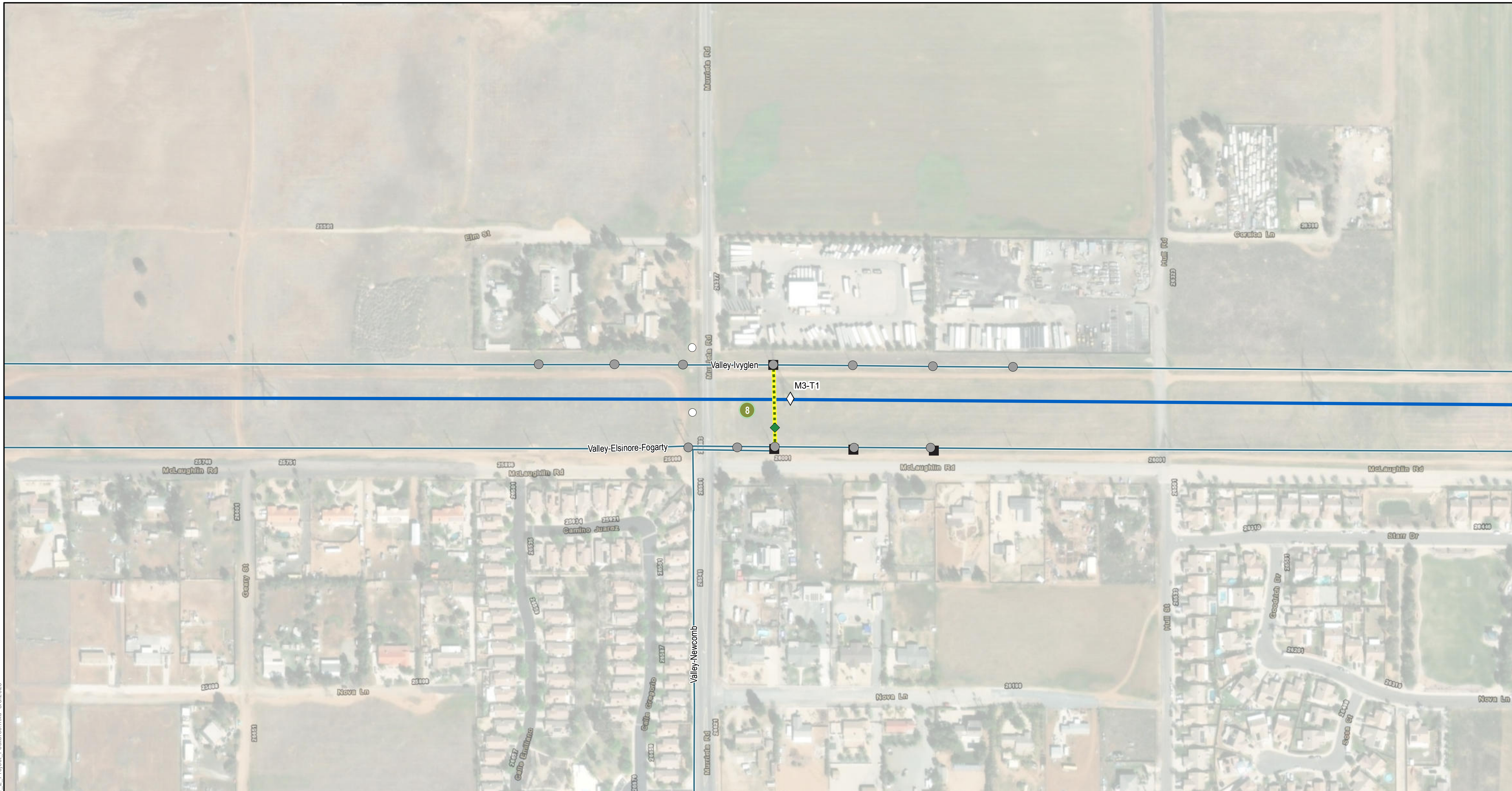

ASP Segment

Existing 500 kV Tower

Existing Overhead Serrano-Valley 500 kV Transmission Line

Existing Pole/Structure

New/Modify Pole/Structure

Remove Pole/Structure

Proposed 115 kV Cable in New Underground Duct Bank

Existing Overhead 115 kV Subtransmission Line

New 115 kV Underground Vault

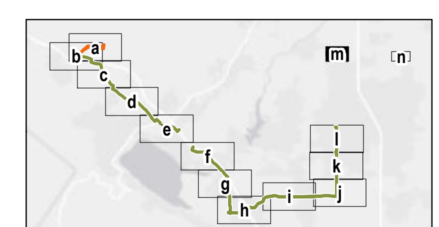

Figure 2-2m
Project Features

Alberhill System Project

0 100 200 Feet

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Existing Overhead Serrano-Valley 500 kV Transmission Line

Existing Overhead 115 kV Subtransmission Line

Staging Area

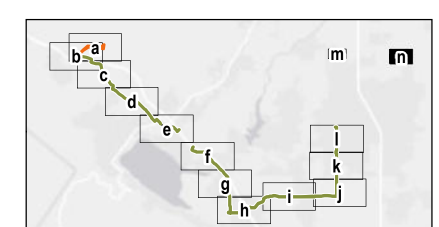

Figure 2-2n
Project Features

Alberhill System Project

0 100 200 Feet

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- Construction of an approximately 120-foot microwave antenna tower at the proposed Alberhill Substation site; installation of microwave telecommunications dish antennas at the proposed Alberhill Substation, the existing Santiago Peak Communications Site, and Serrano Substation; and other telecommunications equipment installations at existing and proposed substations; ~~and~~

- Installation of a new position inside Newcomb Substation to accommodate the new Newcomb-Skylark 115 kV line, and modification to an existing position at Valley Substation to isolate the existing Valley-Newcomb 115 kV line which will be taken out of service as part of the Proposed Project; and

- Transfer of 5 of the 14 Valley South 115-kV System substations to the proposed Alberhill 115-kV System: the Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb 115/12-kV substations.

The applicant estimates that construction of the proposed Alberhill Project would take approximately ~~28~~ 30 months. It is anticipated that the proposed Alberhill Project would be operational by ~~Q4 2020.spring or summer 2019~~Q2 2029 ~~spring or summer 2019~~. Figure 2-3 presents a technical schematic of the existing and proposed systems.

2.2 LOCATIONS OF THE PROPOSED PROJECTS

The applicant proposes to construct ~~both of~~ the ~~proposed projects~~ Proposed Project within unincorporated and incorporated areas of western Riverside County. This section summarizes the various jurisdictions that both proposed ~~project~~projects' components would traverse.

~~2.2.1 Valley–Ivyglen Project Location~~

~~From the existing Valley Substation, in the City of Menifee, the proposed 115-kV line would traverse in a generally west direction through areas within the City of Menifee, City of Perris, City of Lake Elsinore, and unincorporated areas of western Riverside County to the existing Ivyglen Substation (Figure 2-1).~~

~~The proposed route would cross Interstate 215 (I-215), State Route 74 (SR-74), and Interstate 15 (I-15). Fiber optic lines would be installed overhead on the proposed structures and underground in new and existing conduits.~~

2.2.2 Alberhill Project Location

The Alberhill Substation is proposed to be built on ~~34~~39 to ~~40~~44 acres of a 124-acre property located north of I-15 and the intersection of Temescal Canyon Road and Concordia Ranch Road in unincorporated western Riverside County (Figure 2-1).[~~3~~4] The two new 500-kV transmission lines would each extend approximately 1.5 miles northeast to connect the proposed Alberhill Substation to the existing Serrano–Valley 500-kV Transmission Line. The two 500-kV transmission lines would be constructed primarily in unincorporated Riverside County, although the transmission lines would pass through the City of Lake Elsinore.

The proposed 115-kV line modifications and construction would occur southeast from the proposed Alberhill Substation to Skylark Substation (approximately 11.5 miles) and from Skylark Substation to

[~~3~~4] If the applicant elects to excavate 5.2 acres of land adjacent to the northeast corner of the proposed substation site to obtain fill required for grading under Import Soil Option 1, then the land required for construction of the proposed substation would increase from ~~34~~39 acres to approximately ~~40~~44 acres (Section 2.4.6.2). This area also includes permanently graded areas around the permanent substation wall and areas that would contain portions of the 500-kV transmission line and 115-kV Segments ASP1 and ASP1.5.

Newcomb Substation (approximately 9 miles). The subtransmission lines would be modified or constructed in unincorporated Riverside County and in the Cities of Lake Elsinore, Wildomar, and Menifee.

Fiber optic lines would be installed overhead on many of the structures modified or constructed as part of the proposed Alberhill Project. In a few locations, fiber optic lines would also be installed in a new or existing underground conduit. Telecommunications equipment would be installed within the telecommunications rooms at the applicant's Barre, Fogarty, Ivyglen, Mira Loma, Newcomb, Serrano, Skylark, Tenaja, Valley, and Walnut Substations (Figure 1-1). Telecommunications systems would also be upgraded at the Box Springs Communications Site, which is located northwest of the City of Moreno Valley, California, and the applicant's Irvine Operations Center in southeastern Irvine, California.

One new approximately 120-foot microwave antenna tower would be installed at the proposed Alberhill Substation; one new microwave dish antenna would be installed at Serrano Substation in the City of Orange in Orange County; and two new dish antennas would be installed at the Santiago Peak Communications Site, which is located on land managed by the United States Forest Service within the Cleveland National Forest.

2.3 COMPONENTS OF THE PROPOSED PROJECTS

This section details the various components of the proposed projects.

~~2.3.1 Components of the Proposed Valley–Ivyglen Project~~

~~The components of the proposed Valley–Ivyglen Project are summarized in Table 2-1. Locations of the proposed Valley–Ivyglen Project's components are shown on Figures 2-2a through 2-2d, 2-2f, and 2-2i. Structures and underground conduit are shown in Figure 2-4.~~

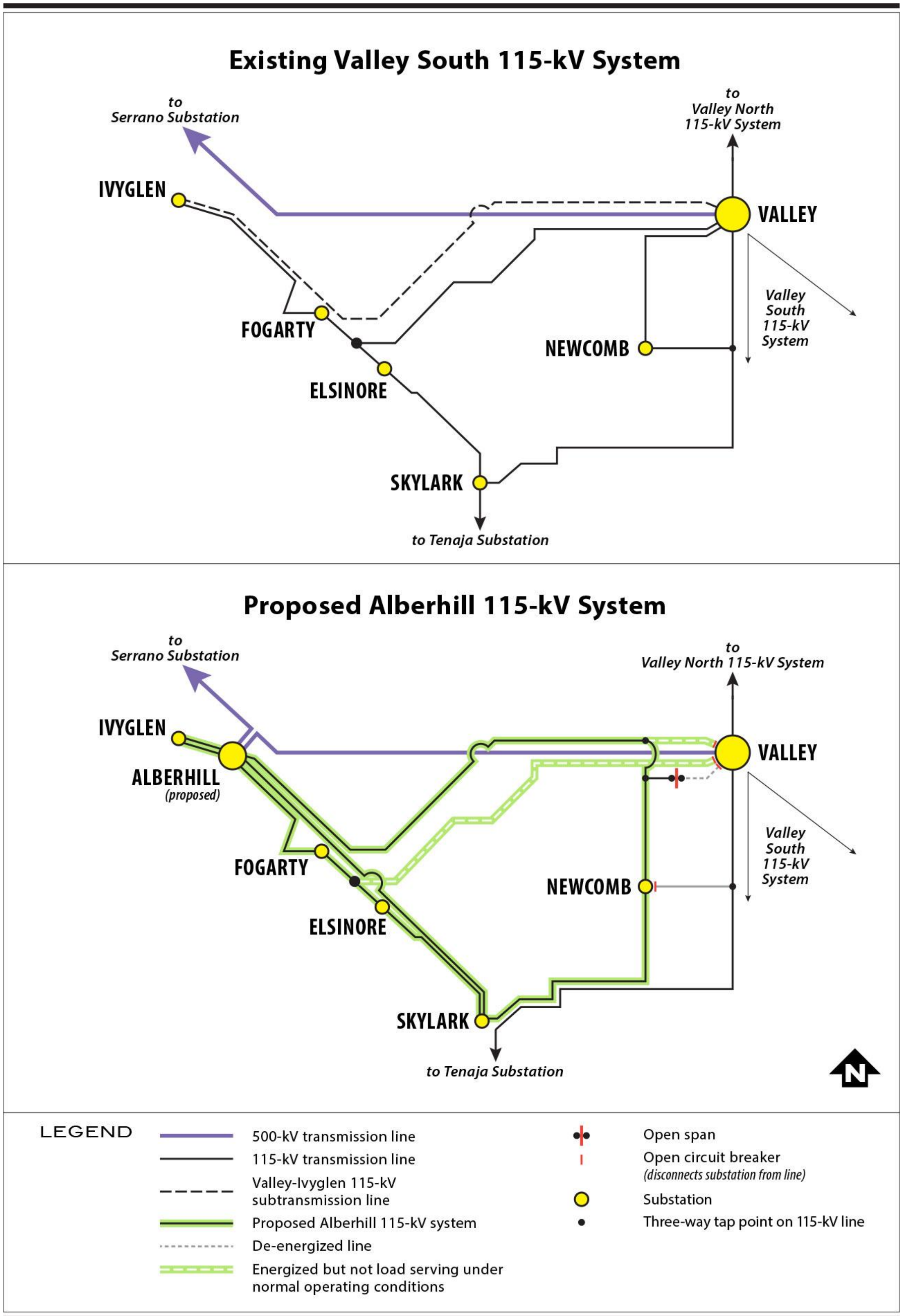
~~The applicant provided approximate structure locations (Figures 2-2a through 2-2d, 2-2f, and 2-2i). Although it is assumed the structures would be installed, in general, within the linear orientation of the proposed Valley–Ivyglen 115-kV line route, final engineering has not been completed. For the purposes of this analysis, it is assumed that the proposed 115-kV structures could be installed anywhere along the proposed route.~~

~~Span length would range between 80 feet and 1,000 feet in some locations to minimize impacts on various resources.~~

~~2.3.1.1 115-kV Subtransmission Lines (Segments VIG1 through VIG8)~~

~~The proposed Valley–Ivyglen Project would involve the construction of a new 115-kV subtransmission line. The route of the proposed Valley–Ivyglen 115-kV line is identified as Segments VIG1 through VIG8 on Figures 2-2a through 2-2d, 2-2f, and 2-2i. Wood poles, guy poles, lightweight steel (LWS) poles, hybrid poles, tubular steel poles (TSPs), underground duct banks and underground vaults would be used for construction of the new 115-kV subtransmission lines (Figure 2-4).~~

Figure 2-3 Technical Schematic of Existing and Proposed Systems



~~Table 2-1 Components of the Proposed Valley–Ivyglen Project~~

~~Component~~	~~Approximate Quantity~~	~~Dimensions/Specifications~~
~~Subtransmission Line Segments (Overhead and Underground)~~		
~~Segment VIG1: New single-circuit 115-kV subtransmission line~~	• ~~145 LWS poles~~ • ~~20 TSPs / riser poles (a)~~ • ~~1 underground vaults (b)~~	• ~~7.5 miles (300 feet new underground conduit)~~ • ~~30-foot-wide existing ROW on northern side of existing 260- to 390-foot-wide ROW~~
~~Segment VIG2: New single-circuit 115-kV subtransmission line~~	• ~~118 LWS poles~~ • ~~2 TSPs~~ • ~~18 guy poles (c)~~	• ~~4.2 miles~~ • ~~20- to 50-foot-wide new ROW (4.2 miles), partially within existing distribution-line ROW (d)~~
~~Segment VIG3: New single-circuit 115-kV subtransmission line along~~	• ~~28 LWS poles~~ • ~~6 TSPs~~ • ~~2 guy poles~~ • ~~1 wood pole~~	• ~~1.0 mile~~ • ~~30-foot-wide new ROW (1.0 mile), partially within existing distribution-line ROW (d)~~
~~Segment VIG4: New single-circuit 115-kV subtransmission line~~	• ~~2 wood poles~~ • ~~63 LWS poles~~ • ~~8 TSPs~~ • ~~4 hybrid poles (e)~~ • ~~3 guy poles~~	• ~~2.5 miles~~ • ~~30-foot-wide new ROW (0.3 miles), partially within existing distribution-line ROW (d)~~
~~Segment VIG5: New single-circuit 115-kV subtransmission line~~	• ~~1 wood poles~~ • ~~100 LWS poles~~ • ~~49 TSPs~~	• ~~5.11 miles~~ • ~~30- to 60-foot-wide new ROW (3.9 miles), partially within existing distribution and 115-kV ROW (d, f)~~
~~Segment VIG6: New single-circuit 115-kV subtransmission line~~	• ~~30 LWS poles~~ • ~~12 TSPs~~ • ~~3 guy poles~~	• ~~1.83 miles~~ • ~~30-foot-wide new ROW (1.1 miles), partially within existing distribution and 115-kV ROW (d, f)~~
~~Segment VIG7: New single-circuit 115-kV subtransmission line~~	• ~~10 wood poles~~ • ~~30 LWS poles~~ • ~~20 TSPs~~ • ~~10 wood shoofly poles (temporary)~~ • ~~1 Riser~~	• ~~2.3 miles (h)~~ • ~~30-foot-wide new ROW (1.8 miles), partially within existing distribution and 115-kV ROW (d, f)~~
~~Segment VIG8: New single-circuit 115-kV subtransmission line~~	• ~~2 wood poles~~ • ~~4 TSPs / riser poles (g)~~ • ~~8 underground vaults~~	• ~~1.9 miles~~ • ~~10- to 30-foot-wide new ROW (1.9 miles)~~

~~Component~~	~~Approximate Quantity~~	~~Dimensions/Specifications~~
~~Modifications at Existing Substations~~		
~~New telecommunications equipment installed at Valley and Ivyglen substations~~	~~n/a~~	~~n/a~~
~~New circuit breakers, disconnect switches, and one dead-end structures installed at Valley and Ivyglen substations~~	~~Valley Sub: Equip existing vacant 115kV Position~~ • ~~(2) 115kV Circuit Breaker~~ • ~~(4) 115kV Disconnect Switches~~ ~~Ivyglen Sub: Equip existing vacant 115kV Position~~ • ~~115kV Circuit Breaker~~ • ~~115kV Disconnect Switches~~	~~n/a~~
~~Totals~~		
~~New 115-kV subtransmission line~~	~~n/a~~	• ~~26.4 miles (1.9 miles in new underground conduit, 0.0 miles in existing underground conduit) (g)~~
~~Fiber optic line~~	~~n/a~~	• ~~26.1 miles (1.9 miles in new underground conduit, 2.5 miles in existing underground conduit)~~
~~New ROW to be acquired~~	~~n/a~~	• ~~23 miles (10 to 60 feet wide)~~
~~Maximum number of overhead structures that would be installed by structure type (h)~~	• ~~16 wood poles installed~~ • ~~514 LWS poles installed~~ • ~~121 TSPs installed~~ • ~~4 hybrid poles installed~~ • ~~26 guy poles~~ • ~~1 riser~~	• ~~35 to 100 feet tall, 1.5 to 2.5 feet in diameter at ground level~~ • ~~65 to 115 feet tall, 1.5 to 2.5 feet in diameter at ground level~~ • ~~80 to 135 feet tall,(i) 5 to 8 feet in diameter at ground level (including foundation)~~ • ~~75 to 80 feet tall, 5 to 6 feet in diameter at ground level~~ • ~~40 to 60 feet tall, 1 to 2 feet in diameter at ground level~~
	~~682 overhead structures permanently installed~~ ~~10 wood shoofly poles temporarily installed~~	• ~~75 to 100 feet tall, 1.5 to 2.5 feet in diameter at ground level~~
~~Number of vaults installed (h)~~	~~9 underground vaults installed~~	~~Excavated pit would be 12 feet wide by 24 feet long by 14 feet deep~~
~~Number of overhead structures removed (h)~~	• ~~280 wood distribution-line poles removed (d)~~ • ~~90 wood subtransmission-line poles removed (f)~~	• ~~12-kV poles: 30 to 80 feet tall, 0.7 to 1.6 feet in diameter at ground level~~

~~Component~~	~~Approximate Quantity~~	~~Dimensions/Specifications~~
	~~370 structures removed~~	• ~~33-kV poles: 30 to 65 feet tall, 0.8 to 1.6 feet in diameter at ground level~~ • ~~35 to 90 feet tall, 0.8 to 2 feet in diameter at ground level~~

~~Sources: SCE 2013, 2014~~

~~Key: kV = kilovolt, LWS = lightweight steel, n/a = not applicable, ROW = right-of-way, TSP = tubular steel pole Notes:~~

~~a At each end of the proposed underground 115-kV line, the conductor would rise out of the ground up a riser pole. The proposed riser poles would be TSPs.~~

~~b Vaults are below-grade concrete enclosures where underground electrical or telecommunications lines terminate, are spliced together, or transition to or from overhead positions. During operations, vaults are used to access underground lines for inspection, maintenance, and repair.~~

~~c A guy pole is a pole to which a steel cable (a guy wire) is attached and extended to an adjacent LWS pole or other utility structure. Guy poles and guy wires are installed to add stability to a utility structure.~~

~~d Existing overhead electrical distribution lines would be relocated to and underbuilt on the proposed overhead 115-kV structures.~~

~~e The lower section of a hybrid pole (Figure 2-4) is composed of concrete and the upper section of steel. Hybrid poles are direct-buried into the ground (without poured-in-place foundations) in areas with corrosive soil conditions.~~

~~f In some areas, where the proposed route would follow an existing 115-kV ROW, the single-circuit 115-kV structures would be replaced with double-circuit 115-kV structures (e.g., along the temporary, shoofly line section of 115-kV Segments VIG7 and VIG8). In other areas (e.g., along sections of 115-kV Segment 5), the existing single-circuit 115-kV structures would remain in operation as currently configured. The precise number of existing 115-kV structures that would be converted into double-circuit structures would be determined during final engineering.~~

~~g The distance presented includes 0.5 miles of temporary 115-kV structures that would be installed as part of the shoofly construction proposed along 115-kV Segments VIG7 and VIG8, which are described in Section 2.4.5.4. The length of the new underground conduit (Figure 2-4) presented includes 525 feet of trenching for the replacement of 35 distribution-line riser poles.~~

~~h The numbers of structures and vaults to be installed may change based on final engineering.~~

~~i Two TSPs up to 135 feet tall would be needed along 115-kV VIG Segment 1 to span a cultural site. All other TSPs proposed along the segment would be up to 115 feet tall.~~

~~Each of the proposed 115-kV overhead structures would support polymer insulators, a 954-kcmil[5] stranded aluminum conductor (SAC), and a 336.4-kcmil stranded aluminum conductor steel-reinforced fault-return conductor. Grounding would be provided through a clamp attachment installed to the proposed metal 115-kV structures to bond the fault return conductor structures. The proposed wood and hybrid poles would have a 4/0 aluminum steel-reinforced conductor installed for grounding. The normal rating (in clear atmospheric conditions, with an ambient temperature of 104 degrees Fahrenheit, at an elevation of 500 feet, and with a wind speed of 4 feet per second) of the proposed 954-kcmil conductor is 1,090 amps when in continuous operation. The emergency rating, assuming 4 hours of operation, is 1,470 amps. Under the same conditions, the normal rating of the proposed 336.4-kcmil fault-return conductor is 605 amps and emergency rating is 820 amps.~~

~~*115-kV Segment VIG1*~~

~~The 115-kV Segment VIG1 would exit the Valley Substation from the southwest and extend west along the north side of the existing Serrano–Valley 500-kV Transmission Line ROW to SR-74. The segment would span I-215, SR-74, and a number of roadways and cross through the City of Menifee, City of Perris, and unincorporated Riverside County. Approximately 0.5 mile west of the Valley Substation, a 300-foot portion of 115-kV Segment VIG1 would be installed in new underground duct banks. Portions of the existing distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures.~~

~~*115-kV Segment VIG2*~~

~~This segment would follow SR-74 south, passing from unincorporated Riverside County into the City of Lake Elsinore. The segment would then follow along the western side of SR-74 to Conard Avenue. Sections of 115-kV Segment VIG2 would follow an existing distribution line ROW, and in these areas, the existing distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures. A number of guy poles would be installed on the east side of SR-74 in locations where the proposed 115-kV structures require additional support (Figures 2-2c and 2-2d). Guy wires would span SR-74 between the proposed 115-kV structure and the guy poles.~~

~~*115-kV Segment VIG3*~~

~~This segment would cross SR-74 and follow Conard Avenue southeast to Third Street. It would follow Third Street southwest across I-15 and then continue southwest to Collier Avenue. 115-kV Segment VIG3 would follow an existing distribution line ROW, and the distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures. Guy poles would be installed in locations where the proposed 115-kV structures require additional support. Guy wires would span Third Street and Conard Street between the proposed 115-kV structure and the guy poles in several locations.~~

~~*115-kV Segment VIG4*~~

~~This segment would continue along Third Street from Collier Avenue southwest to Pasadena Avenue and then follow Pasadena Avenue northwest until the road ends. From there, it would pass over land to Riverside Drive (SR-74), extend southwest to Baker Street, and then follow Baker Street northwest to Pierce Street. It would pass under the Valley–Elsinore–Fogarty 115-kV line as it approaches Pierce Street.~~

[5] ~~A circular mil (cmil) is a standard unit of measure used for electrical systems that refers to the area of the cross section of larger conductor sizes. One cmil is equal to the area of a circle with a 1-mil diameter, and 1 kcmil is equal to 1,000 cmils. Large conductor sizes rated for use on electrical transmission lines are generally 0.6 inches to 2 inches in diameter. Aluminum steel-reinforced 2,156-kcmil conductor is approximately 1.8 inches in diameter. In general, larger diameter conductor is capable of greater electrical carrying capacity than smaller diameter conductor (Grigsby 2001).~~

~~Sections of 115-kV Segment VIG4 would follow an existing distribution line ROW, and in these areas, the existing distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures. Guy poles would be installed in locations where the proposed 115-kV structures require additional support.~~

~~Additionally, approximately 600 feet of construction would occur along the Valley–Elsinore–Fogarty 115-kV line where the proposed Valley–Ivyglen 115-kV line would cross under the existing 115-kV line (Figure 2-2b) approximately 650 feet south of the Pierce Street and Baker Street intersection. Four Valley–Elsinore–Fogarty 115-kV line wood poles would be replaced with two new TSPs and two new wood poles.~~

~~*115-kV Segment VIG5*~~

~~This segment would continue from Pierce Street across Nichols Road and then extend west along Nichols Road to the abandoned section of Lake Street ("Old Lake Street"). It would extend northwest along Old Lake Street toward I-15. At this point, the applicant would construct the 115-kV line along Lake Street in one of two alignments—Utility Corridor Option or West of Lake Street Option:~~

- ~~Utility Corridor Option: Under this option, 115-kV Segment VIG5 would continue parallel to and east of Lake Street. The segment would continue north on the east side of Lake Street for about 900 feet.[6] The segment would then cross to the west side of Lake Street and continue north to approximately 800 feet south of Temescal Canyon Road then cross to the east side of Lake Street and continue north to the I-15 on- and off-ramps.~~

- ~~West of Lake Street Option: Under this option, 115-kV Segment VIG5 would cross Lake Street at its intersection with the abandoned portion of Old Lake Street. The segment would then continue parallel to and west of Lake Street. The segment would continue north on Lake Street to approximately 800 feet south of Temescal Canyon Road then cross to the east side of Lake Street and continue north to the I-15 on- and off-ramps for Lake Street.~~

~~From the east side of Lake Street, the segment would turn west along the south side of an I-15 off-ramp and then along both sides of Temescal Canyon Road for approximately 0.3 miles. From there, it would cross I-15 to the north and then continue west along Concordia Ranch Road to the proposed Alberhill Substation site. A number of guy poles would be installed in locations where the proposed 115-kV structures require additional support.~~

~~Structures along sections of the existing Fogarty–Ivyglen 115-kV line would be replaced and, in some cases, relocated along the existing ROW to allow for installation of the proposed Valley–Ivyglen 115-kV line. These sections, combined, would be approximately 0.5 miles long. Sections of 115-kV Segment VIG5 would follow existing distribution line ROWs, and in these areas, the existing distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures.~~

~~*115-kV Segment VIG6*~~

~~This segment would continue along Temescal Canyon Road west to Hostettler Road from where 115-kV Segment VIG5 crosses I-15. From there, it would extend over land northwest along I-15. Sections of 115-kV Segment VIG6 would follow an existing distribution line ROW or the 115-kV ROW. The existing~~

~~[6] This area east of Lake Street is the location of a planned utility corridor. The utility corridor has not yet been prepared to accommodate utilities. All necessary work, including relocation of a Temescal Wash tributary, would be as part of the Alberhill Ridge Specific Plan (a separate developer project from applicant's Valley–Ivyglen Project) prior to construction of the proposed Valley–Ivyglen Project if the applicant selects this option.~~

~~distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures. Existing single-circuit 115-kV structures would likely be replaced with 115-kV structures capable of supporting two circuits (i.e., double-circuit 115-kV structures), but this would be determined during final engineering.~~

~~*115-kV Segment VIG7*~~

~~This segment would cross Horse Thief Canyon Road and continue along De Palma Road for approximately 1.2 miles. From there, it would cross I-15 to the north and extend to Temescal Canyon Road. It would continue northwest on Temescal Canyon Road to a point approximately 700 hundred feet northwest of the intersection of Temescal Canyon Road and Indian Truck Trail. For approximately 0.5 miles prior to transitioning into 115-kV Segment VIG8, Segment VIG7 would be constructed within the existing Fogarty–Ivyglen 115-kV line ROW. The existing single-circuit 115-kV structures would be replaced with double-circuit 115-kV structures. Sections of 115-kV Segment VIG7 would follow existing distribution line ROWs, and the existing overhead distribution line would be relocated to an overhead position on a lower section of the new 115-kV structures. Approximately 0.5 miles of temporary 115-kV structures would be installed as part of the proposed shoofly construction activities described in Section 2.4.5.4.~~

~~*115-kV Segment VIG8*~~

~~This segment would continue northwest along Temescal Canyon Road from the end of 115-kV Segment VIG7 in a new underground conduit. It would be installed underground along Temescal Canyon Road, which crosses under I-15, to a point located across from Ivyglen Substation. From there, it would transition to an overhead position prior to entering the substation.~~

~~Vaults and duct banks would be installed along the proposed underground route. Vaults are below-grade concrete enclosures where underground electrical or telecommunications lines terminate, are spliced together, or transition to or from overhead positions. Two of the temporary 115-kV shoofly structures would be installed along 115-kV Segment VIG8.~~

~~2.3.1.2 Telecommunications~~

~~A new fiber optic line would be installed along the 115-kV Segments, as shown in Figures 2-5a through 2-5d, and as described below. Land disturbance estimates for the proposed trenching activities along all Valley–Ivyglen 115-kV segments are presented in Table 2-5.~~

~~*115-kV Segment VIG1*~~

~~Along 115-kV Segment VIG1, the fiber optic line would primarily be installed overhead on the proposed 115-kV structures, with the exception of the following proposed underground locations:~~

- ~~Approximately 2,530 feet in an existing underground conduit within Valley Substation;~~
- ~~Approximately 315 feet in a new underground conduit adjacent to Valley Substation; and~~
- ~~Approximately 1,331 feet in new underground conduit approximately 0.5 miles west of Valley Substation.~~

~~*115-kV Segment VIG2*~~

~~Along 115-kV Segment VIG2, a fiber optic line would primarily be installed overhead on the proposed 115-kV structures, with the exception of approximately 410 feet in a new underground conduit along SR-74 from Ethanac Road to Festus Circle.~~

~~*115-kV Segment VIG3*~~

~~Along 115-kV Segment VIG3, a fiber optic line would primarily be installed overhead on the proposed 115-kV structures with the exception of approximately 338 feet in a new underground conduit along Third Street and across Collier Avenue.~~

~~*115-kV Segment VIG4*~~

~~Along 115-kV Segment VIG4, the fiber optic line would primarily be installed overhead on the proposed 115-kV structures, with the exception of approximately 210 feet in a new underground conduit along Collier Avenue and Third Street, and approximately 200 feet in a new underground conduit along Baker Street southeast of Pierce Street.~~

~~*115-kV Segment VIG5*~~

~~Along 115-kV Segment VIG5, the fiber optic line would primarily be installed overhead on the proposed 115-kV structures, with the exception of approximately 613 feet in an existing underground conduit across Nichols Road to Old Lake Street.~~

~~*115-kV Segment VIG6*~~

~~Along 115-kV Segment VIG6, the fiber optic line would be installed overhead on the proposed 115-kV structures.~~

~~*115-kV Segment VIG7*~~

~~Along 115-kV Segment VIG7, the fiber optic line would primarily be installed overhead on the proposed 115-kV structures, with the exception of approximately 1,330 feet in a new telecommunications underground conduit along De Palma Road east of the intersection of Campbell Ranch Road and Santiago Canyon Road.~~

~~*115-kV Segment VIG8*~~

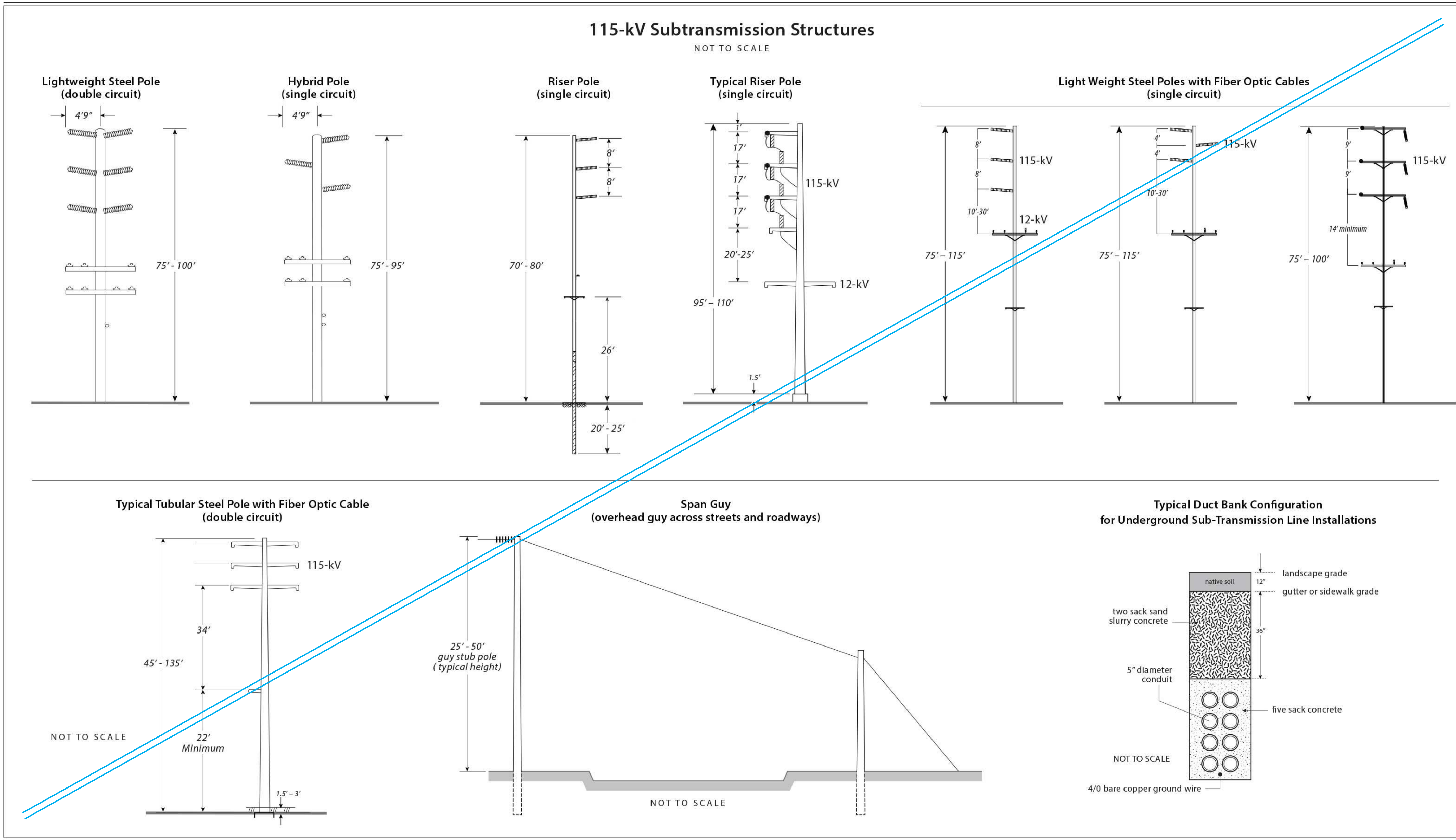
~~Along 115-kV Segment VIG8, the fiber optic line would primarily be installed underground along this segment. Approximately 10,670 feet of fiber optic cable would be installed in an existing underground conduit along Campbell Ranch Road, beginning approximately 850 feet east of Santiago Canyon Road, to Ivyglen Substation. An additional approximately 1,497 feet of fiber optic cable would be installed in a new underground conduit along Temescal Canyon Road from Campbell Ranch Road to Ivyglen Substation.~~

~~2.3.1.3 Access Roads~~

~~The proposed Valley–Ivyglen Project includes widening and creation of a total of approximately 14 miles of roads. The new access roads could be located anywhere within the Valley–Ivyglen 115-kV General Disturbance Area (Figures 2-6a through 2-6d). The drivable area of the proposed access roads would generally be 24 feet wide with an additional 2 feet on each side if drainage berms or swales are required.[67] In addition, hilly terrain along sections of 115-kV Segments VIG1 and VIG6 may require additional permanent and temporary disturbance areas for vehicle turnaround and positioning during access road construction. In some locations, the permanent, graded disturbance areas may be as wide as 100 feet, and the temporary disturbance areas may be as wide as 200 feet. The access roads constructed to~~

[67] ~~Berms are low earthen walls constructed to help retain and direct surface water runoff. Swales are depressions that collect surface water runoff.~~

~~Figure 2-4 Subtransmission Structures and Underground Duct Bank Configuration~~



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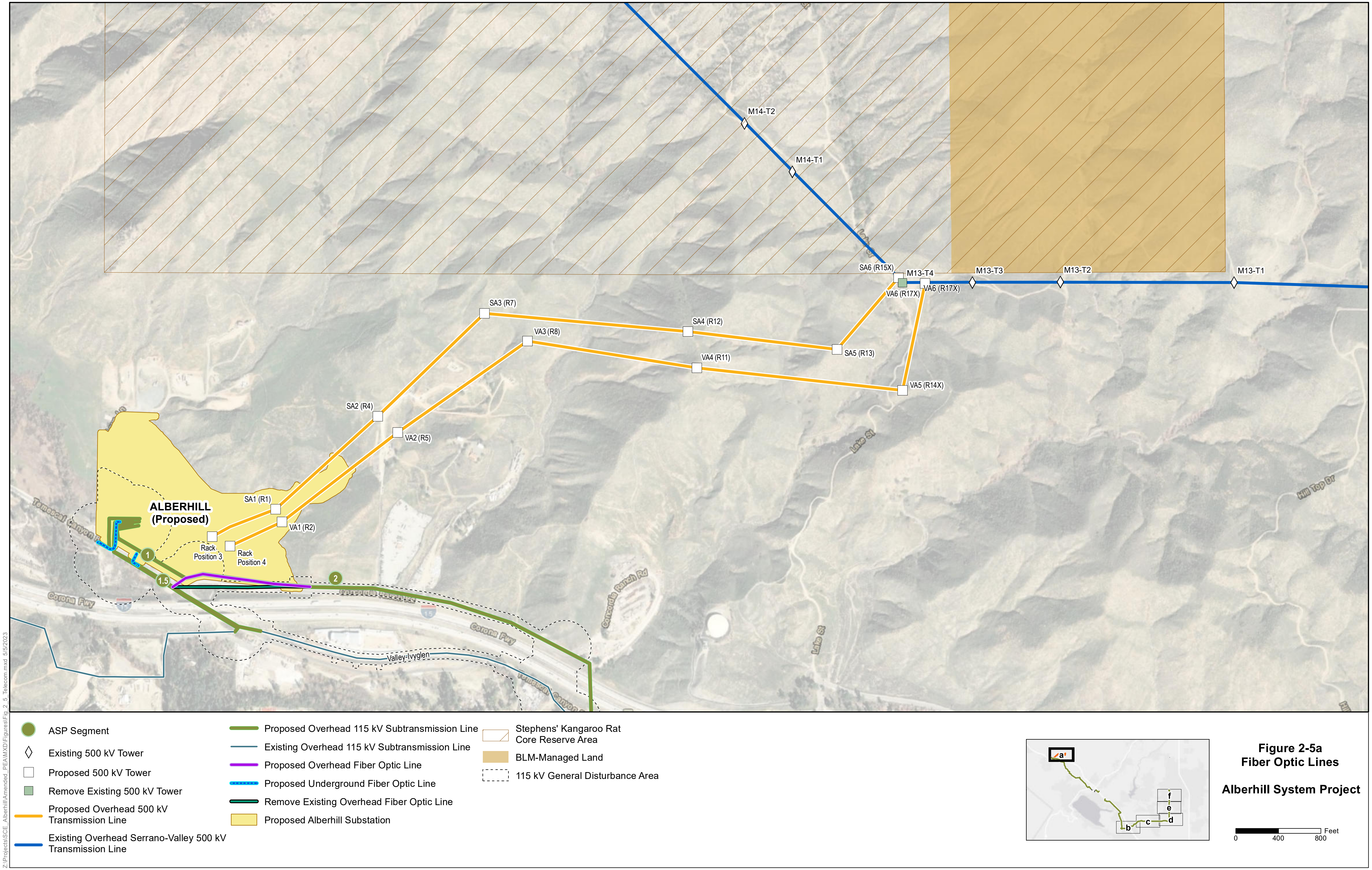
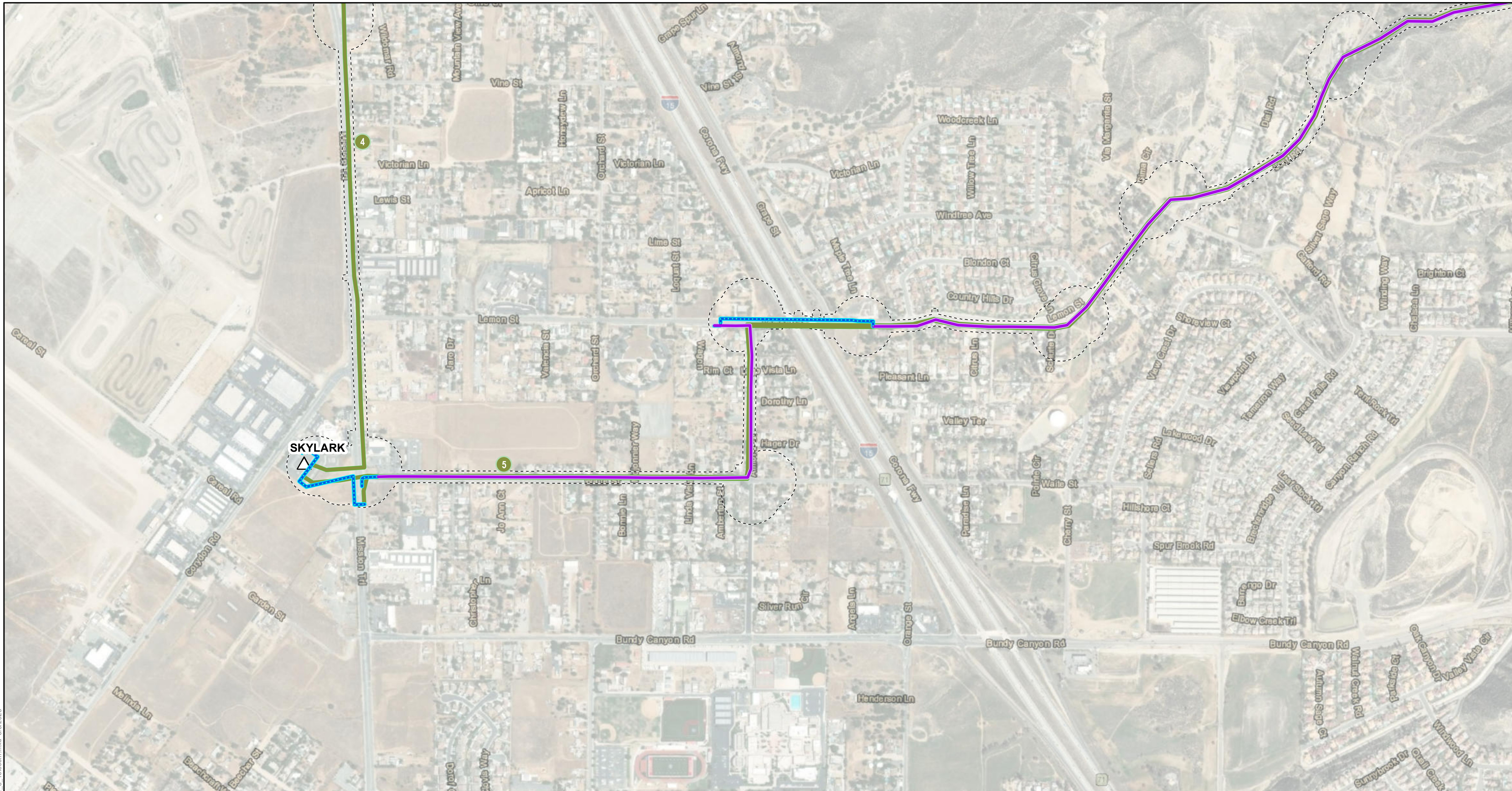


Figure 2-5a
Fiber Optic Lines

Alberhill System Project



ASP Segment	Proposed Overhead 115 kV Subtransmission Line	Existing Substation
	Proposed Overhead Fiber Optic Line	115 kV General Disturbance Area
	Proposed Underground Fiber Optic Line	

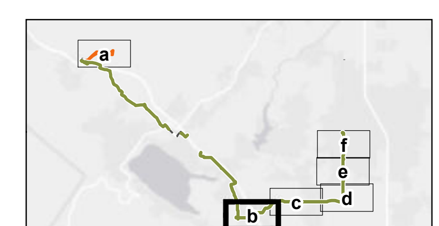


Figure 2-5b
Fiber Optic Lines

Alberhill System Project

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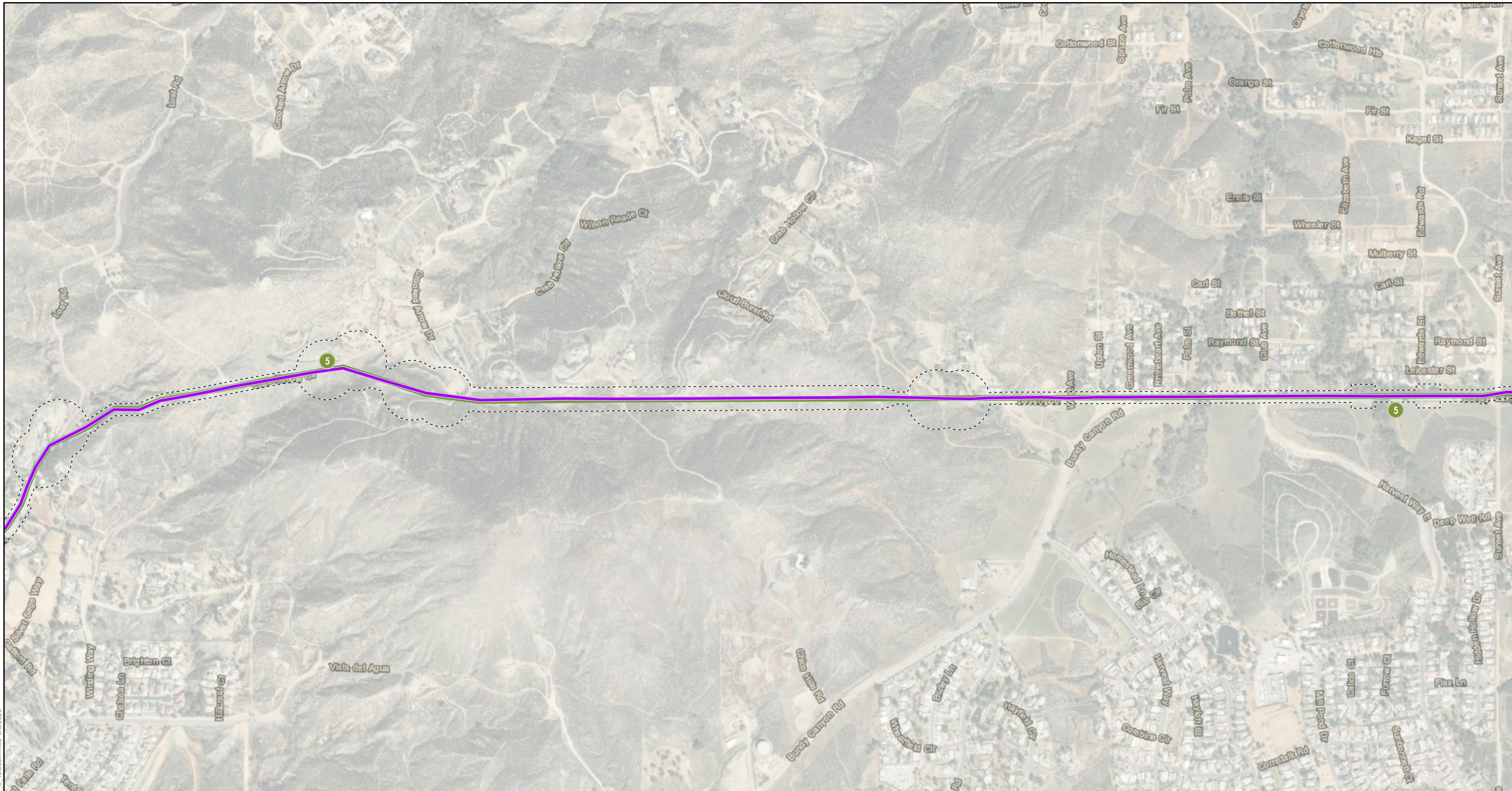

ASP Segment

Proposed Overhead 115 kV Subtransmission Line

Proposed Overhead Fiber Optic Line

115 kV General Disturbance Area

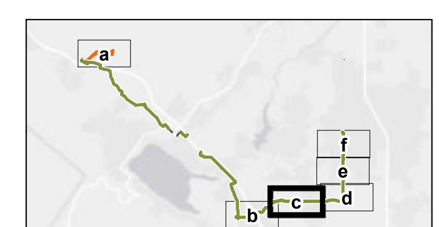

Figure 2-5c
Fiber Optic Lines

Alberhill System Project

Feet
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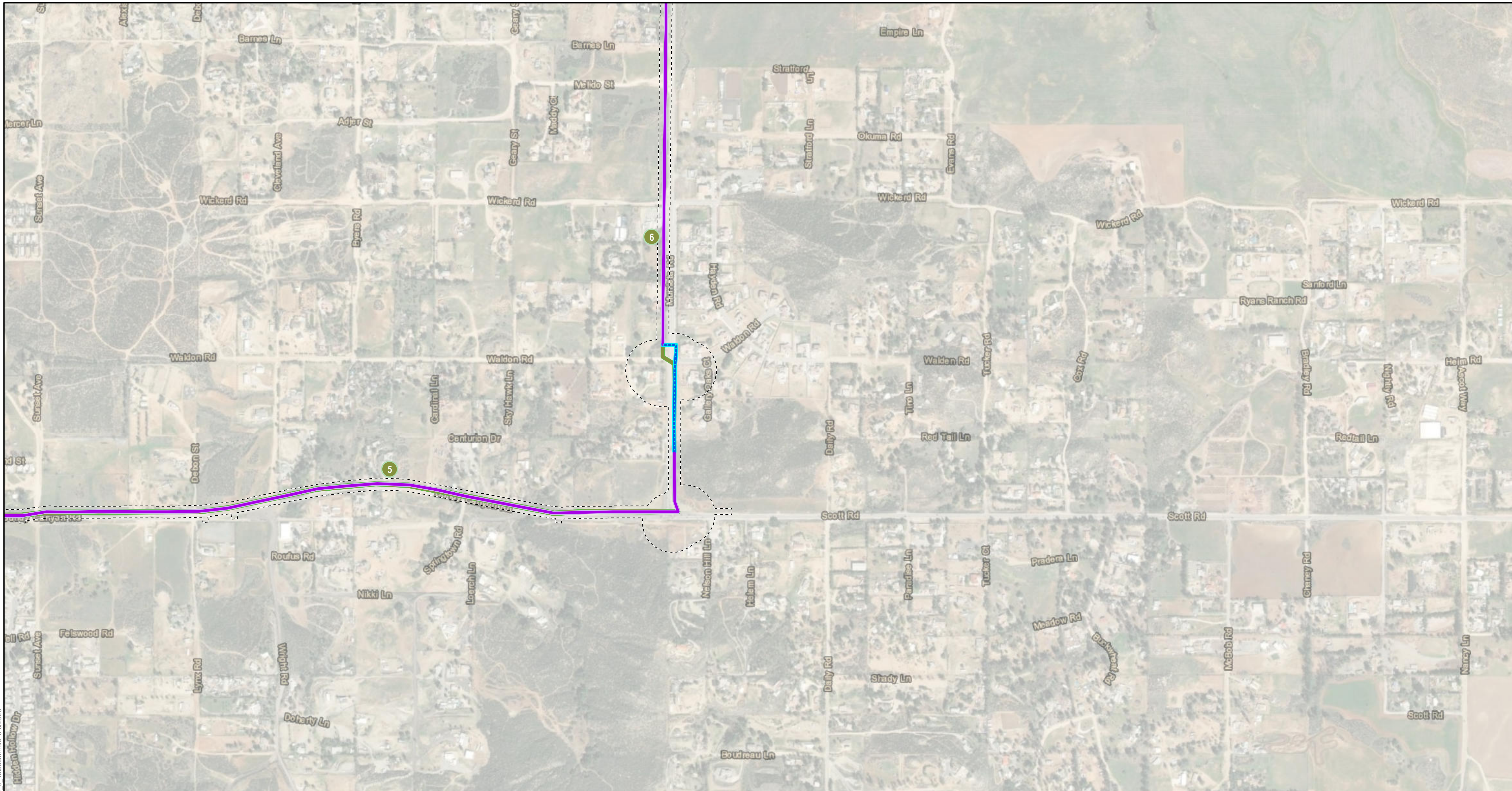

ASP Segment

Proposed Overhead 115 kV Subtransmission Line

Proposed Overhead Fiber Optic Line

Proposed Underground Fiber Optic Line

115 kV General Disturbance Area

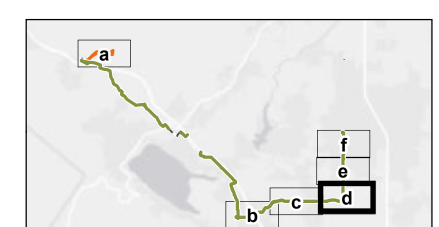

Figure 2-5d
Fiber Optic Lines

Alberhill System Project

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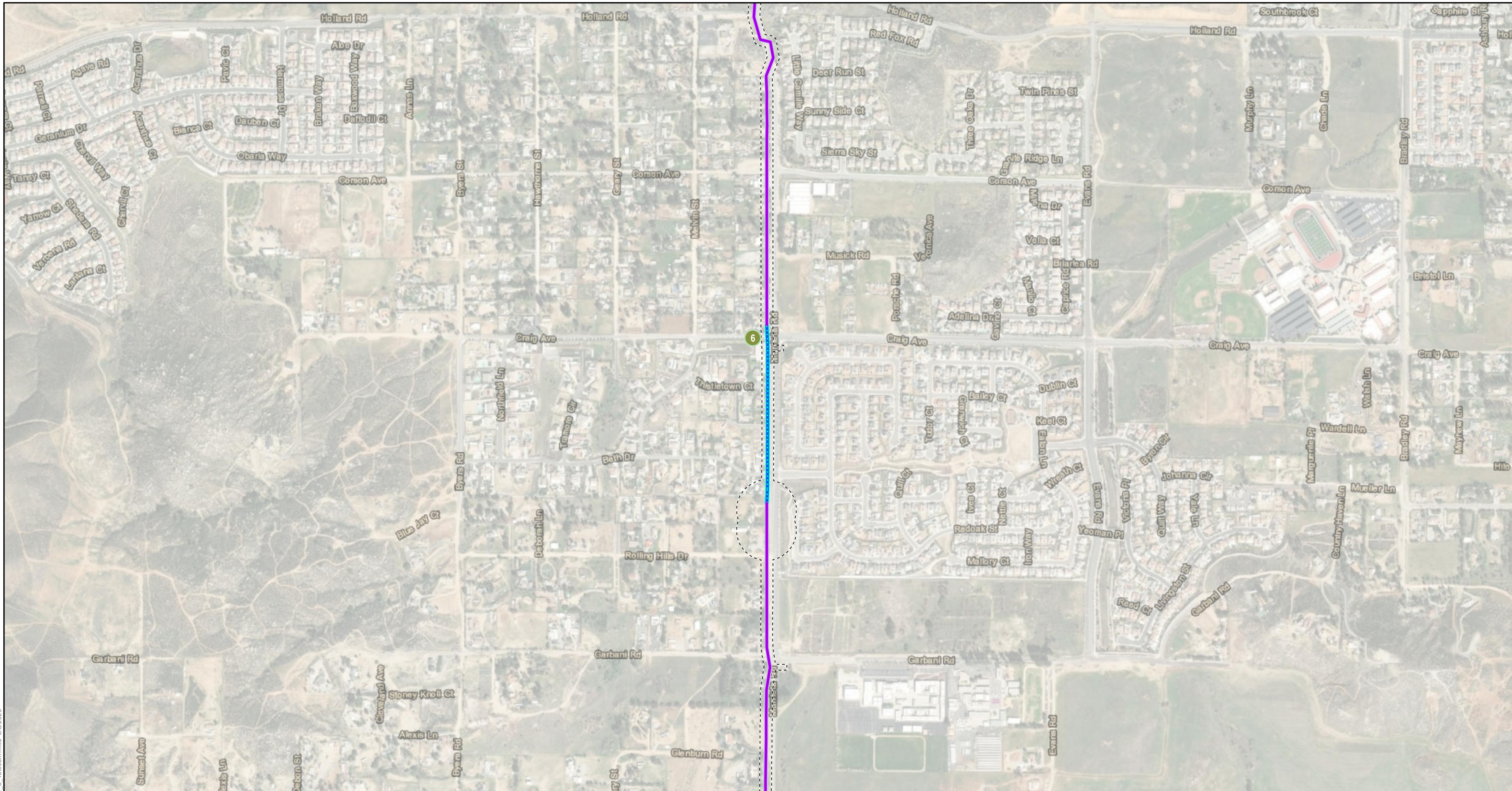

ASP Segment

Proposed Overhead 115 kV Subtransmission Line

Proposed Overhead Fiber Optic Line

Proposed Underground Fiber Optic Line

115 kV General Disturbance Area

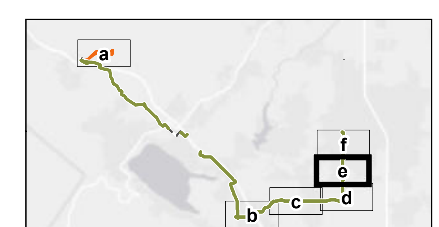

Figure 2-5e
Fiber Optic Lines

Alberhill System Project

0 400 800 Feet

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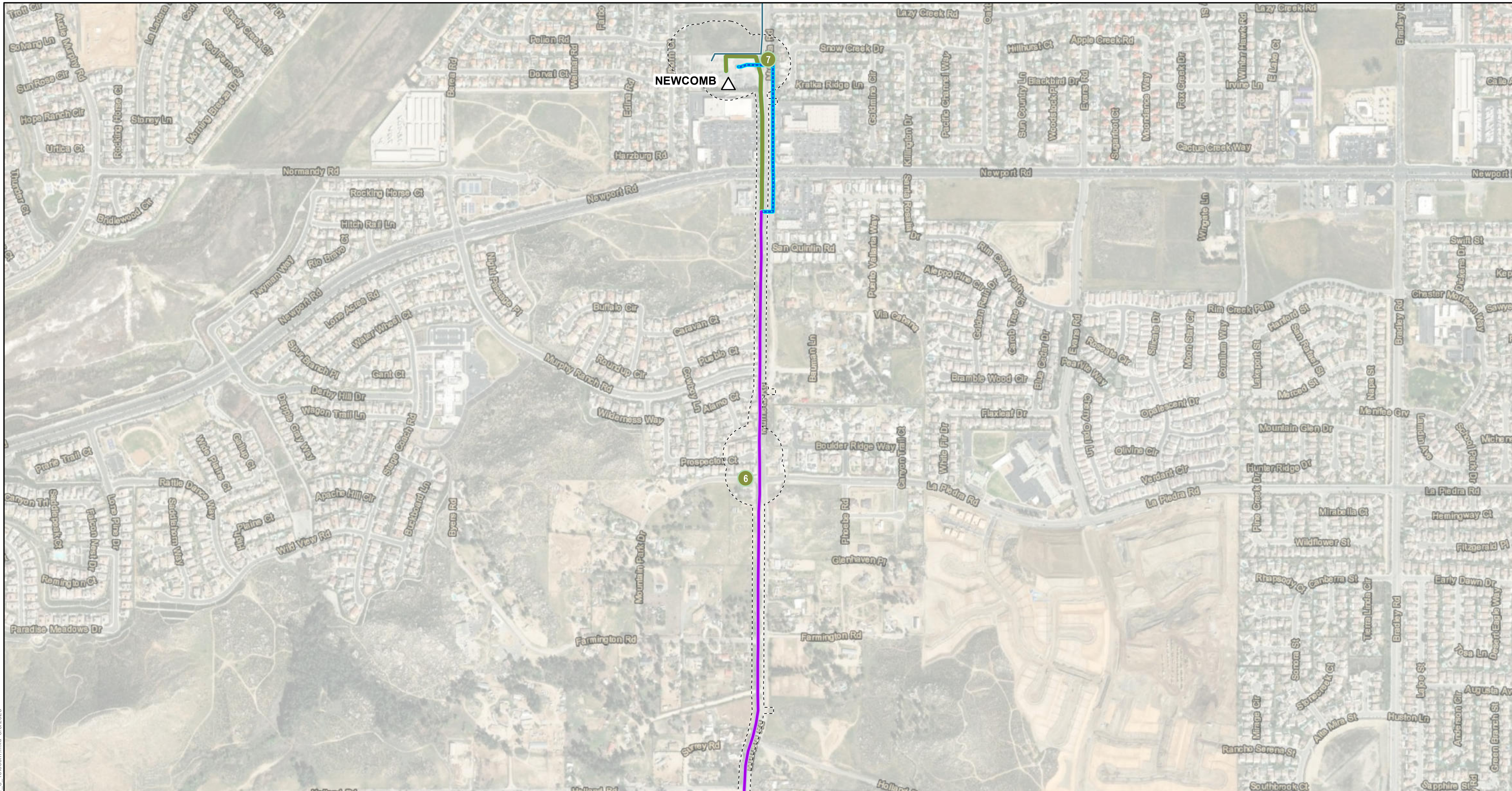

● ASP Segment	Proposed Overhead 115 kV Subtransmission Line	△ Existing Substation	
	Existing Overhead 115 kV Subtransmission Line	115 kV General Disturbance Area	
	Proposed Overhead Fiber Optic Line		
	Proposed Underground Fiber Optic Line		

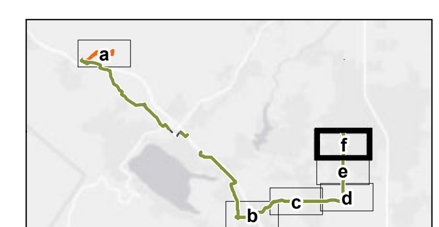

Figure 2-5f
Fiber Optic Lines

Alberhill System Project

0 400 800 Feet

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~~accommodate construction would be permanent. They would be maintained after construction to facilitate future access for operations and maintenance purposes. Excess soil and vegetation from access road construction would be distributed within the permanent, graded disturbance areas adjacent to the proposed access roads or disposed of as described in Section 2.4.4.8. Refer to the disturbance calculations in Table 2-5 for additional detail related to access road construction.~~

~~2.3.1.4 Valley and Ivyglen Substation Telecommunications Modifications~~

~~At Valley Substation, a 19-inch wide rack would be installed in the existing communications room to hold the telecommunications equipment. The communications and control rooms would have conduits for fiber optic cables and conduits to protect relaying equipment. At Ivyglen Substation, minor additions to existing channel equipment would be made.~~

2.3.2 Components of the Proposed Alberhill Project

The components of the proposed Alberhill Project are summarized in Table 2-2 and shown on Figure 2-2a through 2-~~2c, 2-2e, and 2-2g through 2-2i~~2n.

2.3.2.1 Alberhill Substation

The proposed 1,120 MVA 500/115 kV Alberhill Substation would ~~be expandable to a maximum of 1,680 MVA,~~ be initially equipped with ~~space for three~~two in-service 560 MVA 500/115 kV transformers ~~and~~ with space for one ~~spare, depending on~~ future ~~need~~on-site spare transformer. Up to five 500 kV transmission lines may connect to the final build of the substation, as needed. The substation would be unstaffed and automated. The ~~initial build of the~~ proposed Alberhill Substation would connect to an existing 500-kV transmission line via new segments and include the following (Figure 2-7):

- Two 560 MVA 500/115 kV transformers with one used as ~~a~~an energized spare;
- 500 kV switchrack with ~~gas~~air-insulated switchgear;
- 115 kV switchrack;
- 115 kV capacitor bank;
- Control building ~~with basement~~;
- Electrical power sources including a backup generator;
- Lighting;
- Entrance, gates, driveways, parking, and a perimeter wall that is a minimum of 8 feet tall and a maximum of 14 feet tall; and
- Restroom, septic system, water supply, and landscaping irrigation.

Five 115 kV lines would extend from the initial build of the proposed Alberhill Substation. If the proposed substation is expanded in the future ~~and two or up to three load-serving 500/115 kV transformers are installed, up to 10~~, up to 11 115 kV lines may ultimately extend from the proposed substation. To allow for construction of the substation, a 27-inch agricultural water pipeline would be relocated to the perimeter of the proposed Alberhill Substation property (Figure 2-7).

Transformers

The proposed Alberhill Substation would include the installation of two 560 MVA 500/115 kV transformers ~~as part of the initial build~~, one as load-serving and one as an energized spare. There would also be a location for one additional future transformer. Because the total load that would be transferred initially from the Valley Substation to the proposed Alberhill Substation would be less than the capacity of one of the installed transformers (560 MVA), the second transformer would be energized and available for service as the spare for the purposes of the initial build.

Table 2-2: Components of the Proposed Alberhill Project

Component	Approximate Quantity	Approximate Dimensions/Specifications
Alberhill Substation		
New 1,120 MVA 500/115 kV substation ~~expandable to 1,680 MVA~~	• Up to ~~three 500~~two 560 MVA transformers in service ~~and~~with space for one spare transformer[a]	• ~~34~~39 to ~~43~~44 acres[b] • ~~33,550~~Approximately 34,500 gallons of oil per transformer • 37-foot-high transformers
500 kVA backup generator	• 1	• 960 gallons of diesel fuel
500 kV switchrack	• One ~~gas~~air-insulated switchrack • ~~Space for second 500-kV switchrack and enclosure~~ • ~~Space for two future 500-kV capacitor banks~~ • Three bays initially equipped to accommodate two 500 kV line positions and two transformer bank positions	• ~~One 350-foot-~~Approximately 657 feet long, ~~49-foot-~~450 feet wide, and 65 feet high ~~steel enclosure~~ • ~~Up to 50,000~~Approximately 11,515 pounds of SF_6 (circuit breakers) • Four 133-foot-high dead-end structures • Space for additional dead-end structures
115 kV switchrack ~~and future 12 kV switchrack~~	• One open-air insulated switchrack • Space for additional positions on switchrack • ~~Space for future 12-kV switchrack and 115/12-kV transformers~~ • One 115-kV capacitor bank with space for ~~future 12 kV switchrack and 115/12 kV transformers~~ one future 115-kV capacitor bank • ~~Space for three future 115 kV capacitor banks~~	• ~~One~~Two 60-foot-high dead-end ~~structure~~structures • ~~One 43-foot-high dead-end structure~~ • Space for additional dead-end structures • ~~Up to~~Approximately ~~1,200~~1,245 pounds of SF_6 (circuit breakers)
Control building	• Substation monitoring equipment	• 20-feet high, ~~7,040~~10,500 square feet
Parking area and multiple driveways	n/a	• 7,600-square-foot parking area • 30-foot to 45-foot-wide driveways • ~~156,000~~180,000 square feet of road surface[c]
Agricultural water pipe relocation	n/a	• 27-inch-diameter pipe • 1,700 feet long
Transmission Lines (Overhead)		
Line SA: New 500 kV transmission line to connect the proposed Alberhill Substation to existing Serrano–Valley 500 kV Transmission Line	• 6 LSTs • ~~(~~1 LST removed~~)~~[d]	• 1.6 miles long • ~~250~~900-foot to ~~2,100~~1,900-foot spans between LSTs • 200-foot-wide ROW (new)[e]

Component	Approximate Quantity	Approximate Dimensions/Specifications
Line VA: New 500 kV transmission line to connect the proposed Alberhill Substation to existing Serrano–Valley 500 kV Transmission Line ~~(overhead)~~	• 6 LSTs • No structures removed	• 1.7 miles long • ~~250~~1,000-foot to ~~2,100~~2,000-foot spans between LSTs • 200-foot-wide ROW (new)[e]
New overhead ground wires installed on 500-~~kB~~kV Lines ~~AS~~SA and VA	n/a	• 3.3 miles
Subtransmission Line Segments (Overhead and Underground)		
Segment ASP1: New double-circuit 115 kV subtransmission line at proposed substation site	• ~~7~~3 TSPs • ~~3~~2 LWS poles • No structures removed	• 0.~~22~~0.21 miles • ~~On~~Primarily on proposed substation site
Segment ASP1.5: New double-circuit 115 kV subtransmission line and removal of existing single-circuit section of ~~Valley–Elsinore–~~Fogarty-Ivyglen 115 kV line	• ~~4~~6 LWS poles • ~~8~~5 TSPs • 3 existing TSPs and 2 existing ~~TSPs~~wood poles to be modified • ~~(4~~1 LWS pole removed • 5 wood poles~~)~~ removed	• 0.5 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]
Segment ASP2: ~~Double~~Overhead and underground double-circuit Valley–Ivyglen and overhead Fogarty-Ivyglen 115 kV line ~~segment[g]~~segments	• 4 LWS poles • 2 ~~TSP~~TSPs • 1 LWS guy stub • 2 existing TSPs to be modified • 300 feet of new duct bank • ~~(4~~3 LWS poles removed~~)~~ • 2 TSPs removed • 1 wood pole removed	• 6.27 miles • ~~60~~25-foot to ~~100~~35-foot-wide ROW (existing). • ~~Existing distribution line underbuilt to be relocated to new 115 kV structures.~~ • Approximately 0.75 mile of subtransmission circuit to be installed in existing underground duct banks and approximately 300 feet in new duct bank
Segment ASP3: New double-circuit 115 kV line segment and removal of existing single-circuit section of Valley–Elsinore–Fogarty~~–Ivyglen~~ 115 kV line	• ~~13~~11 LWS poles • ~~3~~2 TSPs • 1 LWS guy stub • 2 existing TSPs to be modified • ~~1 LWS guy stub~~ • ~~(13~~11 wood poles ~~and~~ removed • 1 TSP~~)~~ removed	• ~~0.48~~0.46 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]

Component	Approximate Quantity	Approximate Dimensions/Specifications
Segment ASP4: New double-circuit 115 kV subtransmission line and removal of existing single-circuit sections of Elsinore–Skylark 115 kV lines	• ~~101~~98 LWS poles • ~~12~~10 TSPs • ~~12~~9 LWS guy stubs • ~~3 Wood (~~1 existing TSP to be modified~~)~~ • ~~(112 wood poles,~~ 1 LWS~~, and~~ pole removed • 1 TSP removed~~)~~ • 105 wood poles removed • 9 wood guy poles removed	• 4.24 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]
Segment ASP5: New double-circuit 115 kV subtransmission line segment and removal of existing single-circuit section of Valley–Newcomb–Skylark 115 kV line	• ~~109~~93 LWS poles • ~~11~~10 TSPs • 10 LWS H-frame structures[~~h~~g] • ~~1 TSP (modified)~~ • ~~13~~15 LWS guy stubs • 4 existing wood poles and 3 existing TSPs to be modified • ~~(119~~1 LWS pole removed • 3 TSPs removed • 103 wood~~, 2 LWS, 2~~ poles removed • 7 LWS H-frame structures removed[g] • 3 wood H-frame~~[h], 8 LWS H-frame(h))~~ structures[g] removed • 13 wood guy stub poles removed	• 5.5 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]
Segment ASP6: New single-circuit 115 kV subtransmission line segment along existing distribution line route	• ~~100~~91 LWS poles • ~~1 TSP (modified)~~ • 3 TSPs • 7 LWS guy stubs • ~~(~~3 wood poles removed~~)~~	• 3 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line to be relocated to new 115 kV structures
Segment ASP7: New double-circuit 115 kV subtransmission line segment and removal of existing single-circuit section of Valley–Newcomb–Skylark 115 kV line	• ~~9~~6 LWS poles • ~~4~~2 TSPs • ~~3~~2 LWS guy stubs • 1 existing TSP to be modified • ~~(6~~5 wood poles ~~and 2 TSPs~~ removed~~)~~	• 0.25 miles • 60-foot to 100-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]

Component	Approximate Quantity	Approximate Dimensions/Specifications
Segment ASP8: Connect Valley–Ivyglen and Valley–Newcomb single-circuit 115 kV lines	• 3 LWS poles • ~~4~~3 TSPs • 6 existing LWS poles to be modified • 250 feet of new underground subtransmission duct bank • 1 subtransmission vault • ~~(~~1 LWS pole removed • 1 TSP removed • 3 wood poles removed~~)~~	~~• 0.06 miles or 300~~250 feet of underground circuit • Reconfiguring of several existing spans of overhead conductor • 260-foot to 390-foot-wide ROW (existing) • Existing distribution line underbuild to be relocated to new 115 kV structures[f]
Telecommunications Equipment and Fiber Optic Lines (Overhead and Underground)		
New microwave tower at Alberhill Substation	• 1 antenna tower	• 120 feet tall
New dishes at the proposed Alberhill Substation (one), Serrano Substation (one), and the Santiago Peak Communications Site (two)	• 4 microwave dish antennas	• 10 feet wide (each)
~~New overhead ground wires installed on 500 kV lines SA and VA [i]~~	~~n/a~~	~~• 3.3 miles~~
New fiber optic telecommunication line installed on two 115 kV line taps into the proposed Alberhill Substation	• ~~n/a~~1 existing wood pole to be modified • 615 feet of new underground telecom duct bank • 2 new manholes	• ~~2,000~~1,300 feet of overhead line • ~~650~~615 feet of underground line
New fiber optic telecommunication line installed on 115-kV Segments ~~ASP1, ASP 1.5,~~ ASP5, ASP6, and ASP7	n/a	• ~~8.66~~6.8 miles of overhead line • ~~1.11~~1.4 miles of underground line
New telecommunications equipment installed inside existing substations (e.g., microwave radios)	n/a	n/a
Additional Substation Modifications		
Valley Substation	• New conductor, relays, and telecommunications equipment racks, as needed to accommodate new subtransmission lines and equipment removals • 1 existing circuit breaker; 2 disconnect switches; 1 potential transformer; 3 lightning arrestors; and associated foundations, relays, switches, and wiring to be removed.	• Approximately 71 pounds of SF_6 removed (circuit breaker)

Component	Approximate Quantity	Approximate Dimensions/Specifications
Newcomb Substation	• 1 steel dead-end structure • 1 circuit breaker • 1 potential transformer • 3 lightning arrestors • 3 disconnect switches • The telecommunications systems would be upgraded, as required	• One dead-end structure with height consistent with existing adjacent structures • Approximately 83 pounds of SF_6 (circuit breaker)
Skylark Substation	• Relays and switches would be installed/replaced, as required. • The telecommunications systems would be upgraded, as required.	• Existing rack positions would be reused to terminate the new Newcomb-Skylark and Alberhill-Skylark 115 kV subtransmission lines.
Ivyglen Substation	• Relay and telecommunications system upgrades, as required.	n/a
Fogarty Substation	• Relay and telecommunications system upgrades (including a new telecommunications rack), as required.	n/a
Tenaja Substation	• Relay and telecommunications system upgrades (including a new telecommunications rack), as required.	n/a
Totals		
New 500 kV transmission line	n/a	• 3.3 miles
New or modified 115 kV subtransmission line	n/a	• 20.4~~2~~ miles
New fiber optic line	n/a	• ~~8.66~~9 miles overhead • ~~(1.11 miles~~ 1 mile in ~~new~~ underground conduit~~)~~
New 500 kV ROW to be acquired	n/a	• 3.3 miles (200 feet wide)

Component	Approximate Quantity	Approximate Dimensions/Specifications
Number of transmission and subtransmission structures by structure type	• 12 LSTs ~~installed~~ • ~~3 Wood Poles (modified)~~ • ~~346~~313 LWS poles ~~installed~~ • 40 TSPs • 10 LWS H-frame structures ~~installed~~ • ~~51 TSPs installed~~ • ~~36~~35 LWS guy stubs ~~installed~~ • ~~4~~ • 6 existing LWS poles to be modified • 12 existing TSPs to be modified • ~~2 TSPs (~~6 existing wood poles to be modified~~)~~ • 1 LST removed • 7 LWS poles removed • ~~3~~8 TSPs removed • ~~260~~235 wood poles removed • ~~8~~7 LWS H-~~frames~~frame structures removed • ~~2~~3 wood H-~~frames~~frame structures removed • 22 wood guy stubs removed	• LSTs: 95 feet to 190 feet tall, each with four concrete footings • LWS poles and wood poles: 75 feet to 100 feet tall, 1.5 to 2.5 feet in diameter at ground level • H-frame structures: ~~70~~80 feet to ~~80~~100 feet tall, each with two 1.5 to 2.5 feet diameter LWS poles at ground level • TSPs: 70 feet to 115 feet tall, 5 to 8 feet in diameter at ground level (including foundation)

Key: kV = kilovolt, kVA = kilovolt ampere, LST = lattice steel tower, LWS = lightweight steel, MVA = megavolt ampere, n/a = not applicable, SF_6 = sulfur hexafluoride gas, ROW = right-of-way, TSP = tubular steel pole

Notes:

[a] The ~~initial build~~substation would include the installation of two transformers~~, with one of the two~~ and space for a future spare~~. Space would be available for the installation of two additional transformers, for a maximum of three in-service transformers and a spare, if~~ transformer as needed ~~in the future~~.

[b] Approximately ~~34~~39 acres would be needed for construction of the Alberhill Substation, including landscaping and access roads. If ~~the applicant~~SCE elects to excavate 5.2 acres of land adjacent to the northeast corner of the proposed substation site to obtain fill under Import Soil Option 1, then the land required for construction of the proposed substation would increase from ~~34~~39 acres to approximately ~~40~~44 acres (Section 2.4.6.2). This area would also include portions of the 500-kV transmission line and 115-kV Segments ASP1 and ASP1.5.

[c] Road surfaces inside and surrounding the proposed Alberhill Substation would be asphalt, concrete, or gravel (Class II Aggregate).

[d] One 500 kV tower would be removed from the Serrano–Valley 500 kV Transmission Line.

[e] Refer to Tables 2-6 and 2-7 for disturbance area by project component.

[f] A number of the existing single-circuit 115 kV structures to be replaced with double-circuit 115 kV structures have existing distribution and telecommunications lines underbuilt on (installed on the lower position of) the single-circuit 115 kV circuit structures. The existing distribution and telecommunications lines would be relocated to and underbuilt on the proposed double-circuit 115 kV structures.

[g] ~~Placing a second circuit on this proposed Alberhill Project 115-kV segment requires that proposed Valley–Ivyglen Project 115-kV Segments VIG4 and VIG5 are constructed.~~

[h] H-frame structures are constructed using two LWS poles. Existing H-frame structures to be removed consist of two wood poles or two LWS poles. See ~~figure~~Figure 2-8 for a diagram of the H-frame structure~~.~~

~~i Two parallel overhead ground wires would be installed on the top of each of the proposed 500 kV towers.~~

~~The proposed Alberhill Substation would be constructed with enough space for two additional 560 MVA 500/115 kV transformers.~~ When the electrical load exceeds 560 MVA, the ~~first two transformers would serve the~~ spare transformer initially installed would be redesignated as a load~~-~~-serving transformer and a third transformer would be installed as a spare. ~~Based on the applicant's projections, the load may exceed 560 MVA between 2024 and 2029. A fourth transformer would be installed as a spare and the first three transformers would serve the load when the electrical load exceeds 1,120 MVA. The applicant projects that the load may exceed 1,120 MVA between 2037 and 2050, depending on annual growth in electrical demand.~~ Each of the 560 MVA 500/115 kV transformers would be approximately 37 feet high and contain approximately ~~33,550~~34,500 gallons of transformer oil (mineral oil). ~~There would also be space reserved for the future installation of 115/12 kV transformers (Figure 2-7).~~

Switchracks

~~The flat portion of the proposed 124-acre Alberhill Substation site is suitable for substation construction, but it is not large enough for construction of an all open-air insulated substation—a substation where insulation between all common circuits of the same voltage is provided by distance and air in the environment. Instead, for the 500-kV switchracks, the applicant would use gas-insulated switchgear—switchgear that uses gas held within pipes for insulation between common circuits. Gas-insulated switchgear would contain sulfur hexafluoride (SF6), which would allow for a smaller substation footprint (approximately half the size of an open-air insulated substation), requiring less grading.~~

~~The applicant has stated that the removal of more than one million cubic yards of rock and soil would be required to obtain the additional 6 acres of flat land necessary to construct an open-air insulated substation at the proposed site. Hills surrounding the proposed Alberhill Substation site would need to be excavated, which may substantially decrease slope stability. The proposed site is bounded to the north and northeast by the Gavilan Hills; to the west by Love Lane; and to the south by Temescal Canyon Road, Concordia Ranch Road, and I-15. To the east there is a depression in the land, a relatively flat area, and rolling hills.~~

500 kV Switchrack ~~(Gas Insulated)~~

~~The 500-kV switchgear would be housed in a steel enclosure that is approximately 350 feet long, 60 feet wide, and 49 feet high. There would be space reserved at the~~ The proposed ~~Alberhill Substation for a future~~ 500 kV switchrack ~~(Figure 2-7).~~would be comprised of air-insulated switchgear and would measure approximately 657 feet long, 450 feet wide, and 65 feet in height. The 500~~-~~ kV switchrack would consist of ~~six positions~~five bays with two operating buses and arranged in a breaker-and-a-half configuration. ~~The operating buses would have six 500-kV gas-insulated potential transformers. Initially, four positions would be installed.~~ Three ~~positions~~bays would be equipped ~~for~~to accommodate two 500~~-~~ kV line positions and two transformer bank positions. The two 500 kV line positions and two bank positions would be equipped with approximately 133-foot-tall line/bank dead ends. The 500 kV transmission lines and transformer bank leads would have twelve 500~~-~~ kV lightning arresters.

115 kV Switchrack ~~and Future 12 kV Switchrack (Open-Air Insulated)~~

The 115 kV switchrack would use open-air-insulated switchgear. ~~Five~~Upon initial construction, five 115 kV lines would extend from the ~~proposed~~ 115 kV switchrack. There would be space reserved at the proposed Alberhill Substation for an extension of the 115 kV switchrack. If the proposed substation is expanded in the future ~~and up~~ to ~~three~~include two load-serving 500/115 kV transformers ~~are operational, it is estimated that~~and one spare transformer, up to ~~10~~11 115 kV lines may ultimately extend from the 115 kV switchrack. The 115 kV operating buses would have eighteen 115 kV lightning arresters. The initial-build of the 115 kV switchrack would connect to two dead-end structures.[~~7~~8] ~~Space would be reserved at the proposed Alberhill Substation for a future 12 kV switchrack.~~

Capacitor Banks

One 115 kV capacitor bank would be installed ~~in the initial build of~~at the proposed Alberhill Substation with a circuit breaker and a disconnect switch. The capacitor bank would be approximately 14 feet high. Space would be reserved for ~~three~~one additional 115 kV capacitor bank. ~~banks and two 500 kV capacitor banks.~~

Control Building

Monitoring equipment for the proposed Alberhill Substation would be located in a permanent control building that would be constructed of prefabricated metal ~~and include a full basement~~. The control building (~~7,040~~10,500 square feet) would be approximately ~~64~~70 feet wide, ~~110~~150 feet long, and 20 feet high. It would be equipped with air conditioning, control and relay panels, battery and battery charger, and communication equipment. Approximately 150 pounds of hydrofluorocarbon refrigerant (HFC-410ACE) would be used for the air conditioning system. The applicant would install an early-detect smoke and fire detection system. Handheld fire extinguishers rated for electrical fire would be available in the control building and within the proposed substation boundary. No other fire suppression systems would be installed at the proposed Alberhill Substation.

Electrical Power

The proposed Alberhill Substation would have three sources of electrical power for the control building and other ancillary facilities. The primary source of power would be an output of one of the proposed substation's main transformers. A secondary source would be a nearby distribution line that would be connected to the proposed Alberhill Substation site. For emergency use, one 500 kVA, 120/240 volt, ~~3~~three-phase, stationary backup generator would be installed at the proposed substation site. It would have a diesel tank capable of storing approximately 960 gallons of diesel fuel.

Lighting

The proposed Alberhill Substation would have access and maintenance lighting. The lighting would conform to Riverside County Ordinance 655, which regulates and specifies criteria for light pollution with regard to the Palomar Observatory.

The access lighting would be low-intensity and controlled by a photo sensor. Each gate at the proposed Alberhill Substation would have a beacon light installed for safety and security purposes. The beacon lights would be illuminated only while the gates are open or in motion. The applicant typically uses double-flash strobe lights as beacon lights on substation gates.

Maintenance lights would be controlled by a manual switch that would normally be in the "off" position. Maintenance lights would be used only when required for switching, maintenance or emergency repairs that occur at night. The lights would be located in the switchracks, around the transformer banks, and in areas of the proposed Alberhill Substation where maintenance activity may take place, and would be directed downward and shielded to reduce glare outside of the proposed substation.

[~~7~~8] *Dead-end structures* are higher-strength structures used at the termination point of powerlines that are designed to support the high-tension forces associated with the length of the line leading up to the termination point. Higher-strength structures are also installed where powerlines change direction.

Entrance, Love Lane, Gates, Driveways, Parking, and Perimeter Wall

Love Lane, sections of which would be within the footprint of the proposed Alberhill Substation site, would be relocated from ~~130~~105 to 180 feet west to the location shown in Figure 2-7. The relocated section of road would be paved, 36 feet wide, and extend approximately 250 feet north of Temescal Canyon Road. A 30-foot-wide access driveway would be constructed to the east of the relocated road that would lead to the proposed substation's main entry gate. To the north, the section of relocated road would be unpaved and join the existing, unpaved Love Lane, approximately 400 feet north of the proposed substation access driveway.

Four gates would be installed. A 40-foot-wide, electrically operated main entrance gate would allow two-way traffic access into the proposed Alberhill Substation (Figure 2-7). A similar, 40-foot-wide, secondary access gate would be located facing Temescal Canyon Road. A 24-foot-wide, manually operated gate would be located at the eastern end of the proposed substation to provide access to the 500 kV transmission lines. A walk-in gate would be installed either on the west wall facing Love Lane or the south wall facing Temescal Canyon Road. The walk-in gate location would be determined during final design of the proposed Alberhill Project. All of the gates would be at least 8 feet high and a maximum of 14 feet high.

Within the proposed Alberhill Substation, a series of driveways would be constructed to facilitate vehicular movement and access to substation equipment. ~~Space would also be reserved for a driveway to access the future 500-kV capacitors.~~ In addition, a parking area would be constructed. Refer to Table 2-2 for driveway and parking area dimensions.

The applicant would install a temporary chain-link fence around the proposed Alberhill Substation site after existing vegetation and facilities are cleared and ~~a~~before the permanent perimeter wall is constructed. The chain-link fence would be removed upon perimeter wall completion. The perimeter wall would be a minimum height of 8 feet and a maximum height of 14 feet. It would be constructed of concrete panels or decorative block and would be constructed to surround the proposed Alberhill Substation. The wall would be constructed to safety standards and may need to comply with the current version of NERC/CIP requirements for major electrical facilities. It would be designed to be consistent with the surrounding community's construction standards. A band of at least three strands of barbed wire and/or a top guard (e.g., barbed wire or spiked strips) would be affixed to ~~near~~ the ~~top of the~~ perimeter wall of ~~inside~~ the proposed Alberhill Substation. ~~The barbed wire would not be visible from outside the substation.~~ Landscaping and irrigation would be installed after the proposed Alberhill Substation wall is constructed.

Substation Setback

The minimum setback from the proposed Alberhill Substation wall to the road ROW for Temescal Canyon Road would be between approximately 48 and 63 feet. This would be a setback of between approximately 88 and 103 feet from the wall to the existing pavement edge. If County of Riverside road improvement plans are constructed on Temescal Canyon Road, the minimum setback from the proposed substation wall to the future road curb face would be between approximately 69 and 84 feet. The minimum setback from the proposed Alberhill Substation wall to the road ROW for Concordia Ranch Road would be about 33 feet, which would be about 53 feet from the existing pavement edge.

Restroom, Septic System, and Landscaping

A stand-alone, prefabricated, permanent restroom would be installed within the proposed Alberhill Substation perimeter. The proposed Alberhill Substation site is not served by a public sewer system. A new septic system or holding tank would be installed in accordance with all Riverside County Department of Environmental Health permit requirements. The restroom would be approximately 10 feet wide, 10 feet long, and 10 feet high.

Landscaping for the proposed Alberhill Substation would be designed to filter views from the surrounding community while maintaining substation security and safety standards. Irrigation and landscaping installation would occur after construction of the proposed substation perimeter wall and after water service has been established.

Water Pipeline Relocation

A 27-inch agricultural water pipeline, owned and operated by the Elsinore Valley Municipal Water District, crosses the proposed Alberhill Substation site. The existing gravity-fed water pipeline is located on a 1.3-acre parcel that runs across the middle of the proposed substation site. A 32-inch pipeline would be installed to replace the existing water pipeline. The new pipeline would be rerouted to the perimeter of the substation property prior to construction of the proposed Alberhill Substation (Figure 2-7).

Currently, the water line is not in use. If needed, it is available for local agricultural and industrial uses. The new water line would be located underground within new easement on the proposed Alberhill Substation property. It would be constructed prior to disturbing the existing water line, allowing connections on the upstream and downstream ends to occur toward the end of the line’s construction schedule to minimize service disruption. The Elsinore Valley Municipal Water District anticipates that the line would be out of service for one workday, approximately eight hours, and no more than two days (Baiyasi 2011).

The new pipeline would be buried and would connect to the existing pipeline at the western edge of the proposed substation property, follow the new substation access road south to the Temescal Canyon Road ROW, turn southeast parallel to the Temescal Canyon Road ROW, and then connect to the existing pipeline at a point across Concordia Ranch Road southeast of the proposed Alberhill Substation property (Figure 2-7). The trench excavated to install the new pipeline alignment would be approximately 4 feet wide and 6 feet deep. The length of relocated water pipeline would be approximately 1,700 feet, which would extend the existing length by approximately 50 feet.

2.3.2.2 500-kV Transmission Lines

The applicant proposes to construct two new 500 kV transmission lines (500 kV Line SA and 500 kV Line VA) to connect the proposed Alberhill Substation to the existing Serrano–Valley 500 kV Transmission Line (Figure 2-~~2i~~2a). Line SA would be approximately 1.6 miles long and Line VA would be approximately 1.7 miles long. Construction of the 500 kV transmission lines would require the removal of one 500 kV lattice steel tower (M13-T4) and installation of 12 new lattice steel towers (500 kV towers SA1 to SA6 and VA1 to VA6).

The lattice steel tower footings would require four excavated holes 3 feet to 6 feet in diameter and 20 feet to 45 feet deep. ~~On average, footings~~Where necessary, micropile foundations may be used. Installation of micropiles would require the drilling of several smaller diameter holes (approximately 4 to 10, 4-inch holes) for each foundation. The micropiles would then be tied together to form a single, reinforced concrete cap upon which the tower leg would be installed. Typically, footings would extend above the ground between 1 and 4 feet. The two lattice steel towers installed nearest to the proposed Alberhill Substation would be taller, double-circuit towers, but the conductor would be installed only on one side of the towers as part of the proposed Alberhill Project. The other 10 lattice steel towers installed would be single-circuit towers (Figure 2-8).

The lattice steel towers would have a dull galvanized steel finish. They would support 2,156-kcmil non-specular aluminum steel-reinforced conductors, polymer insulators, and overhead ground wires. The rating of the proposed aluminum conductor steel-reinforced ~~(~~ACSR~~)~~ would be the same as the existing conductor used on the Serrano–Valley 500 kV Transmission Line. The normal rating (in clear atmospheric conditions, with an ambient temperature of 104 degrees Fahrenheit, at an elevation of 500 feet, and with a wind speed of 4 feet per second) of the existing and proposed 2,156-kcmil ACSR is 3,950 amps when in continuous operation. The emergency rating, assuming 4 hours of operation, is 5,330 amps.

Lake Mathews/Estelle Mountain Reserve

The existing Serrano–Valley 500 kV Transmission Line ROW is adjacent to land managed by the Bureau of Land Management (BLM) and traverses areas managed by the Riverside County Habitat Conservation Agency within the Lake Mathews/Estelle Mountain Core Reserve (Core Reserve; Figure~~s~~ 2-2a~~ and 2-2i). Along the Serrano–Valley 500 kV Transmission Line ROW, construction of the proposed Alberhill Project would occur within the existing ROW with the exception of areas~~). Construction near the proposed sites for 500 kV Towers SA6 and VA6 and existing 500 kV tower sites M13-T4, M13-T3, and M13-T2~~.~~ would occur within the existing Serrano–Valley 500 kV Transmission Line ROW. Wire-stringing equipment and vehicles may be required to back up onto an existing access road and other areas within the Core Reserve adjacent to proposed tower sites SA6 and VA6 and existing tower site M13-T4, as shown in Figure 2-~~2i~~2a. Land managed by the BLM within the Core Reserve would not be disturbed for construction uses other than by construction vehicles that would drive on an existing access road to tower sites M13-T3 and M13-T2 (Figure 2-~~2i~~2a), which traverses BLM land for a few hundred feet. Construction activities within the Core Reserve are further described in Section 2.4.5.5, under the heading "Grounding and Snubbing: Core Reserve Access," and in Section 2.4.5.6, under the heading, "500 kV Transmission Line Wire Stringing." Work may occur within the Core Reserve during a period that would last up to 4 weeks (USFWS and CDFW 2013a). No earth moving, road widening, or nighttime activities are proposed within the Core Reserve (USFWS and CDFW 2013b).

2.3.2.3 115-kV Subtransmission Lines (Segments ASP1 through ASP8)

The proposed Alberhill Project would involve the construction of new 115 kV subtransmission lines and modification of existing 115 kV subtransmission lines. The routes of the proposed 115 kV lines area identified by Segments ASP1 through ASP8 on Figures 2-2a through 2-~~2c, 2-2e, and 2-2g through 2-2i~~2m. LWS poles, TSPs, guy stubs and H-frames would be used for construction of the new 115 kV subtransmission lines (Figure 2-8). Each of the proposed 115 kV structures would support polymer insulators, 954-kcmil stranded aluminum conductor (SAC), and 4/0 ACSR for grounding. If needed, 954-kcmil ACSR would be used at locations requiring higher tension.[~~8~~9] The normal rating (in clear atmospheric conditions, with an ambient temperature of 104 degrees Fahrenheit, at an elevation of 500 feet, and with a wind speed of 4 feet per second) of the proposed 954-kcmil SAC is 1,090 amps when in continuous operation. The emergency rating, assuming 4 hours of operation, is 1,470 amps. The 115 kV lines that would be replaced along 115-kV Segments ASP3, ASP4, ASP5, and ASP7 use 653-kcmil ACSR with a normal rating of 920 amps and emergency rating of 1,240 amps under the same conditions identified for the proposed 954-kcmil SAC previously described.

For the purposes of this document, it is assumed that the 115 kV structures to be replaced ~~removed~~ could be located at any point along 115-kV Segments ASP1.5 through ASP8 and that new 115 kV structures

[~~8~~9] Stranded aluminum 954-kcmil conductor has a diameter of approximately 1.1 inches. The American Wire Gauge conductor size 4/0 is equivalent to 212-kcmil conductor, which is approximately 0.5 inch in diameter. Aluminum steel-reinforced 954-kcmil conductor, which is composed of strands of aluminum on the outer shell of the conductor cable and strands of steel in the core, is generally a few millimeters in diameter wider than 954-kcmil stranded aluminum conductor, which does not contain a steel core (Grigsby 2001).

could be installed anywhere along 115-kV Segments ASP1~~, ASP1.5, and ASP3~~ through ASP8. Similarly, replacement of the four structures along an approximately 1,000-foot section of 115-kV Segment ASP2 that extends east of the intersection of Concordia Ranch Road and Temescal Canyon Road could occur at any location within an approximately 1,000-foot-long section east of the proposed Alberhill Substation site. The precise location and type of each 115 kV structure to be installed would be determined during final engineering. Wood poles, guy poles, LWS poles, ~~hybrid poles~~H-frames, and TSPs would be used for construction of the new 115 kV subtransmission lines (Figure 2-8).~~ The location of switches and open spans that may be needed in addition to those indicated for 115 kV Segment ASP8 would also be determined during final engineering.~~

The estimated number of structures to be removed and installed and the length of each 115 kV segment are provided in Table 2-2. Each of the following segments are shown in more detail in Figures 2-2a through 2-~~2c, 2-2e, and 2-2g through 2-2i~~2m.

115-kV Segment ASP1

115-kV Segment ASP1 would be a new double-circuit 115 kV subtransmission line at the proposed Alberhill Substation site that would connect the substation to 115-kV Segment ASP2. New TSPs and LWS poles would be installed (Table 2-2). The new double-circuit 115-kV line would connect to the 115 kV switchrack at the western end of the proposed Alberhill Substation (Figure 2-7). The line would exit the proposed substation near the main entry gate, turn south, and then parallel the substation perimeter south to Temescal Canyon Road. The line would continue southeast along Temescal Canyon Road to Concordia Ranch Road.

115-kV Segment ASP1.5

The 115-kV Segment ASP1.5 would connect to the new 115 kV switchrack at the western end of the proposed Alberhill Substation (Figure 2-7). The segment would exit the proposed substation near the main entry gate, turn south/southwest, and then cross Temescal Canyon Road to a point along the existing Fogarty–Ivyglen 115 kV line alignment. The 115-kV Segment ASP1.5 would then extend southeast along Temescal Canyon Road and cross I-15 (~~Figure~~Figures 2-2a and 2-2b). The 115-kV Segment ASP1.5 would be a double-circuit subtransmission line.

Note that an additional single-circuit 115 kV subtransmission line would extend from the proposed Alberhill Substation. Five 115 kV lines would extend from the initial build of the proposed Alberhill Substation. The additional single-circuit line would likely follow the alignment of either 115-kV Segment ASP1 or ASP1.5 after exiting the proposed substation's 115 kV switchrack. The alignment of the additional single-circuit line would be determined during final engineering for the proposed Alberhill Project.

115-kV Segment ASP2

Overhead

The 115-kV Segment ASP2 would place a second circuit on an approximately 6.3-mile section of ~~the proposed~~ existing subtransmission lines installed as part of the Valley-Ivyglen Project, including sections of the Valley–Ivyglen 115 kV ~~line (~~Subtransmission Line and Fogarty–Ivyglen 115~~-~~ kV ~~Segments VIG4 and VIG5; Figures 2-2a and 2-2b).~~Subtransmission Line. As part of the ~~proposed~~ Valley-Ivyglen Project, ~~four~~two TSPs and two LWS poles ~~would be~~were installed on the south side of Concordia Ranch Road to avoid conflicts that would occur during construction of the proposed Alberhill Substation. As part of the ~~proposed Alberhill~~Proposed Project, three replacement LWS poles and two ~~one TSP~~TSPs would be installed on the north side of Concordia Ranch Road (Table 2-2). The final location of the ~~five four~~ poles on the north side of Concordia Ranch Road would accommodate 115 kV circuits that would exit Alberhill

Substation to the east on poles constructed as part of the Valley–Ivyglen Project. ~~kVNo~~At the eastern end of Concordia Ranch Road, the 115-kV Segment ASP2 would turn to the south and cross I-15. In the vicinity of Temescal Canyon Road and Bernard Street, one new TSP would be installed and two existing TSPs would be modified to facilitate adding a second circuit in this location and allow the required change in line angles. No other structure installation or replacement would be required along the overhead portion of 115-kV Segment ASP2~~as part of the proposed Alberhill Project~~. The ~~proposed~~ Valley–Ivyglen 115 kV ~~line isdesigned~~Subtransmission Line and new sections of the Fogarty-Ivyglen 115 kV Subtransmission Line were designed to support two circuits. To add the second circuit along 115-kV Segment ASP2, the ~~proposed~~existing Valley–Ivyglen and Fogarty–Ivyglen 115 kV line structures would require the addition of crossarms, anchors, insulators, and conductor.

Double-circuiting would begin at the southeastern end of 115-kV Segment ASP1 and follow Concordia Ranch Road east to its terminus. From there it would cross I-15 south to Temescal Canyon Road and then continue east to Lake Street. From Lake Street, it would continue south to Nichols Road. The line would then follow Nichols Road to Pierce Street and then turn southeast on Baker Street and continue to Riverside ~~Avenue~~Drive (SR-74). The line would follow Riverside ~~Avenue~~Drive northeast and then pass southeast over land to Pasadena Avenue. ~~It~~ The overhead portion of 115-kV Segment ASP2 would continue along Pasadena Avenue ~~and then turn northeast onto Third Street and continue to Collier Avenue~~for approximately 60 feet before terminating at an existing riser TSP.

Underground

At an existing riser TSP on Pasadena Avenue, 115-kV Segment ASP2 would transition to an underground configuration and continue southeast along Pasadena Avenue within existing duct banks installed as part of the Valley–Ivyglen Project. The line would then turn northeast onto Third Street and continue in an existing duct bank until Collier Avenue. Near the intersection of Collier Avenue and Third Street, approximately 300 feet of new underground duct bank would be installed to the base of a new riser TSP that would be installed as part of 115-kV Segment ASP3.

115-kV Segment ASP3

Along 115-kV Segment ASP3, a second circuit along a section of the Valley–Elsinore–Fogarty 115 kV line would be installed and the existing single-circuit section of the line would be removed. New structures capable of supporting two circuits would be installed. The new LWS poles and ~~several~~ TSPs would be installed to enable the crossing of I-15 (Table 2-2). Wood poles and the existing TSPs adjacent to I-15 would be modified or replaced in the City of Lake Elsinore between the intersections of Third Street and Collier Avenue and Second Street and Camino del Norte.

115-kV Segment ASP4

115-kV Segment ASP4 includes installation of new double-circuit LWS poles and TSPs along a section of the Elsinore-Skylark 115 kV ~~lines~~line as well as removal of the existing single-circuit sections of the ~~lines~~line (Table 2-2). From East Hill Street southwest to East Pottery Street, structures would be constructed and removed along a section of the Elsinore–Skylark 115 kV line. From East Pottery Street east to East Franklin Street and then southeast to Skylark Substation, structures would be constructed and removed on the Elsinore–Skylark 115 kV line. The line would continue from East Franklin Street over land and then along Auto Center Drive, Casino Drive, Malaga Road, and Mission Trail to Skylark Substation.

115-kV Segment ASP5

115-kV Segment ASP5 includes installation of new double-circuit LWS poles, TSPs, and LWS H-frame structures along a section of the Valley–Newcomb–Skylark 115 kV line (Table 2-2). The existing 115 kV

LWS poles, H-frame structures, and wood poles would be removed; the existing TSPs along this segment would be replaced or modified. This segment would pass through the cities of Wildomar and Menifee.

Starting at Skylark Substation, the double-circuit lines would continue east across Mission Trail Road to Waite Street. It would follow Waite Street and then turn north onto Almond Street and continue to Lemon Street. It would cross I-15 and continue east along Lemon Street to where the street turns into Lost Road. It would continue northeast on Lost Road and then turn east and cross open land and multiple roads to Beverly Street. It would follow Beverly Street and then continue east along Bundy Canyon Road to Scott Road.

115-kV Segment ASP6

115-kV Segment ASP6 includes construction of LWS poles and TSPs for a new single-circuit 115 kV subtransmission line north from the intersection of Scott Road and Murrieta Road to Newport Road. An existing distribution line with wood poles along Murrieta Road would be removed, and the distribution line conductor would be transferred to and underbuilt on the new 115 kV structures (installed below the new 115 kV circuit).

115-kV Segment ASP7

115-kV Segment ASP7 includes installation of new double-circuit LWS poles and TSPs along a section of the Valley–Newcomb–Skylark 115 kV line north of the intersection of Newport Road and Murrieta Road to Newcomb Substation in Menifee. Existing 115 kV wood structures would be removed. In addition, the circuit breaker at Newcomb Substation that connects the substation to Valley Substation would be opened, which would disconnect Newcomb Substation from Valley Substation (Figure 2-3).

115-kV Segment ASP8

115-kV Segment ASP8 includes installation of ~~new LWS poles and TSPs along a 300-foot section at~~approximately three LWS poles, two riser TSPs, 250 feet of underground duct bank, one subtransmission vault, and the replacement of one existing TSP near the intersection of Murrieta Road and McLaughlin Road in Menifee to connect the Valley–Newcomb 115 kV ~~line~~Subtransmission Line to the ~~proposed~~ Valley–Ivyglen 115 kV ~~line~~Subtransmission Line (Figure 2-~~2f). Existing~~2m). In addition, approximately four existing 115 kV ~~wood~~ structures would be removed and six existing 115 kV~~.~~ structures would be modified. The circuit breaker that connects the ~~proposed~~ Valley–Ivyglen 115 kV line to Valley Substation would be opened to ensure that the line is deenergized from Valley Substation (Figure 2-3).

The Valley–Newcomb 115 kV line from Valley Substation would be disconnected by creating an open span.~~[9]~~[10] The open span would be located near Murrieta Road. The circuit breaker that connects the Valley–Newcomb 115 kV line to Valley Substation would be ~~opened~~removed to ensure that the line is deenergized (Figure 2-3).

~~[9]~~[10] The creation of an open span does not indicate that a span of conductor would be removed between two poles. Instead, only the jumper loop wire that provides electrical connectivity to the line would be disconnected and secured. By disconnecting, folding back, and securing the jumper loop wire, a permanent physical and electrical separation is made. The disconnected jumper loop wire would also be grounded by connecting it to a ground wire that runs the length of the pole. According to the applicant, creating a permanent physical and electrical separation effectively creates a break in the connectivity of the line such that personnel would not inadvertently cause a switching error or an unsafe situation.

2.3.2.4 Telecommunications

The proposed Alberhill Substation would require the installation of new telecommunication infrastructure to provide protective relaying, data transmission, and telephone services to the substations served by the proposed Alberhill System. These new facilities include modifications to the applicant's existing microwave system and the addition of new fiber optic cable. The proposed Alberhill Project would include the installation of new telecommunication infrastructure required for communication with the substations served by the proposed Alberhill 115 kV System. New microwave components, fiber optic cable, and other telecommunications equipment installations would be part of the proposed Alberhill Project.

Microwave System: Alberhill Substation, Santiago Peak, and Serrano Substation

To connect the proposed Alberhill Substation to the applicant's microwave communications system, a 120-foot-tall microwave antenna tower would be built at the proposed Alberhill Substation site (Figure 2-7). The applicant would install one microwave dish antenna on the new tower and three microwave dish antennas on two existing antenna towers. One of the existing antenna towers is located at the Santiago Peak Communications Site, which is located approximately 7 miles west of the proposed Alberhill Substation site (Figure 2-1). The second existing antenna tower is located at Serrano Substation in the City of Orange in Orange County. One dish antenna at the Santiago Peak Communications Site would be directed toward the microwave antenna tower at the proposed Alberhill Substation and the other toward Serrano Substation, which is west of the Santiago Peak Communications Site. The dish antenna at Serrano Substation would be directed toward the Santiago Peak Communications Site. All four microwave dish antennas would be 10 feet in diameter. A typical 120-foot-tall microwave antenna tower is shown in Figure 2-9.

In addition, new microwave radios and channel equipment would be installed inside existing telecommunications control rooms at the Santiago Peak Communications Site and Serrano Substation and the ~~control~~telecommunications room at the proposed Alberhill Substation.

The Santiago Peak Communications Site is located in the Cleveland National Forest on Santiago Peak in the Santa Ana Mountains, approximately 11 miles south of Corona, California. One section of the Santiago Peak Communication Site is located in Riverside County and the other in Orange County. Only the Orange County section of the Santiago Peak Communications Site would be accessed for proposed Alberhill Project activities. The applicant would access the communications site from Indian Truck Trail Road, which intersects with I-15 near Lee Lake, about 2.5 miles northwest of the proposed Alberhill Substation site.

Fiber Optic Lines and Telecommunications Equipment

~~The proposed Alberhill Substation would be connected to an existing fiber optic system serving Valley, Mira Loma, and Serrano substations (Figure 1-1) overhead along the Serrano–Valley 500 kV Transmission Line (Figure 2-2a).~~ To connect the five 115/12 kV substations that would be transferred to the proposed Alberhill 115 kV System, new fiber optic cable would be installed overhead along the 115~~-~~ kV segments specified in Table 2-2 and shown in Figure 2-5a through ~~e~~f.

Trenching outside the footprint of the Alberhill (proposed), Skylark, and Newcomb substations to the nearest suitable utility pole would be required within the general disturbance area shown in Figures 2-~~6b~~5a, 2-5b, and 2-~~6c~~5f. Trenching to install fiber optic line underground would also be required at several locations within and adjacent to the general disturbance area along Mission Trail Road, Lemon Street, and Murrieta Road (Figure 2-~~6c~~5b, 2-5d, and 2-5e). New telecommunications equipment would be installed within the telecommunications rooms at the ~~Serrano,~~ Barre, Walnut, Mira Loma, Serrano, Ivyglen, Fogarty, Skylark, Tenaja, Newcomb, and Valley substations to facilitate the new telecommunications connections. Telecommunications systems would also be upgraded at the Box Springs Communications Site, which is located northwest of the City of Moreno Valley, California, and the applicant's Irvine Operations Center in southeastern Irvine, California.

2.3.2.5 Access Roads

~~Each~~Nine of the proposed 500 kV transmission line tower sites ~~could~~would require 24-hour vehicular access during operation of the proposed Alberhill Project for emergency and maintenance activities. The applicant would install gates to restrict general and recreational vehicular access roads. The applicant would construct approximately 3.4 ~~approximately 6.1~~ miles of new or modified access roads to access the proposed 500 kV transmission line structures (Table 2-~~6~~7; Figure 2-2a~~2i) if the conventional method of construction is used for the 500-kV transmission line (refer to Section 2.4.5.5~~).

The proposed Alberhill 115 kV segments would not require new or modified access roads~~,~~.~~, except for a short access road segment for 115 kV Segment ASP5.~~

~~Access road widths would vary as described in Section 2.3.1.3 for the proposed Valley–Ivyglen Project. For the purposes of this document and to ensure that the applicant has the required flexibility needed during construction, it is assumed that any~~ Any of the proposed 500-kV tower site access roads could be up to 26 feet wide. In addition, it is anticipated that additional permanent and temporary disturbance areas for vehicle turnaround and positioning would be required during access road construction due to hilly terrain along the proposed 500 kV transmission line routes. In some locations, the permanent, graded disturbance areas may be as wide as ~~200~~220 feet, and the temporary disturbance areas may be as wide as ~~500~~350 feet. Excess soils and vegetation from access road construction would be distributed within the permanent, graded disturbance areas adjacent to the proposed access roads or disposed of as described in Section 2.4.4.8. Refer to the disturbance calculations in Section 2.4.2.2.

2.3.2.6 Additional Substation Modifications

In order to accommodate the changes to the transmission and subtransmission systems associated with the Proposed Project, the applicant would modify their existing Valley, Newcomb, Skylark, Ivyglen, Fogarty and Tenaja substations as follows:

- Valley Substation: An existing 115-kV circuit breaker; two disconnect switches; one potential transformer; three associated lightning arrestors; and associated foundations, relays, switches, and wiring would be removed. Conductor to replace the removed circuit breaker would be installed. In addition, new relays to accommodate the new Valley-Newcomb-Tenaja and Alberhill-Newcomb-Valley 115 kV subtransmission lines and new telecommunications equipment racks would be installed, as needed.

- Newcomb Substation: A new steel dead-end structure; circuit breaker; potential transformer; lightning arrestors; disconnect switches; associated foundations; and connections needed for electrical, instrumentation, and communications systems would be installed/constructed to accommodate the termination of the new Newcomb-Skylark 115 kV Subtransmission Line. In addition, existing relays would be replaced and the telecommunications systems upgraded to accommodate the circuit changes and addition of the new Newcomb-Skylark fiber optic line.

- Skylark Substation: The existing connection to the Skylark-Tenaja 115 kV Subtransmission Line would be removed and the existing rack position would be reused to terminate the new Newcomb-Skylark 115 kV Subtransmission Line. The existing connection to the Valley-Newcomb-Skylark 115 kV Subtransmission Line would be removed and the existing rack position would be reused to terminate the new Alberhill-Skylark 115 kV Subtransmission Line. Relays and switches would be installed/replaced, as required, and the telecommunications systems would be upgraded to accommodate the circuit changes and the addition of the new Newcomb-Skylark fiber optic line.

- Ivyglen Substation: Relays and associated telecommunications circuits would be upgraded.
- Tenaja Substation: Relays and associated telecommunications circuits would be upgraded, as required.
- Fogarty Substation: Relays and associated telecommunications circuits would be upgraded, as required. The existing digital telecommunications circuit would be upgraded to current standards and a new telecommunications rack would be installed.

At these substations, the applicant would also rename circuits and update relay settings as needed.

2.4 CONSTRUCTION OF THE PROPOSED PROJECTS

2.4.1 Schedule, Equipment, and Personnel

The anticipated construction schedule for the proposed projects is provided in Table 2-3. The estimated construction schedule in miles or quantity per day for the proposed 500 kV transmission lines, 115 kV subtransmission lines, and fiber optic lines is provided in Table 2-4.

Table 2-3 Estimated Construction Schedule

Project Components	Estimated Start	Duration
ASP: 115-kV Lines (ASP1 to ASP8)	~~Q1 2018Spring2017~~Q2 2026	28 months
ASP: Telecommunications	Q3 ~~2018 Winter2017~~2027	12 months [(a)]
~~VIG: 115-kV Lines (VIG1 to VIG8)~~	~~Q1 2017Fall2016~~	~~2827 months~~
~~VIG: Telecommunications~~	~~Q4Summer 2017~~	~~7 months~~
ASP: Proposed Alberhill Substation	~~Q1 2018 Summer 2016~~Q2 2026	~~21~~24 months
ASP: Additional Substation Modifications	Timing to be determined during final engineering	6 months
ASP: 500-kV Lines	~~Q1 2019Summer2017~~Q3 2026	17 months
ASP ~~and VIG~~: Testing	Timing to be determined during final engineering	~~3~~6 months
~~**Estimated Operational Date (VIG)**~~	~~Q4 2019 (28**Fall/Winter 2018** (27 months to construct)~~	
Estimated Operational Date (ASP)	~~Q4 2020Summer 2019 (28~~Q2 2029 (30 months to construct)	

~~Sources: SCE 2011, 2013, 2014~~

Key: ASP = Alberhill System Project, kV = kilovolt, ~~VIG = Valley–Ivyglen 115-kV Subtransmission Line Project~~,

Note:

(a) The applicant does not anticipate that the proposed telecommunications installations would require more than 12 months to complete, but the telecommunications installations may occur at any time throughout the 12-month period beginning in Q3 ~~2018~~2027~~Winter 2017~~.

Table 2-4: Daily Transmission, Subtransmission, and Fiber Optic Line Construction Schedule Estimates

Construction Activity	Estimate
500 kV Transmission Lines (Alberhill Project)	
Survey	1 mile per day
Road and landing work	0.5 miles per day (2 structure pads per day)
LST removal	0.75 towers per day
Install LST foundation	0.5 towers per day
LST haul/delivery	1 tower per day
LST assembly	0.5 towers per day
LST erection	1 tower per day
Wire stringing	0.35 miles per day
Restoration	0.5 miles per day
115 kV Subtransmission Lines ~~(Valley–Ivyglen and Alberhill Projects)~~	
Surveys	1 mile per day
Staging yards	Duration of construction
Right-of-way clearing	0.25 miles per day (4 structure pads per day)
Guard structure installation	5 structures per day
Remove existing wood poles	5 poles per day
Remove existing LWS poles	2 poles per day
TSP foundation	0.5 foundations per day
TSP assembly	1 pole per day
TSP erection	1 pole per day
~~Hybrid pole assembly~~	~~1 pole per day~~
~~Hybrid pole erection~~	~~1 pole per day~~
LWS pole haul/delivery	5 poles per day
LWS pole assembly	4 poles per day
LWS pole erection	4 poles per day
Wood pole installation	4 poles per day
~~Shoofly LWS pole haul/delivery~~	~~5 poles per day~~
~~Shoofly LWS pole assembly~~	~~4 poles per day~~
~~Shoofly LWS pole installation~~	~~4 poles per day~~
Underground vault installation	0.33 vaults per day
Duck bank installation	200 feet per day
Install underground cable	350 feet per day
Conductor and overhead ground wire installation	0.33 mile per day

Construction Activity	Estimate
Guard structure removal	6 structures per day
Restoration	1 mile per day
Fiber Optic Lines ~~(Valley–Ivyglen and Alberhill Projects)~~	
Trenching	350 feet per day
Duct bank installation	350 feet per day
Manhole installation	2 manholes per day
Wire stringing	5,000 feet per day

Key: kV = kilovolt, LST = Lattice Steel Tower, LWS = Lightweight Steel, TSP = Tubular Steel Pole~~, Hybrid pole = TSP with prefabricated concrete base section~~

Construction activities would be scheduled during ~~daylight~~ hours within the local noise ordinance, Monday through Saturday. In the event that construction activities are required to take place outside of the days and hours specified by local ordinance, the applicant would take actions consistent with Project Commitment H, as listed in Section 2.6, "Project Commitments." Construction would be performed by either the applicant's construction crews or contractors, depending on the availability of the applicant's construction personnel at the time of construction. If the applicant's transmission and telecommunications construction crews are used, crews would likely be based at one of the applicant's local facilities, such as Valley Substation (Menifee Service Center) or Wildomar Service Center. Contractor construction personnel would be managed by the applicant's construction management personnel.

For the proposed Alberhill Project, it is conservatively estimated that a maximum of 200 workers per day (approximately 100 at the Alberhill Substation site, approximately 50 on the 115 kV subtransmission line, and approximately 50 on the 500 kV transmission lines) would be working during construction. ~~For the proposed Valley–Ivyglen Project, the applicant estimates that up to 125 workers per day would be required during construction.~~ Equipment used for project activities is contained in the air quality calculations in Appendix B.

2.4.1.1 Alberhill Project Schedule for Water Pipeline Relocation and Roadway Crossings

The applicant estimates that it would take three months to relocate the 27-inch agricultural water pipeline described in Section 2.3.2.1. During the relocation period, one lane of Concordia Ranch Road and Temescal Canyon Road would be closed during the daytime. At night, both lanes would be open. Ingress and egress along Love Lane would not be obstructed, although Love Lane would be relocated west, away from the proposed Alberhill Substation site, as described in Section 2.3.2.1.

Relocation of the pipeline would be conducted in accordance with Elsinore Valley Municipal Water District requirements and encroachment permits obtained from the County of Riverside for crossing public ROWs. Traffic control would be implemented as described in Section 2.4.4.4 and in accordance with local ordinances and city permit conditions. See also, Section 2.4.4.6.

2.4.2 Land Disturbance for the Proposed Projects

~~2.4.2.1 Land Disturbance for the Valley–Ivyglen Project~~

~~Construction of the proposed Valley–Ivyglen Project would result in the disturbance of approximately 633.7 acres of land along the 115-kV subtransmission line route. The applicant estimates that approximately 141.5 acres would be disturbed permanently. Land disturbance estimates from implementation of the proposed Valley–Ivyglen Project are summarized in Table 2-5.~~

~~Land disturbance for 115-kV Segments VIG1 through VIG8 would occur primarily within public ROW but also on private property in some locations. There is no standard construction ROW width for the installation of subtransmission lines. The applicant would be required to obtain all necessary permits, easements, and approvals from local agencies and private parties prior to construction.~~

~~Table 2-5 Land Disturbance Estimates: Valley–Ivyglen 115-kV Subtransmission Line~~

~~Component (Quantity)~~	~~Disturbed Area Dimensions (length x width in feet)~~	~~Acres Disturbed During Construction~~	~~Acres Temporarily Disturbed~~	~~Acres Permanently Disturbed~~ [a]
~~Install lightweight-steel poles (514)~~	~~150 x 75~~	~~132.7~~	~~107.0~~	~~25.7~~
~~Install tubular steel poles (121)~~	~~200 x 150~~	~~83.3~~	~~76.0~~	~~7.3~~
~~Install hybrid poles (4)~~	~~150 x 75~~	~~1.0~~	~~0.8~~	~~0.2~~
~~Install guy poles (26)~~	~~50 x 50~~	~~1.5~~	~~1.5~~	~~<0.1~~
~~Install wood poles (16)~~	~~100 x 100~~	~~3.7~~	~~2.9~~	~~0.8~~
~~Remove wood poles (90 subtransmission line, 280 distribution line)~~ [b]	~~150 x 75~~	~~95.6~~	~~95.6~~	~~0.0~~
~~Install and remove shoofly line wood poles (10)~~ [c]	~~150 x 75~~	~~2.6~~	~~2.6~~	~~0.0~~
~~Install and remove guard structure wood poles (98)~~ [d]	~~50 x 75~~	~~8.4~~	~~8.4~~	~~0.0~~
~~Trenching for 115-kV line in new underground conduit (115-kV Segment VIG1)~~	~~300 x 300~~	~~2.1~~	~~2.1~~	~~0.0~~
~~Trenching for 115-kV line in new underground conduit (115-kV Segment VIG8)~~	~~10,094 x 50~~	~~11.6~~	~~11.6~~	~~0.0~~
~~Install underground vaults (9)~~	~~150 x 150~~	~~4.6~~	~~4.6~~	~~<0.1~~
~~Trenching for fiber optic line in new underground conduit~~	~~9,995 x 50~~	~~11.5~~	~~11.5~~	~~0.0~~
~~Staging Areas VIG2 through VIG6 and VIG8 through VIG14~~	~~n/a~~	~~75.0~~	~~75.0~~	~~0.0~~
~~Access road construction~~	~~14 miles x 22 feet~~ [e]	~~95.0~~	~~0.0~~	~~95.0~~
~~Additional disturbance area for access road construction along 115-kV Segments VIG1 and VIG6~~	~~1 mile x 200 feet~~ [f]	~~24.0~~	~~12.0~~	~~12.0~~
~~Retaining walls, 8 feet high for access roads~~	~~2,200 feet x 20~~	~~1.0~~	~~0.5~~	~~0.5~~
~~Sites for conductor stringing, pulling, tensioning, or splicing (90)~~	~~up to 500 x 100~~ [g]	~~77.5~~	~~77.5~~	~~0.0~~
~~Sites for fiber optic line stringing, pulling, tensioning, or splicing (90)~~	~~60 x 20~~ [g]	~~2.5~~	~~2.5~~	~~0.0~~
~~Trenching for relocation of up to 2,500 feet of distribution underground~~	~~2,500 x 2~~	~~0.1~~	~~0.1~~	~~0.0~~
	~~Total disturbance~~	~~633.7 acres~~	~~492.2 acres~~	~~141.5 acres~~

~~Sources: SCE 2013, 2014~~
~~Key: kV = kilovolt, VIG = Valley–Ivyglen~~

~~Notes:~~

~~[a] The estimated permanent disturbance areas that would be maintained around each of the proposed structures are as follows: lightweight-steel and wood poles = 2,178 square feet each (less than 75-feet long by 30-feet wide); tubular steel and hybrid poles = 2,614 square feet each (less than 75-feet long by 35-feet wide); guy poles = 9 square feet each (approximately 3-feet long by 3-feet wide). Vaults are conservatively assumed to result in a disturbed area of 400 square feet (20 feet by 20 feet) for maintenance access.~~

~~[b] Includes trenching for the replacement of 35 distribution-line riser poles as described in Section 2.4.5.3.~~

~~[c] A shoofly is a temporary electrical line used during construction activities to maintain electrical service to an area while allowing sections of a permanent line that requires modification to be taken out of service.~~

~~[d] Guard structures are temporary structures designed to catch the conductor should it drop below the required stringing height.~~

~~[e] Approximately 14 miles of new or modified access roads would be constructed. Access road widths would vary from approximately 24 feet wide to 28 feet wide (including shoulders) depending on terrain, curves, drainage, and turnaround requirements. In some locations, the permanent graded area would be as wide as 100 feet, and temporary disturbance areas may be as wide as 200 feet. The applicant estimates that approximately 70 percent of the access roads would be 18 feet wide (or less). For the land disturbance estimates provided in this table, it is estimated that each access road would be approximately 22 feet wide.~~

~~[f] Additional permanent and temporary disturbance areas are anticipated to be required for vehicle turnaround and positioning during access road construction due to hilly terrain along sections of 115-kV Segments VIG1 and VIG6. Permanent, graded disturbance areas may be as wide as 100 feet, and temporary disturbance areas may be as wide as 200 feet. For the land disturbance estimates provided in this table, it is estimated that up to a total of 1 mile along 115-kV Segments VIG1 and VIG6 would require these additional land disturbance dimensions.~~

~~[g] The applicant estimates that the wire-stringing sites would range in length from 200 feet to 500 feet and range in width from 34 feet to 100 feet. For the land disturbance estimates provided in this table, it is estimated that each wire-stringing site would be approximately 375 feet long by 100 feet wide. The applicant estimated that each conductor reel would hold approximately 6,500 feet of conductor for the disturbance estimate provided and noted that topography and route design would also affect the number of sites needed. The same estimate (90 sites) was applied for the number of fiber optic line wire-stringing sites that may be needed.~~

2.4.2.2 Land Disturbance for the Alberhill Project

Construction of the Alberhill Project would result in the permanent disturbance of approximately ~~109.5~~ 58.1 acres of land~~ if the Conventional Method of construction is used and approximately 68.8 acres of land if maximum Helicopter Construction is used~~.

115-kV Segments ASP1 through ASP8, Alberhill Substation

Construction of 115-kV Segments ASP1 through ~~ASP 8~~ASP8 and the Alberhill Substation would result in the permanent disturbance of approximately ~~66.3~~47.3 acres of land. Land disturbance estimates for these project components are summarized in Table 2-6. The 115-kV general disturbance area, as described in Section 2.4.2.3 is depicted on Figure 2-6.

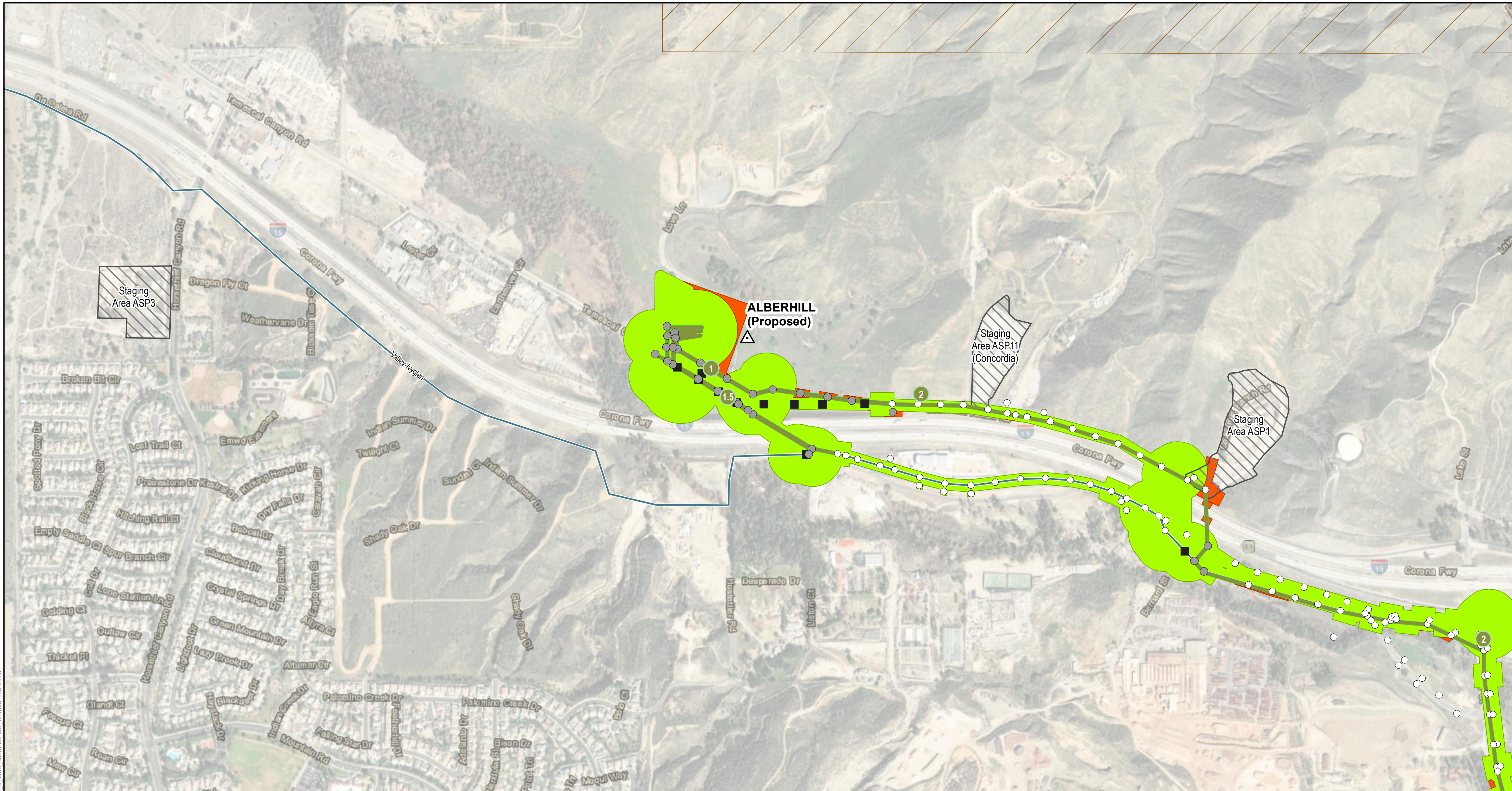
The applicant has acquired approximately 124 acres of land and would use ~~about 34~~between 39 and 44 acres for construction of the proposed Alberhill Substation ~~and~~(depending on the soil import option selected) and portions of 115-kV Segment ASP1 and ASP1.5 as follows:

- ~~24~~23 acres of land would be within the substation wall (Figure 2-7).
- ~~4~~9 acres of land immediately outside the substation perimeter wall to the west, east, and south would be used for subtransmission and transmission line access, vehicular access, landscaping, water pipeline relocation, and buffer.[11]
- ~~6~~7 to 12 acres located outside of the north substation wall, plus the northeast and northwest corners would be primarily dedicated to the control of storm water runoff, depending on the soil import option selected.

If the applicant elects to excavate 5.2 acres of land adjacent to the northeast corner of the proposed Alberhill Substation site to obtain fill required for grading, then the land required for construction of the proposed substation would increase from ~~34~~39 acres to approximately ~~40~~44 acres Section 2.4.6.2). In addition, pending approval of the proposed Alberhill Project, the applicant would acquire ~~99 acres~~necessary ROW in easement and/or in fee outside the proposed Alberhill substation from ~~four~~ private property owners ~~and Riverside County~~ for construction of the 500 kV transmission lines. Land disturbance for the proposed Alberhill Substation and 500 kV transmission lines would be away from public streets, ~~but~~and each 500 kV transmission line would require a 200-foot-wide ROW.

Land disturbance for 115-kV Segments ASP1.5 through ASP8 would occur primarily within public ROW ~~but~~and also on private property in some locations. ~~There is no standard construction~~The final ROW width ~~for the installation~~and total number of ~~subtransmission lines.~~land rights to be acquired would be determined upon completion of final engineering. The applicant would be required to obtain all necessary ~~permits, easements,~~land and ~~approvals~~ easement rights, from ~~local agencies and~~ private ~~parties~~property owners prior to construction. Additionally, temporary land rights would be acquired for construction work areas, pulling sites, helicopter landing platforms/pads, access roads, laydown and marshalling yards. The total number of temporary land rights needed would be determined upon final engineering. Pursuant to Cal. Pub. Util. Code section 612, SCE also has the power of eminent domain to acquire any necessary land rights for construction of the Proposed Project.

[11] The buffer would be a 10-foot-wide belt maintained around the substation's proposed perimeter wall that excludes structures and vegetation that could be used to access the inside of the proposed substation.



ASP Segment

Existing Pole/Structure

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Staging Area

Alberhill Substation

Stephens' Kangaroo Rat Core Reserve Area

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

a b c d e f g h i j k

Figure 2-6a
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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ASP Segment

Existing Pole/Structure

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

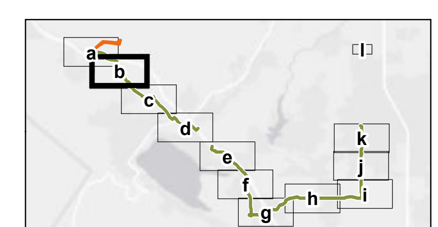

Figure 2-6b
115-kV General Disturbance Area

Alberhill System Project

Feet
0 400 800

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ASP Segment

Existing Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Existing Substation

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

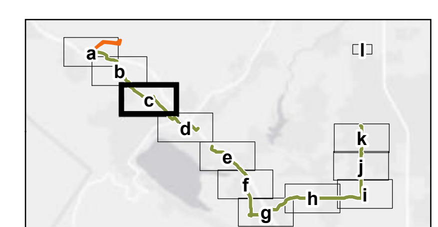

Figure 2-6c
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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Figure 2-6d
115-kV General Disturbance Area

Alberhill System Project

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ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Existing Overhead Idle 115 kV Subtransmission Line

Existing Substation

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

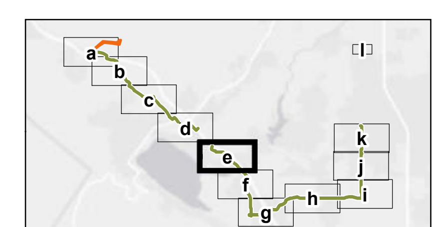

Figure 2-6e
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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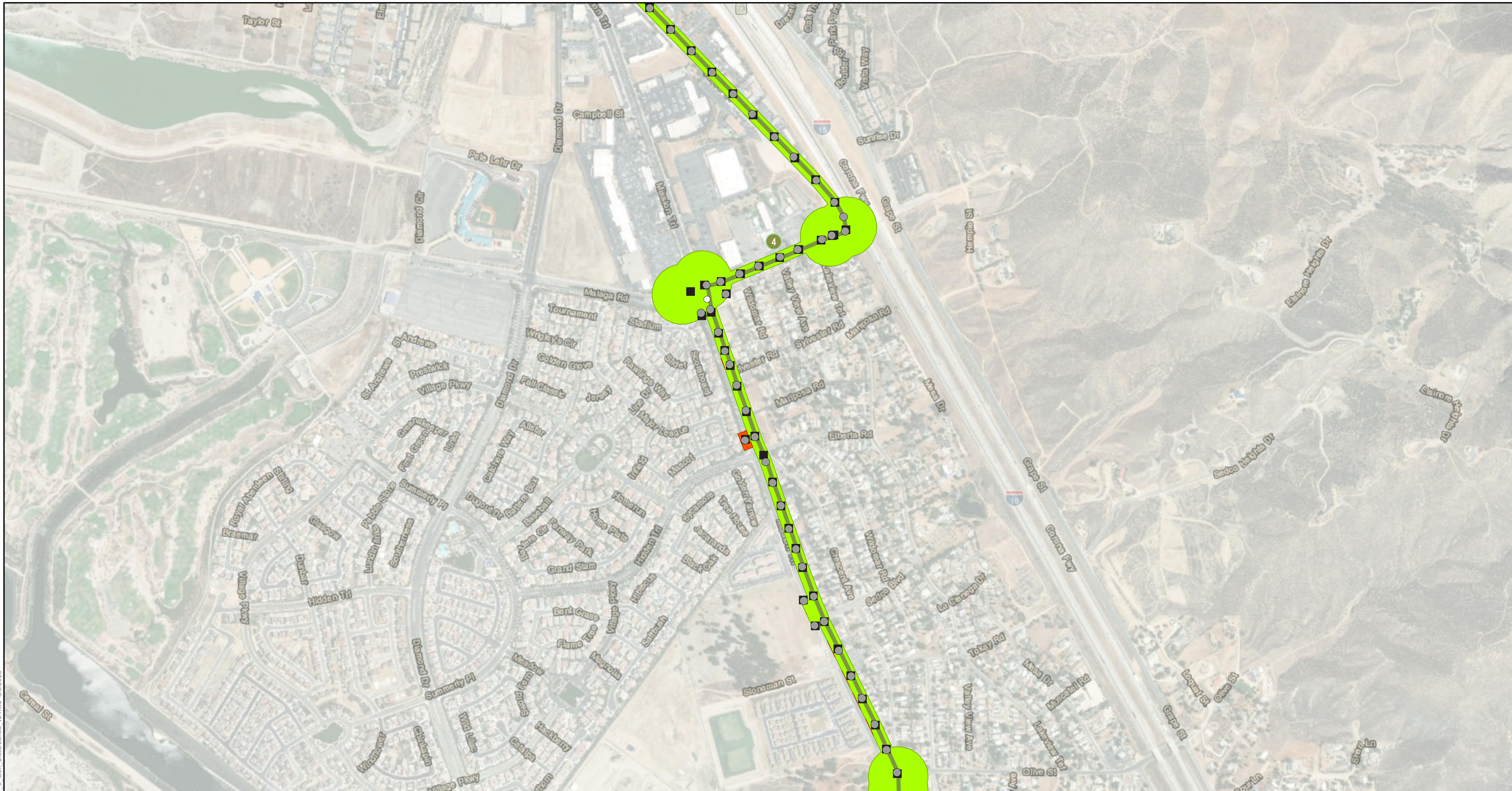

ASP Segment

Existing Pole/Structure

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

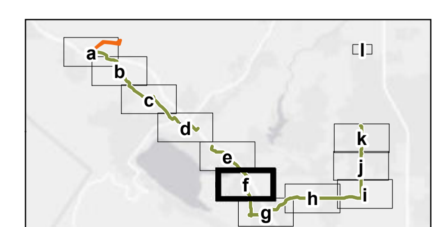

Figure 2-6f
115-kV General Disturbance Area

Alberhill System Project

Feet
0 400 800

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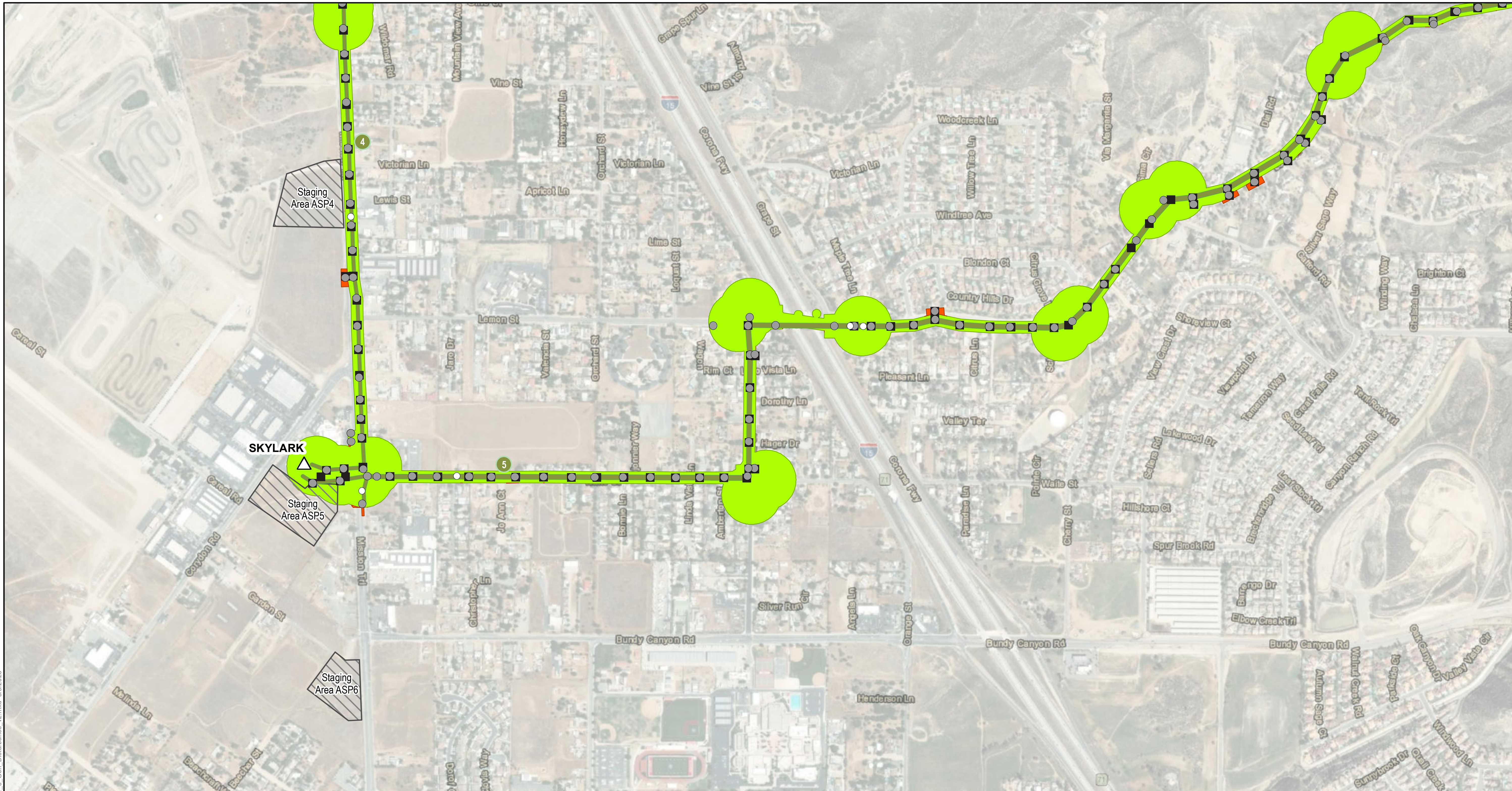

ASP Segment
Existing Pole/Structure
New/Modify Pole/Structure
Remove Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Staging Area
Existing Substation
Additional 115 kV Disturbance Area
115 kV General Disturbance Area

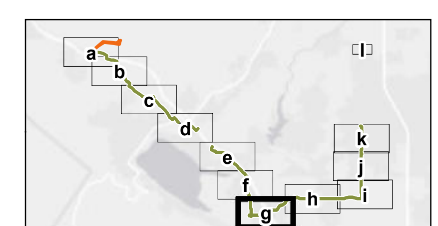

Figure 2-6g
115-kV General Disturbance Area

Alberhill System Project

Feet
0 400 800

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ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Staging Area

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

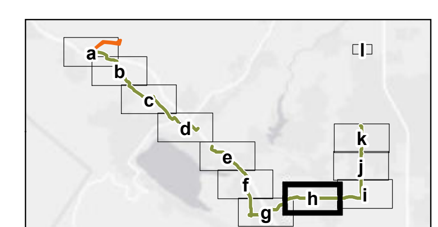

Figure 2-6h
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Staging Area

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

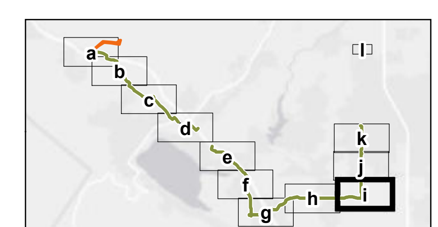

Figure 2-6i
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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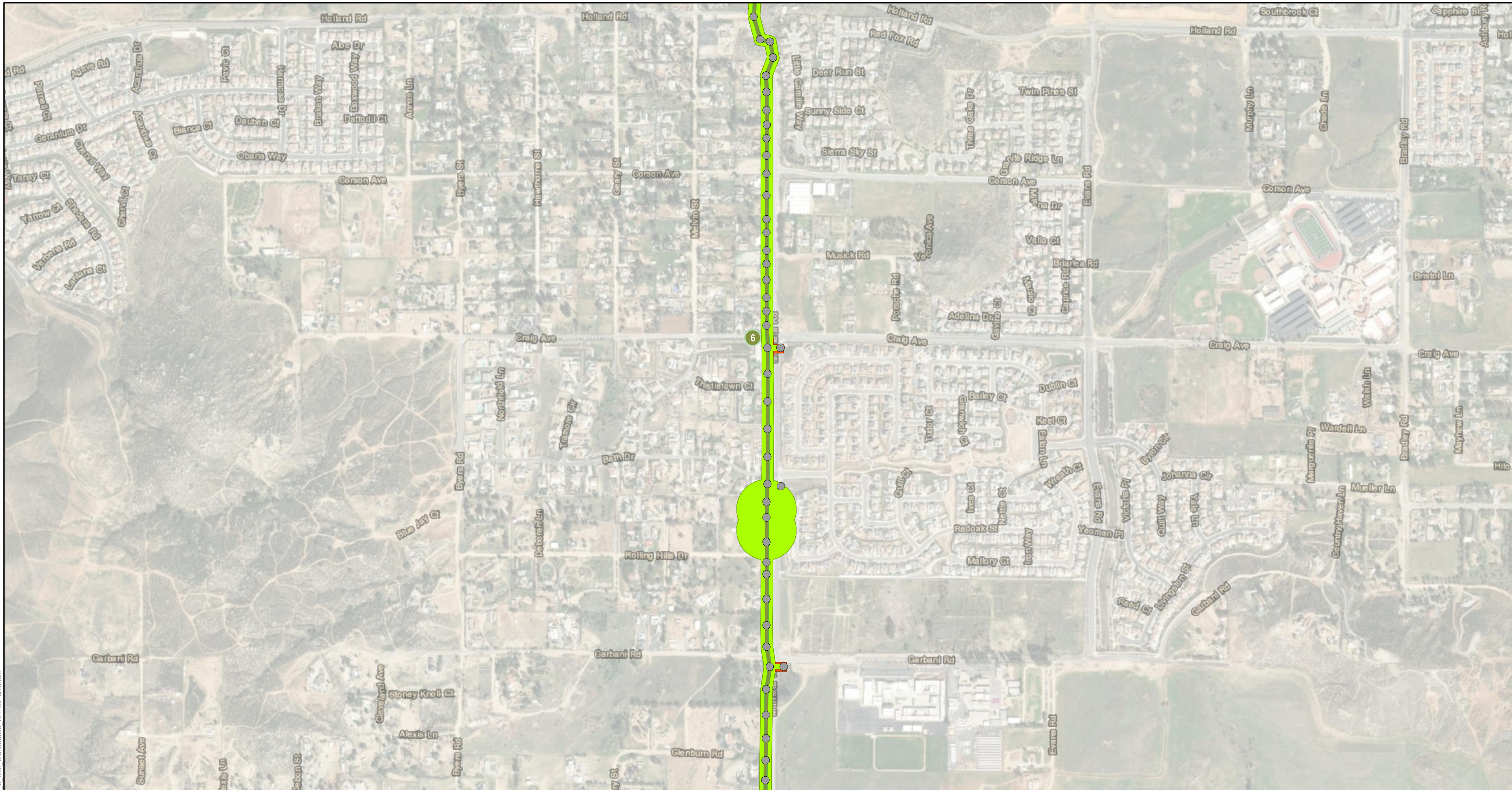

ASP Segment
New/Modify Pole/Structure
Proposed Overhead 115 kV Subtransmission Line
Additional 115 kV Disturbance Area
115 kV General Disturbance Area

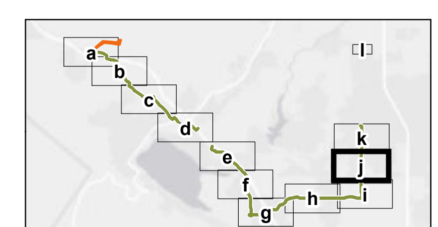

Figure 2-6j
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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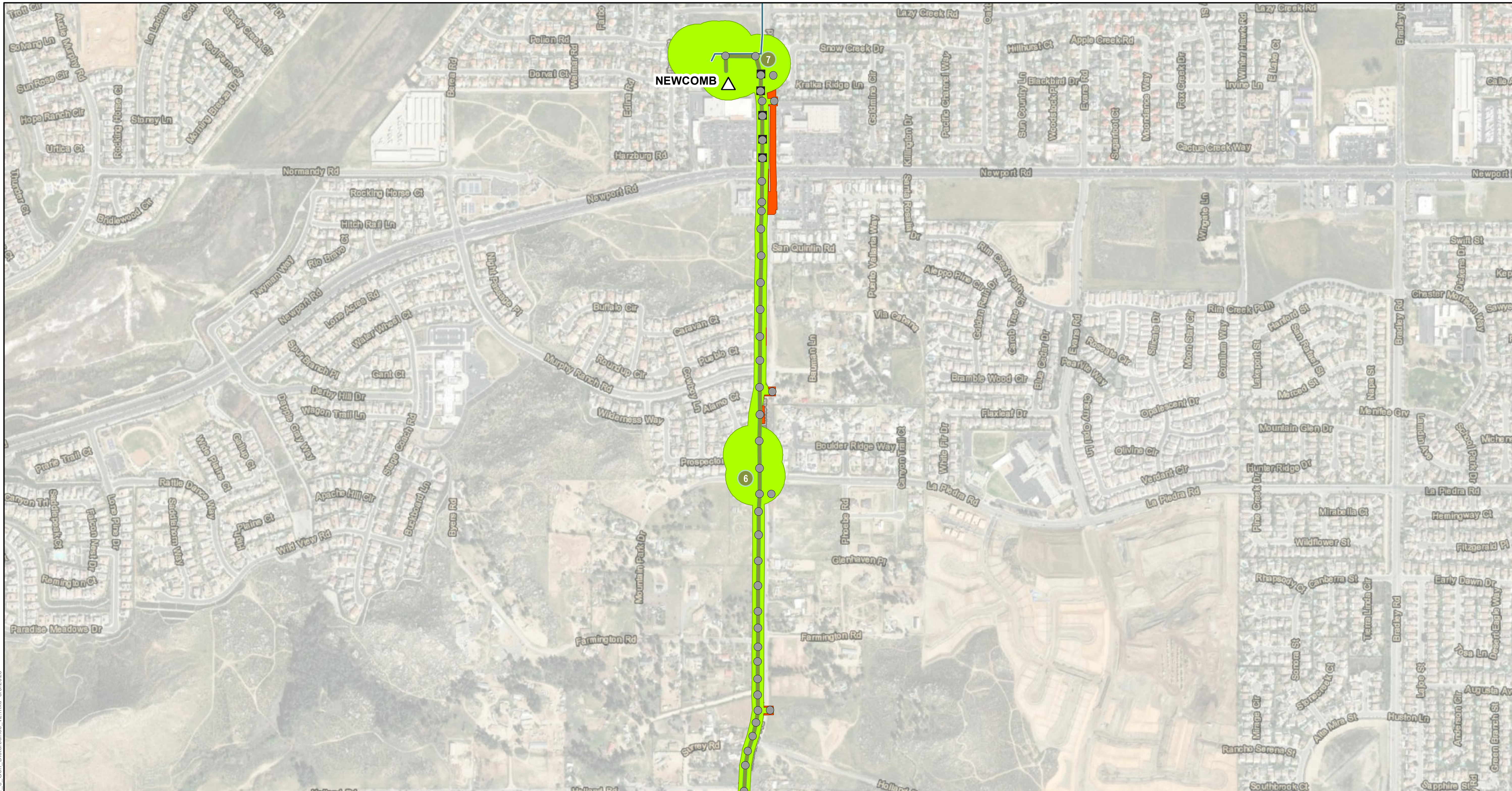

ASP Segment

New/Modify Pole/Structure

Remove Pole/Structure

Proposed Overhead 115 kV Subtransmission Line

Existing Overhead 115 kV Subtransmission Line

Existing Substation

Additional 115 kV Disturbance Area

115 kV General Disturbance Area

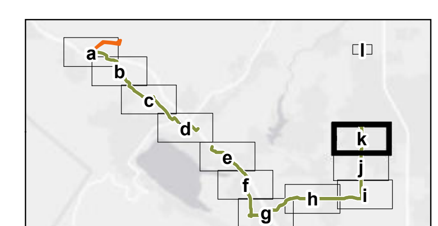

Figure 2-6k
115-kV General Disturbance Area

Alberhill System Project

0 400 800 Feet

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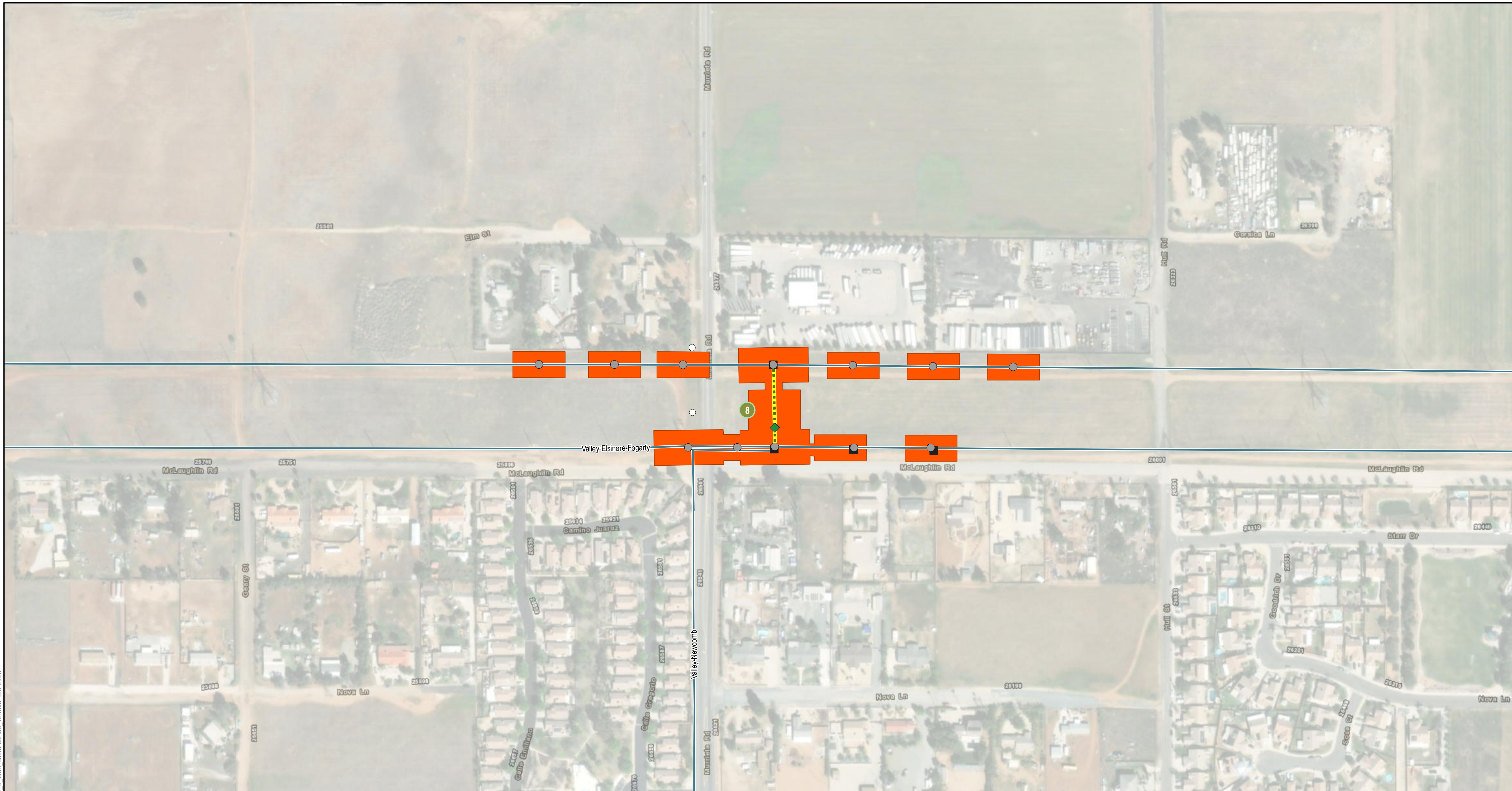

ASP Segment
Existing Pole/Structure
New/Modify Pole/Structure
Remove Pole/Structure
Proposed 115 kV Cable in New Underground Duct Bank
Existing Overhead 115 kV Subtransmission Line
New 115 kV Underground Vault
Additional 115 kV Disturbance Area

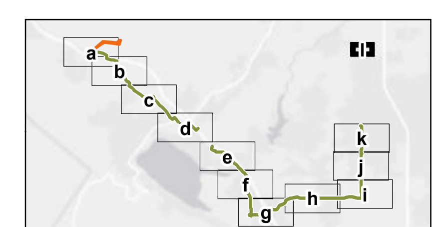

Figure 2-6l
115-kV General Disturbance Area

Alberhill System Project

Feet
0 100 200

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Figure 2-7 Alberhill Substation Layout and Water Pipeline Relocation

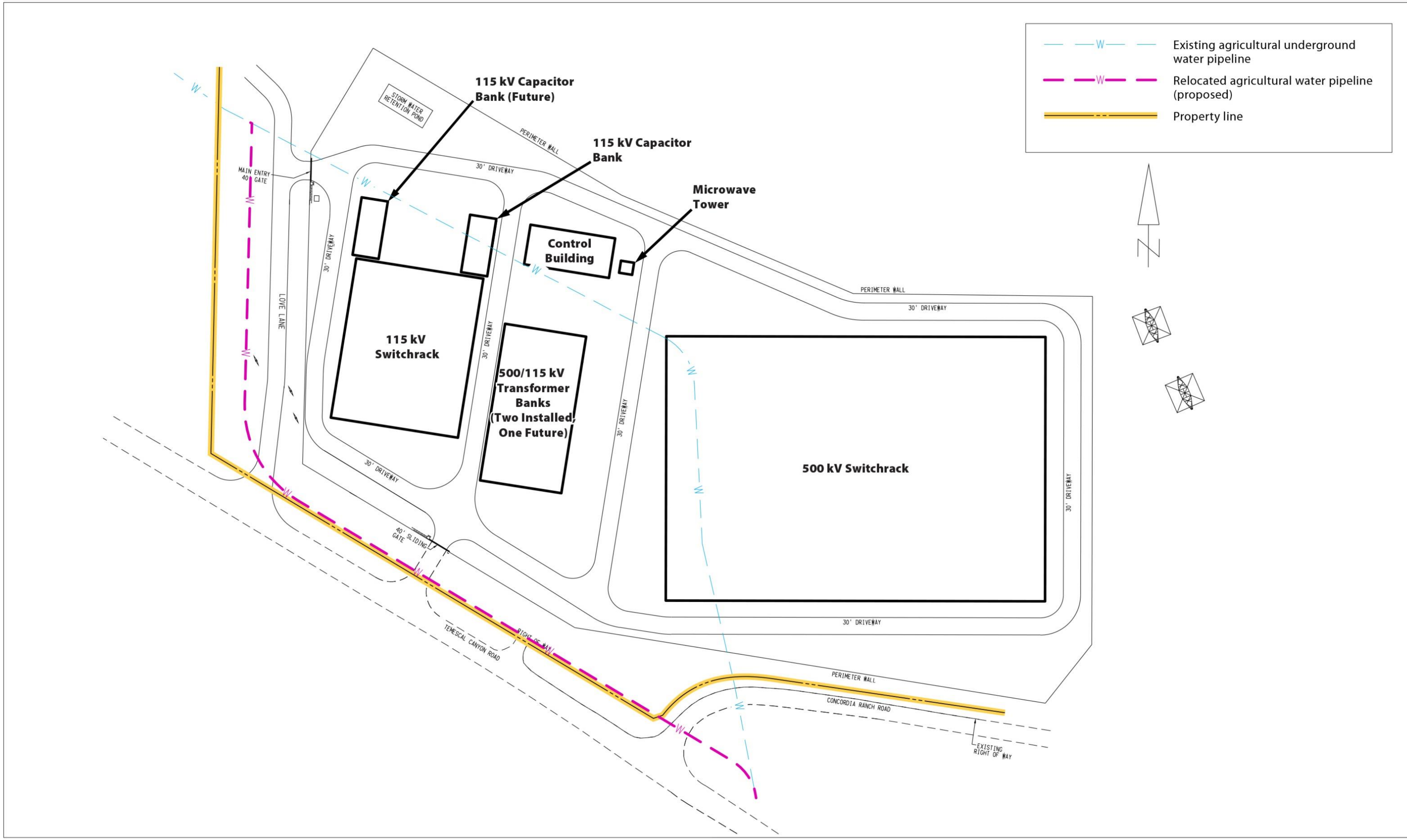

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Figure 2-8 Transmission and Subtransmission Structures and Microwave Antenna Tower (Alberhill Project)

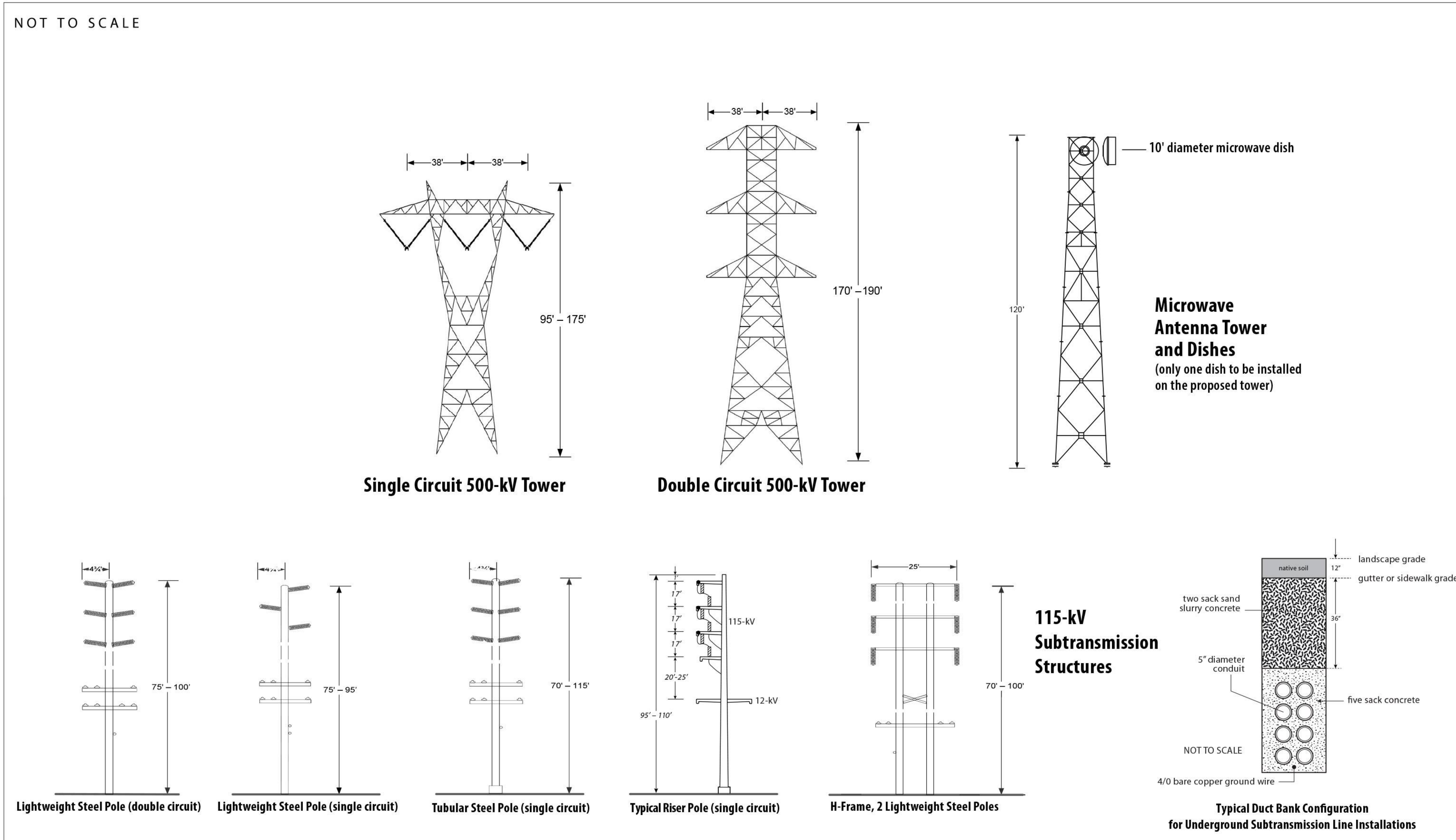

Figure 2-9 Typical Microwave Antenna Tower

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Table 2-6 Land Disturbance Estimates: Alberhill Substation and 115-kV Segments ASP1 through ASP8

Component (Quantity)	~~Disturbed Area~~Typical Workspace Dimensions (length x width in feet)	Acres Disturbed During Construction [h]	Acres Temporarily Disturbed	Acres Permanently Disturbed [a.]
Proposed Alberhill Substation, Portions of 115-kV ~~Segment~~Segments ASP1 and ASP1.5, and Import Source Soil Area[f]	**N/A**	**~~42.9~~46.0**	**~~0~~3.5**	**~~42.9~~42.5**
Install lightweight-steel poles (~~346~~308)	150 x 75 [e.]	~~89.3~~ ~~35.1~~ ~~0.7~~ ~~1.7~~ ~~9.3~~ ~~2.7~~ ~~1.4~~ ~~1.8~~ ~~0.8~~ ~~67.1~~ ~~0.9~~ ~~0.2~~ 149.1	~~72.0~~ ~~32.0~~ ~~0.5~~ ~~1.2~~ ~~7.5~~ ~~2.5~~ ~~1.3~~ ~~1.8~~ ~~0.8~~ ~~67.1~~ ~~0.9~~ ~~0.2~~ 144.3	~~17.3~~ ~~3.1~~ ~~0.2~~ ~~0.5~~ ~~1.8~~ ~~0.2~~ ~~0.1~~ ~~0.0~~ ~~0.0~~ ~~0.0~~ ~~0.0~~ ~~0.0~~ 4.8
Install tubular steel poles (~~51~~35)	200 x 150 [e.]			
~~Install wood poles (3)~~	~~100 x 100~~			
Install lightweight-steel H-frame structures (10)	150 x ~~50~~75 [e.]			
Install lightweight~~-~~-steel pole guy stubs (~~36~~35)	150 x 75 [e.]			
Existing ~~TSPs~~lightweight-steel poles to be modified (~~4~~6)	~~200 x 150 e.~~150 x 75			
~~Install~~Existing TSPs ~~(~~to be modified~~) (2)~~ (12)	200 x ~~150~~100 ~~e.~~			
Existing wood poles to be modified (6)	150 x 75			
Replace existing TSP (1)	200 x 100			
Remove lightweight~~-~~-steel poles (7)	150 x 75			
Remove tubular steel poles (~~3~~6)	~~150~~200 x ~~75~~100			
Remove wood poles (~~260~~236)	150 x 75			
Remove lightweight-steel H-frame structures (~~8~~7)	150 x 75			
Remove wood H-~~frames (2)~~frame structures (3)	~~100~~150 x ~~50~~75			
Install and remove guard structure wood poles (~~3~~65 sites) [b.]	50 x 75	~~0.3~~2.3	~~0.3~~2.3	0.0
Install new anchors (10 sites)	25 x 25	0.1	0.1	<0.1
Trenching for 115-kV line in new underground conduit (115-kV Segment ASP2)	300 x 50	0.1	0.1	0.0
Trenching for 115-kV line in new underground conduit (115-kV Segment ASP8)	250 x 50	< 0.1	<0.1	0.0
Install underground vault (1)	150 x 150	0.4	0.4	<0.1

Component (Quantity)	~~Disturbed Area~~Typical Workspace Dimensions (length x width in feet)	Acres Disturbed During Construction [h]	Acres Temporarily Disturbed	Acres Permanently Disturbed [a]
115-kV wire stringing (~~9~~122 sites)	200 x 50	~~2.1~~17.9	~~2.1~~17.9	0.0
Staging areas [d]	N/A	~~31.8~~53.0	~~31.8~~53.0	0.0
Trenching for fiber optic line installation	~~5,808~~4,300 x 1.5	~~0.2~~2.1	~~0.2~~2.1	0.0
Fiber optic line stringing, pulling, tensioning, or splicing (72 sites)	90 x 20	0.6	0.6	0.0
Install underground manhole (4 sites)	150 x 150	1.1	1.1	0.0
~~Access Road on 115-kV Segment ASP5~~	~~325 x 26~~	~~0.2~~	~~0.0~~	~~0.2~~
Portions of 115-kV Segments ASP1 and ASP1.5 and 115-kV Segments ASP2 through ASP8 total [g]		**~~245.46~~228.9 acres**	**~~222.2~~224.1 acres**	**~~23.24~~4.8 acres**
Total (115-kV Subtransmission Lines and Substation) [i]		**~~288.35~~274.9 acres**	**~~222.2~~227.5 acres**	**~~66.13~~47.3 acres**

~~Sources: SCE 2011, 2013~~

Key: ASP = Alberhill System Project, kV = kilovolt, LWS = Lightweight Steel, ROW = right-of-way, TSP = Tubular Steel Pole

Notes:

a The estimated permanent disturbance areas that would be maintained around each of the proposed structures are as follows: lightweight steel, lightweight steel pole guy stub, and wood poles = ~~2,178~~315 square feet each (~~less than 75 feet long by 30 feet wide~~10-foot radius); tubular steel poles and modified tubular steel poles = ~~2,614~~1,960 square feet each (~~less than 75 feet long by 35 feet wide~~50-foot radius); guy poles = 9 square feet each (approximately 3 feet long by 3 feet wide).

b Guard structures are temporary structures designed to stop the movement of a conductor should it drop below the required stringing height.

c The proposed H-frame structures would be constructed of two LWS poles.

d For the purposes of this document, it is assumed that the applicant may use any of the staging areas identified by the applicant for construction of the proposed 115-kV subtransmission lines (i.e., all staging areas except Staging Area ASP2). The Primary Staging Area (the footprint of the Alberhill Substation site) is not included in this total because it would already be disturbed as part of substation construction. Staging Areas ASP1 and ASP2 are accounted for in Tables 2-7 and 2-8. This total therefore represents the area of all staging areas identified in Table 2-9, except Staging Areas ~~ASP3 through ASP8 as well as the area of Staging Area ASP7 that is already used for storing materials~~ASP1 and ASP2. Fewer staging areas would likely be required during construction. See Section 2.4.3.2.

e The dimensions of the estimated disturbed area for TSP and LWS pole construction include the laydown area for assembly of the structure.

f As described in Section 2.4.6.2, the applicant would either truck in ~~80,000~~70,000 cubic yards of soil or excavate the soil from a 5.2-acre area located adjacent to the northeast side of the proposed Alberhill Substation site (Figure 2-~~2x~~2a). The Import Soil Source Area is located under the proposed 500-kV transmission line routes near 500-kV Towers SA1 and VA1. For the purposes of this document, it is assumed that regardless of the import soil option selected by the applicant, the 5.2-acre area would be permanently disturbed. The installation of five new LWS poles and four new TSPs associated with 115-kV Segments ASP1 and ASP1.5 have been included in this summary.

g. Portions of 115-kV Segments ASP1 and ASP1.5 located off the substation parcel have been included in this summary.

h. The anticipated overlap between disturbance areas has been removed.

i. Due to rounding, the final total may not equal the sum of the individual components.

500 kV Transmission Lines

~~*Conventional Method*~~

Construction of the proposed Alberhill Project ~~using the Conventional Method~~ would result in the permanent disturbance of approximately ~~21.6~~10.8 acres of land along the 500 kV transmission line. Land disturbance estimates from implementation of the ~~proposed Alberhill~~Proposed Project using the ~~Conventional Method to construct the 500-kV transmission line~~conventional method of construction for nine towers and helicopter method for three towers are summarized in Table 2-7.

~~*Helicopter Construction*~~

~~Construction of the proposed Alberhill Project using Helicopter Construction would result in the disturbance of approximately 2.5 acres of land along the 500-kV transmission line routes. Land disturbance estimates from implementation of the proposed Alberhill Project are summarized in Table 2-8.~~

2.4.2.3 115-kV General Disturbance Areas

~~Final~~Although temporary construction areas have been defined to facilitate construction of the 115-kV segments, final engineering for the ~~proposed projects~~Proposed Project has not been completed. For this reason, the applicant has provided large, general disturbance areas for the ~~proposed projects~~Proposed Project to ensure that the required flexibility would be available during construction and for final siting of the proposed 115 kV facilities. The Alberhill 115 kV General Disturbance Area is approximately 505 acres~~, and the Valley–Ivyglen 115-kV General Disturbance Area is approximately 1,335 acres~~ (Figures 2-6a to 2-~~6d~~6k). In some instances, additional temporary construction areas (approximately 16.5 acres) would be required outside of the previously identified general disturbance area. These additional disturbance areas are depicted on Figures 2-6a to 2-6l. A general disturbance area was not identified for the other components of the ~~proposed Alberhill~~Proposed Project (i.e., the proposed Alberhill Substation and 500 kV transmission lines) because more detailed final engineering was ~~not~~ provided by the applicant prior to completion of this document.

~~Disturbance~~General disturbance areas for the ~~proposed projects~~Proposed Project would typically vary between ~~50~~100 feet wide and 150 feet wide along the proposed 115 kV ~~routes~~segments (50 feet to 75 feet on each side of centerline) depending on the type of structure to be installed or construction activity to be completed (Tables 2-5 and 2-6~~7~~). In some locations, however, the potential disturbance area evaluated within this document is substantially wider (e.g., 1,000 or more feet wide) because of anticipated access constraints and because final engineering has not been completed. The actual amount of disturbance in these locations is anticipated to be substantially less than the area evaluated.

The size of the 115-kV disturbance area evaluated in this document is specific to the resource area that may be impacted. For impacts on biological resources, for example, it is assumed that the entire 115-kV general disturbance area would be disturbed. This approach ensures that the evaluation accounts for the full extent of impacts that could occur to various species. For impacts on air quality, however, it is not assumed that the entire 115-kV general disturbance area would be disturbed.

Activities that may occur within the 115 kV general disturbance area could include, but would not be limited to, equipment and materials staging, equipment and materials laydown adjacent to the proposed 115 kV structures, access road construction, removal, foundations, assembly, erection and wire stringing. ~~In addition, helicopter landing and materials delivery by helicopter could occur within the Valley–Ivyglen 115-kV General Disturbance Area along 115-kV Segments VIG1 and VIG4 to VIG7.~~ Each of the staging areas described in Section 2.4.3.1 that may be used for construction of the proposed 115 kV facilities are included within the 115 kV general disturbance area ~~respective to the associated project~~. It is assumed

Table 2-7 ~~Conventional Method~~ Land Disturbance Estimates: 500-kV Transmission Lines

Component (Quantity)	~~Disturbed~~Typical Workspace Area Dimensions (length x width in feet)	Acres Disturbed During Construction [a], [h]	Acres Restored	Acres Permanently Disturbed
Remove 500-kV tower (1)	150 x 150	~~0.5~~0.0	~~0.5~~0.0	0.0
Install 500-kV towers ~~(12)~~conventionally (9)	200 x 200 [c]	~~11.0~~9.0	~~8.6~~6.7	~~2.4~~2.3
Install 500-kV towers with helicopter (3)	150 x 150			
Access existing 500-kV towers (4)	200 x 200			
~~500-kV wire-stringing (5 sites) d.~~Construct helicopter landing platforms (3)	~~150~~50 x 50	~~0.9~~< 0.1	~~0.9~~0.0	~~0.0~~< 0.1
500-kV ~~string/tensioning (3 sites)~~wire-stringing/setup (8 sites)[d]	~~500~~150 x ~~150~~50	~~5.2~~1.7	~~5.2~~1.7	0.0
New or modified access roads (3.4 ~~6.1~~ miles)	~~6.1~~3.4 miles x 26 feet [e]	~~60~~11.2	~~51.141.4~~2.8	~~9.519.2~~8.4
Staging areas [f]	N/A	~~10.6~~9.3	~~10.6~~9.3	0.0
Total 500-kV transmission lines disturbance [i]	**~~88.8~~31.4 acres**	**~~67.2~~20.1 acres**	**~~21.6~~10.8 acres**	

~~Sources: SCE 2011, 2013~~

Key: ASP = Alberhill System Project, kV = kilovolt, ROW = right-of-way

Notes:

a The disturbed acreage calculations are estimates based on the applicant's work area requirements and width of the proposed ROW.

b As described in Section 2.4.6.2, the applicant would either truck in ~~80,000~~70,000 cubic yards of soil or excavate the soil from a 5.2-acre area located adjacent to the northeast side of the proposed Alberhill Substation site. The Import Soil Source Area is located under the proposed 500-kV transmission line routes near 500-kV Towers SA1 and VA1. For the purposes of this document, it is assumed that regardless of the import soil option selected by the applicant, the 5.2-acre area would be permanently disturbed.

c The dimensions of the disturbed area for this component include the laydown area for assembly of the tower. Tower installation may require the construction of permanent crane pads. If pads are required, they would each occupy an area of approximately 50 feet by 50 feet and may extend outside of the 200-foot-wide ROW in proximity to some 500-kV tower locations. The total area of disturbance, however, would not exceed 200 ~~square feet~~ foot by 200-foot area for each 500-kV tower.

d To minimize the disturbance area, a technique called slack spanning would be used along portions of the 500 kV transmission line (Section 2.4.5.6).

e Access road widths would vary from approximately 24 feet wide to 28 feet wide (including shoulders) depending on terrain, curves, drainage, and turnaround requirements. In some locations, the permanent graded area would be as wide as 100 feet and temporary disturbance areas may be as wide as 200 feet. The applicant estimates that approximately 70 percent of the access roads would be 18 feet wide (or less). For the land disturbance estimates provided in this table, it is estimated that each access road would be approximately 26 feet wide at buildout. Temporary disturbance accounts for the potential for BMP installation, clearing, grubbing, and cut and fill slopes that would be revegetated after construction is complete. This very conservatively accounts for a disturbance area that is up to 200 feet wide for 2.5 miles.

f For the purposes of this document, it is assumed that the applicant would use Staging Area ASP1 and ASP2 as well as the Primary Staging Area (the footprint of the Alberhill Substation site). Acreage in this row is only ASP1 and ASP2; the Substation Site acreage is included in ~~a separate row. See~~ Table 2-6.

g Additional permanent and temporary disturbance areas are anticipated to be required for vehicle turnaround and positioning during access road construction due to hilly terrain along the proposed 500-kV transmission line routes. Permanent, graded disturbance areas may be as wide as 200 feet, and temporary disturbance areas may be as wide as 500 feet. For the land disturbance estimates provided in this table, it is estimated that up to a total of 3.4 miles of access roads to the proposed 500-kV would require these additional land disturbance dimensions.

h. The anticipated overlap between disturbance areas has been removed.

i. Due to rounding, the final total may not equal the sum of the individual components.

~~Table 2-8 Helicopter Construction: 500-kV Transmission Lines~~

~~Component (Quantity)~~	~~Disturbed Area Dimensions (length x width in feet)~~	~~Acres Disturbed During Construction a.~~	~~Acres Restored~~	~~Acres Permanently Disturbed~~
~~Remove 500-kV tower (1)~~	~~150 x 150~~	~~0.5~~	~~0.5~~	~~0.0~~
~~Install 500-kV towers conventionally (4)~~	~~200 x 200 c.~~	~~3.7~~	~~2.9~~	~~0.8~~
~~Install 500-kV towers with helicopter (4)~~	~~150 x 150~~	~~4.1~~	~~2.5~~	~~1.6~~
~~Construct helicopter landing platform (5)~~	~~50 x 50~~	~~0.3~~	~~0.2~~	~~0.1~~
~~500-kV wire-stringing (5 sites) d.~~	~~150 x 50~~	~~0.9~~	~~0.9~~	~~0.0~~
~~500-kV string/tensioning (3 sites)~~	~~500 x 150~~	~~5.2~~	~~5.2~~	~~0.0~~
~~Staging areas f.~~	~~N/A~~	~~10.6~~	~~10.6~~	~~0.0~~
~~Total 500-kV transmission lines disturbance~~		**~~25.3 acres~~**	**~~22.8 acres~~**	**~~2.5 acres~~**

~~Sources: SCE 2011, 2013~~
~~Key: ASP = Alberhill System Project, kV = kilovolt, ROW = right-of-way~~
~~Notes:~~

~~a The disturbed acreage calculations are estimates based on the applicant's work area requirements and width of the proposed ROW.~~

~~b As described in Section 2.4.6.2, the applicant would either truck in 80,000 cubic yards of soil or excavate the soil from a 5.2-acre area located adjacent to the northeast side of the proposed Alberhill Substation site (Figure 2-2x). The Import Soil Source Area is located under the proposed 500-kV transmission line routes near 500-kV Towers SA1 and VA1. For the purposes of this document, it is assumed that regardless of the import soil option selected by the applicant, the 5.2-acre area would be permanently disturbed.~~

~~c The dimensions of the disturbed area for this component include the laydown area for assembly of the tower. Tower installation may require the construction of permanent crane pads. If pads are required, they would each occupy an area of approximately 50 feet by 50 feet and may extend outside of the 200-foot-wide ROW in proximity to some 500-kV tower locations. The total area of disturbance, however, would not exceed 200 square feet for each 500-kV tower.~~

~~d To minimize the disturbance area, a technique called slack spanning would be used (Section 2.4.5.6).~~

~~e Access road widths would vary from approximately 24 feet wide to 28 feet wide (including shoulders) depending on terrain, curves, drainage, and turnaround requirements. In some locations, the permanent graded area would be as wide as 100 feet and temporary disturbance areas may be as wide as 200 feet. The applicant estimates that approximately 70 percent of the access roads would be 18 feet wide (or less). For the land disturbance estimates provided in this table, it is estimated that each access road would be approximately 26 feet wide.~~

~~f For the purposes of this document, it is assumed that the applicant would use Staging Area ASP1 and ASP2 as well as the Primary Staging Area (the footprint of the Alberhill Substation site). Acreage in this row is only ASP1 and ASP2; the Substation Site is included in a separate row. See Table 2-6.~~

that footprint of each staging area would be fully disturbed. The locations where other construction activities would occur within the general disturbance areas have not yet been identified by the applicant.

2.4.3 Staging Areas for the Proposed Projects

Temporary staging areas would be used to stage equipment and materials during construction. The areas would be used as a reporting location for workers, and for vehicle and equipment parking, worker parking, and material storage. The areas may have offices for supervisory and clerical personnel. Routine construction equipment maintenance would be conducted at staging areas. Materials and equipment typically managed at staging areas would include, but not be limited to, construction trailers, construction equipment, steel, conductor, wire reels, cable, hardware, insulators, signage, fuel, joint compound, and other consumable materials.

Staging areas may also be established at the following substation sites: Ivyglen, Fogarty, Skylark, Alberhill, Newcomb, and Valley. The applicant has committed to the following with regard to staging areas:

- Delivery activities requiring extensive street use would be scheduled to occur during off-peak traffic hours to the extent feasible in accordance with applicable local ordinances.
- All materials associated with construction of the ~~proposed projects~~Proposed Project would be delivered by truck or helicopter to each work site from an established staging area. Helicopters may land at the proposed Alberhill Substation site, Staging Areas ASP1 to ASP3, and Staging Area ASP11 ~~any of the Valley–Ivyglen Project staging areas except Staging Areas VIG5 and VIG12~~.
- Preparation of temporary staging areas would include the application of gravel or crushed rock and the installation of temporary perimeter fencing.
- If necessary, the applicant would hire a local security company to provide 24-hour attendance at staging areas during construction.
- The maximum number of workers reporting to staging areas is not expected to exceed 100 at any one time.
- Final siting of staging areas would depend on the availability of appropriately zoned property that is suitable for this purpose.

If, after certification of this document, it is determined that staging areas other than those discussed in this section would be needed, additional environmental analysis pursuant to CEQA may be required. Wire stringing sites for the 500-kV and 115-kV lines are discussed in Section 2.4.5.6.

~~2.4.3.1 Valley–Ivyglen Project Staging Areas~~

~~The applicant stated that the nine staging areas, including the applicant's Menifee Service Center detailed in Table 2-8 would be used for staging activities during construction of the proposed Valley–Ivyglen Project. The location of each staging area is shown on Figures 2-2a through 2-2d and 2-2f.~~

2.4.3.2 Alberhill Project Staging Areas

The applicant stated that the Alberhill Substation site and the ~~following seven~~ staging areas detailed in Table 2-~~10~~9 would be used for staging activities during construction of the proposed Alberhill Project. The location of each staging area is shown on Figures 2-2a, 2-2b, 2-2e, and 2-~~2i~~2h.

~~Table 2-98 Valley–Ivyglen Project Staging Areas~~

~~Staging Sitea~~	~~Size/Land Type~~	~~Location~~
~~Staging Area VIG2b~~	~~5.4 acres/disturbed and already used for staging materials~~	~~South of Valley Substation adjacent to Menifee Road within the City of Menifee.~~
~~Staging Area VIG3~~	~~3.5 acres/disturbed~~	~~Approximately 0.10 miles east of the intersection of SR- 74 and Ethanac Road in unincorporated Riverside County.~~
~~Staging Area VIG4~~	~~2.8 acres/disturbed~~	~~Approximately 0.06 miles east of the intersection of SR- 74 and Ethanac Road in unincorporated Riverside County.~~
~~Staging Area VIG5~~	~~1.6 acres/disturbed~~	~~Southwest of the intersection of Central Avenue and El Toro Cut Off Road in the City of Lake Elsinore.~~
~~Staging Area VIG6~~	~~5 acres/disturbed~~	~~Southwest of the intersection of Collier Avenue and Chaney Street in the City of Lake Elsinore.~~
~~Staging Area VIG8~~	~~3.8 acres/disturbed~~	~~Southwest of the intersection of Collier Avenue and Riverside Drive (SR-74) in the City of Lake Elsinore.~~
~~Staging Area VIG9b~~	~~11 acres/disturbed~~	~~Adjacent to Horse Thief Canyon Road, approximately 0.13 miles southwest of I-15, in unincorporated Riverside County.~~
~~Staging Area VIG10~~	~~12.1 acres/disturbed~~	~~West of Menifee Road and south of Case Road, on north side of Rouse Road in the City of Menifee.~~
~~Staging Area VIG12~~	~~13.0 acres/disturbed~~	~~On the corner of Highway 74 and Rosetta Canyon Drive in the City of Lake Elsinore.~~
~~Staging Area VIG13~~	~~5.0 acres/disturbed~~	~~On the southeast corner of Chaney Street and West Minthron Street in the City of Lake Elsinore.~~
~~Staging Area VIG14~~	~~17.2 acres/disturbed~~	~~0.17 miles south of W Minthorn Street on the northwest side of Chaney Street in the City of Lake Elsinore.~~

~~Note:~~
~~a Staging Areas VIG1 and VIG11 are no longer proposed to be used for the Valley–Ivyglen Project.~~
~~b Staging sites would also be used for the proposed Alberhill Project, see Staging Areas ASP3 and ASP7 in Table 2-9.~~

Table 2-~~10~~9 Alberhill Project Staging Areas

Staging Area[b]	Approximate Size/Land Type	Location
Primary Alberhill Staging Area	~~42.9~~46.0 acres/disturbed	~~Within~~At the ~~footprint of the~~proposed Alberhill Substation site.[c]
Staging Area ASP1	~~19.3~~10.3 acres/disturbed	At the end of Concordia Ranch Road, approximately 0.5 miles east of the proposed Alberhill Substation site in unincorporated Riverside County.
Staging Area ASP2	0.3 acres/disturbed	Between 500-kV Towers SA6 and VA6 within the existing Serrano–Valley 500-kV Transmission Line ROW in the City of Lake Elsinore.
Staging Area ASP3~~[a]~~	7.4 acres/disturbed	Approximately 1 mile west of the proposed Alberhill Substation site, along Horse Thief Canyon Road in unincorporated Riverside County.
Staging Area ASP4	6.1 acres/vacant	West of the intersection of Lewis Street and Mission Trail Road within the City of Lake Elsinore.
Staging Area ASP5	6.2 acres/vacant	Adjacent to the southern side of Skylark Substation within the City of Wildomar.
Staging Area ASP6	3.7 acres/vacant	Approximately 0.25 mile south of Skylark Substation, adjacent to Mission Trail Road within the City of Wildomar.
Staging Area ASP7 ~~[a]~~	10.5 acres/~~4.9~~6.0 disturbed and used as staging and ~~5.6~~4.5 vacant	South of Valley Substation adjacent to Menifee Road within the City of Menifee.
~~Staging Area ASP8~~	~~8.8 acres/disturbed~~	~~.11 miles southwest of Lakeshore Drive and .04 miles west of Diamond Drive in the City of Lake Elsinore~~
Staging Area ASP11 (Concordia)	5.9 acres/disturbed	North of Concordia Ranch Road, approximately 0.2 mile east of the proposed Alberhill Substation site in unincorporated Riverside County.
Staging Area ASP12 (Chaney Yard)	5.0 acres/vacant	Southwest corner of Collier Avenue and Chaney Street in the City of Lake Elsinore.
Staging Area ASP14 (ST-A5)	5.9 acres/vacant	Northeast corner of the intersection of Bundy Canyon Road and Sunset Avenue within the City of Menifee.
Staging Area ASP15 (ST-A4)	4.5 acres/vacant	Northwest corner of the intersection of Bundy Canyon Road and Murrieta Road within the City of Menifee.

Note:

~~[a] Staging sites would also be used for the proposed Valley–Ivyglen Project. See Staging Areas VIG2 and VIG9 in Table 2-8.~~

[b] Staging Areas ASP8, ASP9, ASP10, and ASP13 were considered but no longer proposed to be used for the Proposed Project.

[c] The Alberhill Substation site also includes areas that will be used to install five new LWS poles and four new TSPs associated with 115-kV Segments ASP1 and ASP1.5.

2.4.4 General Construction Plans, Methods, and Materials

2.4.4.1 Water Use during Construction

Various construction activities for the proposed projects would require the use of water, including dust suppression for ground disturbing activities, drilling, and concrete mixing.

~~During construction of the proposed Valley–Ivyglen Project, approximately 56 million gallons of water would be required. Water trucks would be required for up to 10 hours per day for the duration of the proposed Valley–Ivyglen Project. The local water agency would supply all of the water used for construction of the proposed projects.~~

During construction of the proposed Alberhill Substation, approximately 250,000 gallons of water per day would be required for earth moving activities (dust control) and moisture conditioning of soils for compaction purposes. Combined, it is estimated that approximately 37.5 million gallons of water would be required for these activities (250,000 gallons of water per day for 150 days). In addition, approximately 17.5 million gallons of water would be required to control fugitive dust during construction of the 500-kV transmission lines and 115-kV subtransmission lines.

2.4.4.2 Concrete Use

Each 500 kV tower would be typically constructed on four drilled concrete foundations. Steel-reinforced cages and stub angles would be installed into the auger holes and then concrete would be poured. A similar method would be used for 115 kV TSP construction using single drill concrete foundation, but less concrete is required for a TSP foundation.

Concrete foundations in soft or loose soil that extend below the groundwater level may require that the borehole be stabilized with mud slurry during drilling. If this is the case, the applicant would mix and pump a mud slurry into the borehole after drilling to prevent the sidewalls from sloughing. The concrete for the foundation would then be pumped to the bottom of the hole, displacing the mud slurry. The mud slurry that is brought to the surface is typically collected in a pit adjacent to the foundation and then pumped out of the pit to be reused or discarded at an offsite disposal facility.

~~A~~For drilled concrete foundations, a typical 500 kV tower ~~requires~~would require 25 to 100 cubic yards of concrete. Concrete samples would be drawn at the time of pour and tested to ensure engineered strengths were achieved. According to the applicant's specification, the concrete mix used typically takes 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence with erection of the steel tower. The applicant would obtain the concrete from an existing local concrete supply facility.

Where necessary, micropile foundations may be used for tower foundations. Installation of micropiles would require the drilling of several smaller diameter holes (approximately 4 to 10, 4-inch holes) for each foundation. The micropiles would then be tied together to form a single, reinforced concrete cap upon which the tower would be installed.

2.4.4.3 Storm Water Pollution Prevention Plans

The applicant would be required to obtain National Pollutant Discharge Elimination System permits because construction of the proposed projects would disturb surface areas greater than 1 acre. To acquire the permit, the applicant would prepare SWPPPs for each of the proposed projects that include project information, monitoring and reporting procedures, and Best Management Practices (BMPs). The BMPs would cover activities including dewatering procedures, storm water runoff quality control measures, and concrete waste management. The SWPPPs would be based on final engineering design and applicable to all components of the proposed projects.

2.4.4.4 Traffic Control and Lane Closures

Construction activities completed within or along public streets would require the use of a traffic control service and may require lane closures. Lane closures would be temporary and short term, and likely limited to a day at a time during stringing activities. In addition, the applicant may use flaggers to control traffic during conductor and telecommunications wire installation activities in locations where guard structures are not used. These delays would last approximately 15 minutes per conductor for a total of up to one hour in some locations. ~~Very short closures of roads may occasionally be required for equipment and personnel repositioning for safety.~~ Traffic control would be conducted in accordance with local ordinances and permit conditions. Such traffic control measures are typically consistent with those published in the *California* ~~*Joint Utility*~~*Temporary Traffic Control* ~~*Manual* (~~*Handbook* (CATTCH) and the *California* ~~*Inter-Utility Coordinating Committee 2010*~~*Manual on Uniform Traffic Control Devices* (CA MUTCD).

~~*Valley–Ivyglen Project Road Closures*~~

~~Construction of the proposed Valley–Ivyglen Project would result in roadway closures/lane closures at locations where the construction activities would be located within or immediately adjacent to the ROW of public streets and highways:~~

- ~~115-kV Segment VIG2 would be installed adjacent to SR-74~~
- ~~115-kV Segment VIG3 would be installed adjacent to Third Street and Conard Avenue.~~
- ~~115-kV Segment VIG4 would be installed adjacent to Third Street, Pasadena Avenue, SR-74 (Riverside Drive), and Baker Street in the City of Lake Elsinore.~~
- ~~115-kV Segment VIG5 would be installed adjacent to Lake Street between Nichols Road and Temescal Canyon Road in the City of Lake Elsinore and unincorporated western Riverside County. Segment 5 would then continue along Temescal Canyon Road until reaching Hostettler Road.~~
- ~~115-kV Segment VIG7 would be installed adjacent to De Palma Road.~~
- ~~Construction of approximately 0.4 miles of 115-kV Segment VIG7 would occur along Temescal Canyon Road.~~
- ~~115-kV Segment VIG8 would be installed adjacent to the northbound lane of Temescal Canyon Road.~~

~~Temporary closures along these alignments may be necessary to facilitate construction activities occurring into or close to the public roadway. Installation of these segments would require temporary lane closures between two and four days during pole installation and/or installation and removal of guard structures. These lane closures would be limited to the areas of active construction.~~

~~The modified stringing setup areas located adjacent to or within roadways would also require lane closures. Lane closures would be temporary and short term, and likely limited to a day at a time during stringing activities. In addition, the applicant may use flaggers to control traffic during conductor and telecommunications wire installation activities in locations where guard structures are not used. These~~

~~delays would last approximately 15 minutes per conductor for a total of up to one hour in some locations. Additionally, stringing activities would require temporary traffic stops along local roads as well as I-215, I-15, and SR-74.~~

~~Approximately 1.9 miles of new underground conduit would be installed as part of the Proposed Modifications to accommodate the telecommunications and 115-kV lines. Similar to the underground portions of the subtransmission line, the installation of these facilities would require temporary lane closures. These closures would last approximately two months, would be dispersed across the entire underground telecommunications system alignment, and would require agency coordination through the encroachment permit process.~~

Alberhill Road Closures

Construction of the ~~proposed Alberhill~~Proposed Project would result in roadway closures/lane closures at several locations where the construction activities would be located within or immediately adjacent to the ROW of public streets and highways:

- 115-kV Segments ASP1 and ASP1.5 would be constructed adjacent to Temescal Canyon Road. ASP1.5 would cross I-15.
- 115-kV Segment ASP2 would be constructed adjacent to Concordia Ranch Road, Temescal Canyon Road, Lake Street, Nichols Road, Baker Street, SR-74 (Riverside Drive), Pasadena Street, and Third Street. Construction would include crossing I-15 south of Concordia Ranch Road.
- 115-kV Segment ASP3 would be constructed adjacent to or within Collier Avenue, Second Street, and Camino del Norte. Construction would include crossing I-15 in the City of Lake Elsinore.
- 115-kV Segment ASP4 would be constructed adjacent to East Hill Street, Pottery Street, Avenue 6, Auto Center Drive, Casino Drive, Malaga Road, and Mission Trail.
- 115-kV Segment ASP5 would be constructed adjacent to Waite Street, Almond Street, Lemon Street, Lost Road, Beverly Street, and Bundy Canyon Road. Construction would include crossing I-15 along Lemon Street.
- 115-kV Segment ASP6 would be constructed adjacent to Murrieta Road.
- 115-kV Segment ASP7 would be constructed adjacent to Murrieta Road.
- 115-kV Segment ASP8 would be constructed adjacent to MacLaughlin Road.

Temporary closures along these alignments may be necessary to facilitate construction activities occurring into or close to the public roadway. Installation of these segments would require temporary lane closures between two and four days during pole or duct bank installation and/or installation and removal of guard structures. These lane closures would be limited to the areas of active construction.

Lane closures would be temporary and short term, likely limited to a day at a time during stringing activities. In addition, the applicant may use flaggers to control traffic during conductor and telecommunications wire installation activities in locations where guard structures are not used. These delays would last approximately 15 minutes per conductor for a total of up to one hour in some locations.

Additionally, stringing activities would require temporary traffic stops along local roads as well as I-15 and SR-74.

Approximately ~~1.1 miles~~0.8 mile of new underground ~~conduit~~duct bank would be installed as part of the ~~proposed project~~Proposed Project to accommodate the telecommunications and 115 kV subtransmission lines. Similar to the underground portions of the subtransmission line, the installation of these telecommunications facilities would require temporary lane closures. These closures would last approximately two months, would be dispersed across the entire underground telecommunications system alignment, and would require agency coordination through the encroachment permit process.

Relocation of the EVMWD pipeline would require closure on one road. The reroute of the pipeline would cross Concordia Ranch Road near its intersection with Temescal Canyon Road. One lane of Concordia Ranch Road would be kept open at all times during the day, with both lanes being open at night. One lane of traffic would be closed while work in that area is completed. Once work in that area is completed, then that lane would be open and the opposite lane would be closed while work is completed on the other side of the road. The rerouted pipeline would run parallel to Temescal Canyon Road. Love Lane would be relocated to the west in the area where the relocated pipeline is planned to cross the current Love Lane alignment. Love Lane would therefore remain open for the entirety of construction.

2.4.4.5 Nighttime Construction

Under normal circumstances, construction of the proposed projects would occur during daylight hours. However, there is a possibility that construction would occur at night and temporary lighting would be required. The California Independent System Operator or California Department of Transportation, for example, may require that conductor stringing over highways occur at night. In the event of nighttime construction, the applicant would use lighting to protect the safety of the construction workers but would orient the lights to minimize effects on sensitive receptors.

2.4.4.6 Identification of Underground Utilities

By California law, prior to conducting any excavation, including drilling boreholes for foundations or LWS poles, the applicant or its contractor would be required to contact Underground Service Alert to identify underground utilities in the construction area. If other utilities are located in the construction area, the applicant would contact the owner of the utility to discuss protection and avoidance measures. Exploratory excavations (potholing) may be required to verify the location of existing utilities.

2.4.4.7 Hazardous Materials Use and Hazardous Waste Disposal

The SWPPPs prepared for the proposed projects would provide information about the locations where hazardous materials would be stored during construction and the protective measure, notification, and cleanup requirements for accidental spills or releases of hazardous materials. They would also contain cleanup requirements for accidental spills or releases of hazardous materials. The applicant would make Safety Data Sheets for all hazardous materials in use at the construction site available to all site workers in case of emergency.

~~Construction and operation of the proposed Valley–Ivyglen Project would require limited use of hazardous materials (e.g., fuels, lubricants, and cleaning solvents). The applicant would store, handle, and use hazardous materials in accordance with applicable regulations. The applicant would dispose of hazardous waste at an appropriately licensed facility.~~

~~Similarly, construction~~Construction and operation of the ~~proposed Alberhill~~Proposed Project would require ~~the same types and amounts~~limited use of hazardous materials ~~as the proposed Valley–Ivyglen~~

~~Project, with the exception of~~(e.g., fuels, lubricants, and cleaning solvents). It would also require fuel for the proposed emergency backup generator, mineral oil (transformer oil) for insulating media in the 500/115-kV transformers, and battery fluid contained in batteries located in the control room at the Alberhill Substation site (Table 2-2). The applicant would store, handle, and use hazardous materials in accordance with applicable regulations and would dispose of hazardous waste at an appropriately licensed facility.

~~The~~With the exception of the fuel for the backup generator at the Alberhill Substation, the applicant would not store any other bulk fuels onsite during construction or operation of the ~~proposed projects~~Proposed Project. Existing fuel supply facilities would be used by the applicant and its contractors. An offsite fuel supply truck may temporarily be brought onsite to support construction vehicles. Small quantities of fuel—10 to 40 gallons—would be stored onsite for gasoline powered hand tools and small portable generators.

Wood poles that are removed may be reused by the applicant, ~~returned to the manufacturer,~~ disposed of in a Class I hazardous waste landfill, or disposed of in the lined portion of a municipal landfill certified by the associated Regional Water Quality Control Board depending on their condition and original chemical treatment. Thirty cubic yards (estimated at 6 tons) of treated wood utility poles was recovered by the applicant during horse ranch demolition activities conducted in 2011 for the ~~proposed Alberhill~~Proposed Project (Section 2.4.6.1).

2.4.4.8 Waste Disposal and Recycling

~~*Valley–Ivyglen Project*~~

~~Construction would result in the generation of approximately 40 tons of various waste materials that would be recycled and salvaged as described for the proposed Alberhill Project. Construction of the proposed Valley-Ivyglen Project would generate approximately 31,873 tons of waste material that cannot be reused or recycled (e.g., wood, soil, vegetation, and sanitary waste). Waste would be generated from the removal of existing structures, shoofly (temporary 115-kV line) construction, and civil work for the proposed 115-kV structures including new access roads. The applicant would use approved disposal facilities for the disposal of construction waste that cannot be salvaged or recycled.~~

Alberhill Project

Construction of the ~~proposed Alberhill~~Proposed Project would result in the generation of approximately 40 tons of various waste materials that can be recycled and salvaged. Items that may be recycled include steel (e.g., electrical towers, support beams, nuts, bolts, and washers), conductor wire, and other hardware (e.g., shackles, clevises, yoke plates, links, or other connectors used to support conductor wire). These items would be gathered by construction crews and separated into roll-off boxes. Salvageable items (i.e., conductor, steel, and hardware) would be transported to staging areas, sorted, and baled for sale through available markets.

Construction of the ~~proposed Alberhill~~Proposed Project would also generate approximately 142,070 tons of waste material that cannot be reused or recycled (e.g., wood, soil, vegetation, and sanitary waste). Waste would be generated from relocation of the water line on the proposed Alberhill Substation site, removal of existing 500 kV and 115 kV structures, and civil work for the proposed 500 kV structures including the proposed access roads. Soil excavated for building and equipment foundations at the proposed Alberhill Substation site would be stockpiled during excavation and ultimately would be graded and compacted onsite. The applicant would use applicant-approved disposal facilities for the disposal of construction waste that cannot be salvaged or recycled.

In addition, materials that were removed from the horse ranch site in 2011 (Section 2.4.6.1) included wood, metal, rock, concrete, soil, green waste, and fiberglass. Waste (176 tons) was disposed of at El Sobrante Landfill in Corona, California, and four dump-truck loads of concrete and rock (45 tons) was processed at Wyroc Regional Materials Recovery, Inc. in Vista, California.

2.4.4.9 Cleanup, Restoration, and Roadway Repair

The applicant would restore all areas temporarily disturbed during construction of the ~~proposed projects~~Proposed Project, including temporary staging areas and wire-stringing sites, to as close to ~~preconstruction~~pre-construction conditions as possible or to the conditions agreed upon ~~between the applicant and~~with each landowner after completion of construction. The applicant would repair damage to roads that results from construction in accordance with local requirements after construction is complete. The applicant would conduct a final inspection to ensure that cleanup activities were successfully completed.

2.4.5 Subtransmission and Transmission Line Construction

The applicant would be required to ensure that the proposed transmission, subtransmission, and telecommunication lines would maintain, at minimum, the clearance requirements specified in California Public Utilities Commission (CPUC) General Order (GO) 95, *Rules for Overhead Electric Line Construction*. The clearance requirements apply to distances to the ground and between conductors at highways, bridges, buildings, water areas, and other crossings.

2.4.5.1 Access Road Construction

The applicant would first clear and grub access roadways (new and existing) of vegetation. Then the roadways would be graded to remove potholes, ruts, and other surface irregularities and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. To minimize impacts from road construction on drainage and wetland areas, the applicant would access construction sites using overland access where possible. Road preparation work would not be required for overland access areas that may be used through relatively flat, grassy areas that do not include aquatic features (e.g., drainages or wetlands). Overland access areas would not be maintained after construction of the proposed projects.

~~***Valley–Ivyglen Project***~~

~~The drivable area of the proposed access roads would generally be 24 feet wide with an additional 2 feet on each side if drainage berms or swales are required. In addition, hilly terrain along sections of 115-kV Segments VIG1 and VIG6 may require additional permanent and temporary disturbance areas for vehicle turnaround and positioning during access road construction. In some locations, the permanent, graded disturbance areas may be as wide as 100 feet, and the temporary disturbance areas may be as wide as 200 feet. The access roads constructed to accommodate construction would be permanent.~~

~~Slope stability improvements may also be required during the new access road construction, widening of existing access roads, repairing earthen slopes damaged by erosion, grading with significant cut and fill depths, and benched grading activities. It is typically preferable to use cut-and-fill slopes that are configured at slope ratios that are stable without using reinforcement. However, due to ROW limitations, sensitive resource avoidance, and existing topography, the proposed Valley–Ivyglen Project may require reinforced earthen slopes, permanent erosion control, or an earth retaining system. The applicant estimates that the total combined length of retaining walls may be approximately 2,200 feet with an average height of 8 feet. Other slope stability systems considered include mechanically stabilized systems, along with drainage improvements (i.e., v-ditches, downdrains, energy dissipaters, etc.). The~~

~~extent of slope stability improvements and earth retaining walls are determined during final engineering after site-specific geotechnical investigations and a topographic survey are performed.~~

~~Substantial cut-and-fill grading activities to repair slopes damaged by erosion may be required along 115-kV Segments VIG1 and VIG6 to construct access roads. Benched (terraced) grading activities may be required. Benching is a technique in which a tracked earth-moving vehicle excavates terraced sites in steep and rugged terrain. Blasting or fracturing may also be required. Blasting and fracturing are described in Section 2.4.5.4. Permanent erosion control facilities (e.g., retaining walls) may also be required based on the topography and resources present. Other slope stability systems may include drainage improvements (e.g., v-ditches, downdrains, or energy dissipaters). The extent of slope stability improvements required would be determined during final engineering and based on the results of site-specific geotechnical investigations.~~

~~Blasting or fracturing may also be required. Blasting and fracturing are described in Section 2.4.5.4.~~

Alberhill Project

~~Under the conventional method of construction for~~For the 500 kV transmission line, ~~about~~approximately 3.4 ~~6.1~~ miles of access road would be constructed (includes new and modified). ~~Under the helicopter construction method, no access road would be constructed for the 500-kV transmission line.~~ ~~About 325 feet of access road would be constructed for 115-kV Segment ASP5.~~ The drivable area of the proposed access roads would generally be 24 feet wide with an additional 2 feet on each side if drainage berms or swales are required.[~~11~~12] In addition, hilly terrain along the proposed 500 kV transmission line routes is anticipated to require additional permanent and temporary disturbance areas for vehicle turnaround and positioning during access road construction. In some locations, the permanent, graded disturbance areas may be as wide as ~~200~~220 feet, and the temporary disturbance areas may be as wide as ~~500~~350 feet. Temporary disturbance would result from grading and vegetation removal outside the permanent roadway. This could include reinforced earthen slopes, permanent erosion control, or an earth retaining system to support the permanently disturbed drivable portion of the road. The temporarily disturbed areas would also be where BMPs are installed. These temporarily disturbed areas would be revegetated after construction is complete. The access roads constructed to accommodate construction would be permanent. Modifications in the permanent disturbance area would include the drivable portion of the road as well as appurtenant infrastructure, such as drainage improvements.

The ~~proposed Alberhill~~Proposed Project would repair and stabilize slides, washouts, and other slope failures along the roads due to inclement weather by installing retaining walls or other means necessary to prevent future failures. The type of drainage structure or earth-retaining structure to be used would be based on site-specific conditions. The crossing of an aquatic feature (Figure 4.9-2) to access 500-kV Tower SA5, is discussed in Section 4.9.

2.4.5.2 Helicopter and Airstrip Use

~~*Valley–Ivyglen Project*~~

~~Light-duty helicopters may be used along 115-kV Segments VIG1 and VIG4 to VIG6VIG7 for materials delivery, hardware installation, and wire stringing. In general, helicopter operations (including takeoff and landing) would be limited to areas in proximity to wire stringing sites or access roads and previously disturbed areas near construction sites within the 115-kV Valley–Ivyglen General Disturbance Area~~

[~~11~~12] Berms are low earthen walls constructed to help retain and direct surface water runoff. Swales are depressions that collect surface water runoff.

~~(Section 2.4.2.1) or the fueling, takeoff, and landing areas described below. Heavy-duty helicopters would not be used for construction of the proposed Valley–Ivyglen Project.~~

Alberhill Project

The applicant ~~may~~would use ~~a~~ medium- and heavy-duty ~~helicopter~~helicopters to facilitate construction in lieu of constructing new access roads ~~or where~~for three of the proposed 500 kV transmission line towers ~~would be located on terrain on which a crane could not be used or some of the required equipment and materials could not be delivered by truck (refer to Section 2.4.5.5)~~. For all sections of the 500 kV transmission lines, a light-duty helicopter would be used for *sock-line threading*—the stringing of a lightweight pilot line (a sock line) between power line structures. After securing the sock line to the conductor-pulling cable, the sock line and the conductor-pulling cable are threaded through the structures.

The applicant does not anticipate that helicopters would be used for 115 kV subtransmission line construction with the exception of wire stringing along a section of 115-kV Segment ASP5 between Lost Road and Bundy Canyon Road that is undeveloped and has hilly terrain (Figure 2-~~2g~~2h and 2-2i). For wire stringing along these 115 kV segments, a light-duty helicopter would be used. For all other 115 kV segments, the applicant would install conductor on the proposed 115 kV subtransmission lines using a line truck instead of a helicopter to string the sock line.

Helicopter Fueling, Takeoff, and Landing Areas

Helicopter fueling, takeoff, and landing may occur at Skylark Field Airport, Perris Valley Airport, French Valley Airport, or the applicant's Chino Air Operations Facility at Chino Airport for ~~either of~~ the ~~proposed projects~~Proposed Project. In addition:

- ~~For the Proposed Valley–Ivyglen Project, helicopter fueling, takeoff, and landing may also occur within the Valley–Ivyglen 115-kV General Disturbance Area (Section 2.4.2.1) along 115-kV Segments VIG1 and VIG4 to VIG7 and at all Valley–Ivyglen Project staging areas except Staging Areas VIG5 and VIG VIG12.~~

- ~~For the proposed Alberhill Project, helicopter~~Helicopter fueling may also occur at the proposed Alberhill Substation site or at Staging Areas ASP1 ~~or~~, ASP3, or ASP11.

- ~~For the proposed Alberhill Project, helicopter~~Helicopter takeoff and landing may also occur adjacent to wire stringing sites along the 500 kV transmission line routes during wire-stringing activities or for materials delivery, adjacent to tower sites for micropile foundation construction activities and tower erection, and at Staging Areas ASP1, ASP2, ASP3, and ~~ASP3~~ASP11.

Temporary landing areas within staging areas, at wire-stringing sites, or along the 500 kV transmission line routes would be approximately 100 feet wide by 100 feet long. The helicopter contractors selected by the applicant for construction of the ~~proposed projects~~Proposed Project may select helicopter operations facilities or airports other than those listed in this document, which could result in the need for additional evaluation pursuant to CEQA. Helicopters would remain at local airports, or the applicant's or helicopter contractor's air operations facilities at night or when not in use.

Skylark Field Airport

Construction activities for the ~~proposed Alberhill~~Proposed Project 115 kV segments would occur within 1,000 feet of a private airstrip (Skylark Field Airport) in southern Lake Elsinore. The airport is private and primarily used for skydiving. It has turf runways, the longest of which is approximately 2,800 feet (AirNav, LLC 2013a). The applicant would provide written notice of the construction schedule to the

Skylark Field Airport operator prior to construction of components of the proposed Alberhill Project that would require use of the airport or construction activities that would occur near the airport (e.g., construction on Mission Trail, Waite Street, Lemon Street, Lost Road, and Beverly Street). The applicant may stage helicopters and helicopter support equipment at local airports, including Skylark Field Airport, for the ~~proposed Alberhill~~Proposed Project.

Perris Valley Airport

The applicant may stage helicopters and helicopter support equipment at local airports, including Perris Valley Airport, for the ~~proposed Valley–Ivyglen~~Proposed Project. Perris Valley Airport is a public-use airport with an asphalt runway that is approximately 5,100-feet long (AirNav, LLC 2013b). The airport is located approximately 1.5 miles north of ~~115-kV Segment VIG1 and~~ 115-kV Segment ASP8.

French Valley Airport

The applicant may stage helicopters and helicopter support equipment at French Valley Airport, a public use airport with an asphalt runway that is approximately 6,000 feet long (AirNav, LLC 2023). The airport is located approximately 6.4 miles southeast of 115-kV Segments ASP5 and ASP6.

Chino Airport

The applicant's Chino Air Operations Facility is located at 7000 Merrill Avenue in Chino, California, at the Chino Airport (approximately 18 miles northwest of Ivyglen Substation). Chino Airport is a public use airport located within Los Angeles County with asphalt runways, the longest of which is approximately 7,000 feet (AirNav, LLC 2013c). The Chino Air Operations Facility may be used for helicopter staging activities.

Helicopter Specifications and Best Management Practices

Helicopters would be used in accordance with the applicant's specifications, which are similar to the methods detailed in the Institute of Electrical and Electronic Engineers 951-1996 Standard, Guide to the Assembly and Erection of Metal Transmission Structures (Section 9, Helicopter Methods of Construction). The applicant may need to submit a Congested Area Plan to the Federal Aviation Administration 30 to 60 days prior to start of construction for helicopter external-load operations over populated areas or areas congested with structures or objects. Determination of whether a Congested Air Plan is necessary will be made through consultation with the Federal Aviation Administration.

The type of helicopter used for transmission and subtransmission line construction would be determined during final engineering design for the ~~proposed projects~~Proposed Project and would depend on the helicopters and contract helicopter services available at the time of construction. For the purpose of the analyses in this document, the applicant indicated that a light-duty Hughes 500E (369E) helicopter with a Rolls Royce 250-C20B engine (refer to Appendices B1 and B2 for estimated hours of operation) or similar would be used for wire stinging activities and materials delivery.

Heavy-duty helicopters or medium-duty helicopters would ~~not~~ be required for ~~the proposed Valley–Ivyglen Project but may be used as part of the proposed Alberhill Project. If a heavy-duty or medium-duty helicopter is required for~~ construction of the proposed 500 kV transmission lines ~~as part of the Alberhill Project because of~~ due to the rough terrain~~, the~~. The following, or similar, models would be used for ~~up to five days (up to 12 hours per day or in accordance with all applicable noise ordinances)~~between 8 and 12 hours per day:

- Sikorsky ~~S64~~S64F Skycrane twin-engine heavy-lift helicopter with Pratt and Whitney T73-P-1 engines (heavy-duty); or

- Kaman K-MAX helicopter with a Lycoming T53 engine (medium-duty helicopter); or
- Hughes 500-530 helicopter.

The Sikorsky S64F would be used for up to 7 days and the other helicopter models would be used for up to 127 days. ~~If the Helicopter Construction option is used, the models listed above would be used for up to 22 weeks (up to six days per week, 12 hours per day, or in accordance with all applicable noise ordinances). Actual flight time for each helicopter would not exceed 5 hours per day.~~

Consistent with Project Commitment H, the ~~The~~ applicant would employ BMPs to minimize noise impacts caused by the use of helicopters. BMPs would include:

- Maximizing the efficient use of ~~Using helicopters with low emitting engines to the extent practical~~
- ~~Efficiently maximizing~~ flight times
- Designating flight paths away from residential areas
- Identifying sensitive receptors that might be disturbed by construction noise
- Providing advance notice of helicopter work
- ~~Obtaining variances from local noise ordinances as required~~

The applicant would not use helicopters for construction at night. Helicopters would only be used during daylight hours consistent with applicable laws and regulations.

2.4.5.3 Removal of Existing Structures

115-kV and Distribution Structure Removal

After the existing 115 kV subtransmission, distribution, and telecommunication lines are transferred to the proposed structures, the existing 115 kV structures would be completely removed, including their below-ground components. The remaining holes would be backfilled using native and/or clean fill remaining from excavation activities in combination with imported clean fill as needed. Conductor and hardware on the structures would also be removed and recycled or disposed of as described in Section 2.4.4.8.

Existing access roads would be used where feasible to reach the structures to be removed. Road work may be required and could include any of the activities described under Section 2.4.5.1 for access road construction. Wire-pulling sites for conductor removal would typically be located at intervals of approximately 6,500 feet but would be adjusted to accommodate site-specific conditions. In some cases, the tops of existing poles would be removed after removal of the subtransmission line. The distribution line would be left in place on the lower section of the poles until the distribution line is relocated. The topping of poles would be completed with a bucket truck and saw. The numbers of subtransmission ~~and distribution~~ structures to be removed are presented in Table~~s 2-1 and~~ 2-2.

~~For the proposed Valley–Ivyglen Project, approximately 35 distribution-line riser poles would be replaced with 115-kV structures designed to support the required distribution-line riser pole components on their lower sections. Each replacement would require approximately 30 feet of trenching (20 to 24 inches wide and 42 inches deep) to facilitate the replacement. In addition, approximately three distribution-line riser poles would require installation of approximately 3 to 4 additional vaults and approximately 600 to 2,500 feet of trenching each. Trenching would be completed on Temescal Canyon Road near Indian Truck trail and on Temescal Canyon Road between Hostettler Road and I-15. Distribution-line riser poles are located at each terminus of an underground segment of distribution line where conductor transitions up the riser~~

~~pole to an overhead position. Trenching and vault installation would be conducted as described in Section 2.4.5.4, under the heading, "Trenching and Duct Banks" and "Vault Installation."~~

~~Where new 115-kV structures would replace distribution line structures, the new 115-kV structures would be installed along the same alignment of the existing distribution structures, but the span lengths between structures would differ. Spans lengths between 115-kV structures are, on average, greater than span lengths between distribution structures.~~

For the proposed Alberhill Project, where new 115 kV structures would replace existing 115 kV structures, the new structures would be installed as close as possible to the original structures, where existing structures are present.[~~12~~13]

500-kV Tower Removal

To remove Serrano–Valley 500 kV Transmission Line tower M13-T4, the applicant would do the following:

1. The transmission line would be de-energized.
2. Grounding and wire snubbing would be completed as described in Section 2.4.5.3.
3. Conductor spans would be removed from the existing tower and transferred to the proposed 500 kV towers.
4. The tower would be dismantled down to the tower footings.
5. The footings would be removed to 2 feet below grade.
6. The footing holes would be backfilled using clean fill material excavated in proximity to the tower site during construction. If excavated material is not suitable for backfill, clean fill material, such as clean dirt and/or base material, would be imported.

The applicant anticipates that removal of the 500 kV tower would occur within the same period as installation of the proposed 500 kV towers and conductor to minimize the amount of time that the Serrano–Valley 500 kV Transmission Line would be out of service.

2.4.5.4 115-kV Structure Construction

The following construction activities are proposed for the 115 kV segments. The number of structures to be removed and installed and length of each segment are provided in Table~~s 2-1 and~~ 2-2.

Grading and Laydown Areas

The new guy pole, wood~~ pole, hybrid~~ pole, LWS pole, H-frame structure, and TSP locations would first be graded and/or cleared to provide an adequately level and vegetation-free surface for footing construction as identified in Table 2-6.~~ An approximately 50-foot by 50-foot area around each guy pole, 100-foot by 100-foot area around each wood pole, 150-foot by 75-foot area around each hybrid pole, 150-foot by 75-foot area around each LWS pole and H-frame structure, and 200-foot by 150-foot area around each TSP would be cleared of vegetation to provide a safe working area and laydown area needed for pole assembly (Tables 2-5 and 2-7).~~

Depending on the location, the assembly and erection of some TSPs may require that a new crane pad, approximately 50 feet by 50 feet, be prepared to allow an erection crane to set up approximately 60 feet

[~~12~~13] Exceptions (i.e., where existing pole locations would not be reused) may include, but would not be limited to, requirements for even span lengths, avoiding utility infrastructure, spanning driveways, and pole loading—the mount of force that may be applied to an installed pole.

from the centerline of the TSP. Crane pads would be located transversely (crosswise) from the TSP. The locations that would require a crane pad cannot be determined until final engineering and, therefore, for the purposes of this document, it is assumed that crane pads could be required anywhere along 115 kV segments that would include the installation of a TSP (Table~~s 2-1 and~~ 2-2).

~~Blasting and Fracturing (Valley–Ivyglen Project)~~[1314]

~~Blasting or fracturing would only occur in areas that require excavation and where subsurface obstructions reasonably preclude excavation using conventional construction equipment as part of the proposed Valley–Ivyglen Project. Blasting or fracturing may be required during access road construction, site preparation, excavation work, or foundation work.~~

~~Blasting or fracturing may be required where rock is present to install the proposed structures along 115-kV Segments VIG1, VIG2, VIG5, VIG6, and VIG8. Structure and access road sites that may require blasting are shown in Table 2-11. If, after certification of this document, it is determined that blasting locations other than those discussed in this section would be needed, additional environmental analysis pursuant to CEQA may be required.~~

~~Table 2-1110 Blasting Details and Locations (Valley–Ivyglen Project)~~

~~Segment~~	~~Material Removed (Estimated)~~	~~Nearest Sensitive Receptor~~	~~Blasting Location by Proposed 115-kV Structure Site~~ [(a)]
~~115-kV Segment VIG1~~	~~2,240 cubic yards~~	~~80 feet~~	~~Access road between Structures 144 and 147~~[(b)]
~~115-kV Segment VIG1~~	~~400 cubic yards~~	~~80 feet~~	~~Structures 131 and 144–157 (15 structures)~~
~~115-kV Segment VIG2~~	~~267 cubic yards~~	~~65 feet~~	~~Structures 212–214, 219, 221, 224, 230, and 251–253 (10 structures)~~
~~115-kV Segment VIG5~~	~~107 cubic yards~~	~~90 feet~~	~~Structures 32 to35 (4 structures)~~
~~115-kV Segment VIG6~~	~~107 cubic yards~~	~~None in proximity~~	~~Structures 527–530 (4 structures)~~
~~115-kV Segment VIG8~~	~~Not provided~~	~~None in proximity~~	~~Each underground vault location (8 vaults)~~

~~Sources: SCE 2013, 2014 Notes:~~

~~(a) Proposed Valley–Ivyglen 115-kV structure sites are shown on Figures 2-2a through 2-2d, 2-2f, and 2-2i.~~

~~(b) Boulders in this location may be associated with a known cultural site (P-33-000714/CA-RIV-714). The State Historic Preservation Officer has concurred that the proposed project impact area would not overlap with contributing elements of the site. In this area, the applicant has agreed to spot check all boulders to be blasted prior to their removal (Roland-Nawi 2014). Refer to Section 4.5, "Cultural Resources."~~

~~Explosive agents that may be used include dynamite, ammonium nitrate/fuel oil, slurry (water-gel explosive), and packaged emulsion explosives. Open blasting areas, such as areas to be leveled for road construction, typically require up to 1.5 pounds of explosive agent per cubic yard of rock. Close-quarters sites (e.g., sites to be excavated for the installation of concrete footings for utility structures) can require up to 4 pounds of explosive agent per cubic yard of rock. The maximum blast depth would be no more than 5 feet per blast. Blasting may be required for up to the full depth of the required excavation depending on the amount of rock present and results of the geotechnical analyses.~~

~~Prior to blasting, distances to sensitive receptors in the area would be assessed to ensure that the blast would be engineered to be safe and effective. The area would be secured to avoid inadvertent entry by the public or other personnel. Holes would be drilled and the explosive charges loaded into the holes. Protective measures (e.g., gravel or blast mats) would be installed to control rock and debris that may be~~

[1314] ~~Blasting and fracturing are not anticipated to be needed as part of the Alberhill Project.~~

~~expelled from the blast site. The appropriate pre-blast warning signals would be given prior to detonating the blast. After detonation, a post-blast safety inspection would be conducted to ensure that the blast completely discharged and that personnel may safely return to excavate blasted material.~~

~~Fracturing involves boring into rock at various points in a pattern configuration and filling pre-drilled holes with an expansive agent. Expansive agents are fine-grain powders that, when mixed with water, form a slurry that can be poured. At the appropriate temperature, the slurry expands substantially in size. The expansive agent hardens as it dries and expands. Expansive agents that may be used for fracturing include limestone, dolomite, calcium hydroxide, calcium oxide, silicon dioxide, aluminum oxide, and ferric oxide. Fracturing is a much slower process than blasting. It requires up to one work day for preparation and 24 hours for the expansion agent to cure and expand. Geotechnical survey results and contractor input are considered when determining the safest and most effective method to break up material. Fracturing is not a viable alternative to blasting in all situations. All blasting and fracturing would be conducted in accordance with applicable laws and regulatory requirements.~~

Guy Pole, Wood Pole, H-Frame, and Lightweight Steel Pole Installation

The proposed guy poles, wood poles, H-frames, and LWS poles would be installed in holes bored into soil that are approximately 1.5 feet to 3 feet in diameter and 6 feet to 14 feet deep. They would be direct buried—installed into the ground without a foundation or footings. While on the ground at the laydown area, the poles would be configured, if not preconfigured, with the necessary crossarms, insulators, and wire-stringing hardware. LWS poles are typically shipped to the laydown area in sections with slip joints and then jacked together. The poles would be installed using a line truck. Once the poles are set in place, excavated material from the holes would be used to backfill the hole. If the excavated material is not suitable for backfill, clean fill material, such as clean dirt and/or base material, would be imported. The applicant would use excess excavated material to backfill the holes or dispose of it offsite in accordance with all applicable laws.

H-frame structures, which are composed of two LWS poles spaced approximately 12 feet apart, would be used for applications that require extra structure strength. The installation process for H-frames would be similar to that for a single LWS pole.

Tubular Steel Pole Installation

TSPs would be used in areas where the length and strength of LWS poles would be inadequate (e.g., freeway crossings and turning points). The tallest TSPs for the ~~proposed Alberhill~~Proposed Project would be used at I-15 crossings. ~~For the proposed Valley–Ivyglen Project, the tallest TSPs would be used at I-15 crossings and to span a cultural resources site located along 115-kV Segment VIG1~~. The TSPs would be attached to a concrete foundation approximately 5 feet to 8 feet in diameter that extends 20 to 50 feet below ground and ~~up to~~approximately 2 feet above ground. A crane would be used to position each pole base section onto the foundation. When the base section is secured, the top section would be placed above the base section. The sections would be slipped together and may be spot welded together for additional stability.

~~*Hybrid Pole Installation (Valley–Ivyglen Project)*~~

~~Hybrid poles consist of a separate base and top sections. The base section would be made of concrete and the top section made of steel. Each hybrid pole would consist of a prefabricated concrete base section that would be installed into an approximately 6-foot-diameter hole that is 20 to 25 feet deep. The proposed hybrid poles along 115-kV Segment VIG4 would be direct buried without poured-in-place foundations. No hybrid poles are anticipated for the proposed Alberhill Project. The hole would be excavated using either an auger or a backhoe. The prefabricated concrete base would be set inside the hole, and the hole~~

~~would be backfilled with engineered backfill material. Final engineering design would determine appropriate backfill material to fill the annular space around the foundation. Typically, a granular backfill or slurry backfill material is used. In the event natural water levels exist at a level above the excavation depth, polymer or bentonite stabilizing agents (absorbent clay material) may be required to prevent caving during the drilling process or setting of the base section. Fluids displaced by the backfill material and pole setting process would be vacuumed into tanker trucks and disposed of at an off-site facility.~~

~~When the base section is secured, the steel upper pole sections would be installed by slipping them onto the concrete base. Typically, a crane and a line truck are used for the installation of hybrid poles. Once the pole sections are assembled, the sections would be jacked together.~~

~~*Shoofly Construction (Valley–Ivyglen Project)*~~[~~14~~15]

~~A shoofly line is a temporary electrical line used during construction activities to maintain electrical service to an area while allowing sections of a permanent line that requires modification to be taken out of service. The applicant proposes to install a temporary shoofly line along Temescal Canyon Road along the westernmost 0.5 miles of 115-kV Segment VIG7 to the start of 115-kV Segment VIG8 (Figure 2-2a). The proposed shoofly line would consist of approximately 10 wood poles. 115-kV subtransmission line conductor would be installed on the poles as described in Section 2.4.5.6.~~

~~The temporary shoofly line would be energized after its construction, which would allow a section of the Fogarty–Ivyglen 115-kV line to be de-energized with the minimal loss of 115-kV electrical service to Ivyglen Substation. The Fogarty–Ivyglen 115-kV line provides the single source of 115-kV electrical service to Ivyglen Substation. Electrical outages would be required to facilitate work at the intercept points of the existing line and shoofly line. To construct the proposed shoofly line along 115-kV Segment VIG7, the applicant estimates that four to eight interruptions in electrical service to Ivyglen Substation would occur. Once the proposed 115-kV Valley–Ivyglen line is operational, all conductor cables and wood poles for the shoofly line would be removed after 115-kV Segment VIG7 is operational, as described in Section 2.4.5.3.~~

115-kV Underground Installations ~~(Valley-Ivyglen Project)~~[~~15~~16]

115-kV Segments ~~VIG1~~ASP2 and ~~VIG8~~ASP8 would be ~~at least~~ partially located in new ~~or~~and existing underground conduits.

Trenching and Duct Banks

A duct bank contains conduit, spacers, ground wire, and concrete encasement. Duct banks for 115 kV subtransmission lines typically contain six polyvinyl chloride conduits (each approximately 6 inches wide) that are fully encased with a minimum of 3 inches of concrete. They can accommodate up to six cables and may include additional conduits for distribution or telecommunications lines. The ~~proposed~~ underground duct banks ~~for~~ installed during the Valley–Ivyglen ~~115-kV line would use~~ Project used three of the six conduits ~~and leave~~, leaving three spare conduits for ~~future~~ use ~~pursuant to~~by the ~~applicant's standards for 115-kV underground construction. Each kV~~Proposed Project along 115-kV Segment ASP2. In addition, approximately 550 feet of new duct bank ~~kV~~ would be installed along 115-kV Segments ASP2 and in ASP8. These duct banks would be approximately ~~21~~34 inches high by ~~20~~19 inches wide.

~~14~~15 ~~No shoofly construction is anticipated to be needed for construction of the proposed Alberhill Project.~~

~~15~~16 ~~No subtransmission line segments~~ Portions of 115 -kV Segments ASP2 and ASP8 would be placed underground as part of the Proposed Alberhill Project.

~~Approximately~~An approximately 20-inch to 24-inch-wide by 5-foot-deep ~~trenches~~trench would be required to install the proposed ~~Valley–Ivyglen~~duct bank along 115 kV ~~line underground~~Segments ASP2 and ASP8. Where vaults are installed, the trench would be approximately 12 feet wide and approximately 14 feet deep. A minimum of 36 inches of cover above the duct bank is required (~~Figure 2-4~~Figure2-8). The location of underground utilities in proximity of the underground work (if any) would be marked. The trench line would be drawn on the ground, and a saw would be used to cut asphalt or concrete pavement as necessary. A backhoe or similar excavation equipment would be used to excavate the trench. Trenches would be widened and shored where appropriate to meet California ~~Occupation~~Occupational and Safety Health Administration requirements. Trenching would be staged so that the period during which trenches remain open would be minimized. Where trenches must remain open, steel plates would be placed over the trenches to allow for vehicle and pedestrian traffic. Provisions for emergency vehicle access would be ensured and arranged with local jurisdictions in advance of all trenching activities.

Trench width and depth may vary where a duct bank would cross or run parallel to other substructures. For substructures that operate at normal soil temperatures (e.g., gas lines, telephone lines, water mains, storm drains, or sewer lines), a minimal clearance of 6 inches for crossing and 12 inches for paralleling the substructures would be required. For substructures that operate at temperatures that substantially exceed normal soil temperature (e.g., other underground transmission circuits, primary distribution cables, steam lines, or heated oil lines), additional clearance may be required. Clearances and depths would meet the requirements established by Rule 41.4 of CPUC ~~General Order~~GO 128. In areas where underground utilities are highly congested or in areas where it is necessary to arrange underground conduit horizontally instead of vertically within the duct banks, flat configuration duct banks may be required. Trenches in this case would be shallower and wider. ~~Flat configurations are unusual, however, and the applicant does not anticipate that they would be required.~~

After installing the duct banks, the trenches would be backfilled with a sand and slurry backfill material. Excavated materials would be disposed of at an offsite disposal facility in accordance with all applicable laws and regulations. Should groundwater be encountered, it would be pumped into a holding tank and disposed of at an offsite disposal facility or other suitable location in accordance with all applicable laws and regulations.

Vault Installation

Vaults are below-grade concrete enclosures where underground electrical or telecommunications lines terminate, are spliced together, or transition to or from overhead positions. They are constructed of prefabricated steel-reinforced concrete and designed to withstand heavy truck traffic loading. They would typically be placed no more than 1,500 feet apart along the underground sections of the proposed subtransmission line. Initially, the vaults would be used as pulling locations to pull 115 kV conductor through the conduit. After the cable is installed, the vaults would be used to splice cables together. During operations, the vaults would provide maintenance access to the underground conductor.

~~Underground vaults~~An underground vault would be installed along 115-kV ~~Segments VIG1 and VIG8~~Segment ASP8 (Table 2-~~1~~2). The installation of ~~each~~the vault would take place over an approximately ~~one~~1-week period, depending on soil conditions. First, ~~each~~the vault pit would be excavated and shored; a minimum of 6 inches of mechanically compacted aggregate base would cover the bottom of each excavated pit. Vault delivery and installation would follow excavation. After ~~each~~the vault is set into the excavated pit, grade rings (for manhole cover placement) and the vault ~~casting~~ would be installed. After vault installation, ~~each~~the excavated pit would be backfilled with a sand and slurry material to a point just below the top of the vault roof. Excavated materials, if suitable, would be used to backfill the remainder of the excavation, and excess spoils would be disposed of at an ~~offsite~~off-site disposal facility in accordance with all applicable laws and regulations.

Underground Conductor Pulling, Splicing, and Termination

To pull the 115 kV conductor cable through the underground duct banks installed along 115-kV Segments ~~VIG1~~ASP2 and ~~VIG8~~ASP8, a cable reel would be placed at a vault at one end, and a pulling rig would be placed at a vault at the opposite end. The cable from the cable reel would be attached to a rope in the duct bank, and the rope would be linked to the pulling rig, which would pull the rope and the attached conductor through the duct banks. The process would be repeated moving from one vault to the next. A lubricant would be applied as the cable enters the ducts to decrease friction and facilitate travel through the conduit. The 115 kV conductor cables would be pulled through the conduit at a rate of two to three sections of conductor cable between vaults per day. After pulling is completed, the conduit sections would be spliced together within the vaults. A splice crew would conduct splicing operations at each vault location.

Riser Poles

At each terminus of the proposed underground ~~Valley–Ivyglen Project~~ 115 kV sections, the conductor would transition to an overhead position up a riser pole (~~Figure 2-4~~Figure2-8). There would be two riser poles installed along 115-kV Segment ~~VIG8~~ASP8, for example. One would be installed at the start of the segment and one at the end. The proposed riser poles would be TSPs that would support conductor termination hardware, lightning arresters, and dead-end hardware. Construction methods for riser pole installation would be similar to those described for TSP installation.

2.4.5.5 500-kV Tower Construction (Alberhill Project)

The applicant would construct the 500 kV transmission line using ~~one of~~ the following two ~~options~~methods:

- Conventional Method: ~~All~~Nine of the 12 towers would be constructed using ground construction methods.
- Helicopter Construction: ~~Eight~~Three of the 12 towers would be constructed using helicopters~~; the remaining four towers would be constructed using the conventional method~~.

The methods are described in detail below. Where activities would differ between methods, the methods are described separately.

Grading and Laydown Areas

Conventional Method

The new tower pad locations for the 500 kV transmission lines would first be graded and cleared to provide an adequately level and vegetation-free surface for footing construction. The graded area would be compacted to be capable of supporting heavy vehicular traffic. The applicant would grade the areas such that water would run toward the direction of the natural drainage and prevent ponding and erosive water flows that could cause damage to the tower footings.

Each tower site would require a laydown area of approximately 200 feet by 200 feet for tower assembly (Table 2-~~6~~7). In locations where the terrain in the laydown area is already reasonably level, only vegetation removal would be needed to prepare the site for construction. In locations where a level surface is not present, both vegetation clearing and grading would be necessary to prepare the laydown area for construction.

Tower installation may require construction of permanent crane pads to allow an erection crane to set up at an angle approximately 60 feet from the centerline of each structure. Crane pads would be located transversely (crosswise) from each applicable structure location. If pads are required, they would each occupy an area of approximately 50 feet by 50 feet and may extend outside of the 200-foot-wide ROW in proximity to some 500 kV tower locations. The precise locations that would require grading or crane pad construction cannot be determined until final engineering and, therefore, for the purposes of this document, it is assumed that crane pads could be required anywhere along the 500 kV transmission line routes.

Benching

In mountainous areas, benching may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. Benching is a technique in which a tracked earth-moving vehicle excavates a terraced access to excavation areas in steep and rugged terrain. Benching would be used, if needed, to help ensure the safety of personnel during construction activities and to control costs in situations where potentially hazardous, manual excavations would be required. The locations that would require benching cannot be determined until final engineering and, therefore, for the purpose of this document, it is assumed that benching could occur anywhere along the 500 kV transmission line routes.

Helicopter Construction

All material, equipment, and crew members would be flown via helicopter to each location where towers would be constructed using helicopters. Tower foundation sites for ~~eight~~three 500 kV towers would be graded and/or cleared to provide a sufficiently level and vegetation-clear surface for footing or micropile construction. Each tower site would require a laydown area of approximately ~~150~~200 feet by ~~150~~200 feet for equipment staging. Crane pads would not be required for towers constructed using helicopters.

Helicopter construction would require construction of ~~five~~three permanent helicopter ~~pads~~platforms that would be used for construction and operation. Helicopter ~~pads~~platforms would be approximately 24 feet by 24 feet and would be located within the 200-foot ROW. Each helicopter ~~pad~~platform would be built using six LWS poles of varying height as a foundation, depending on the slope of the terrain.

~~The remaining four towers would be graded as described for the conventional method.~~

Tower Foundation, Assembly, and Erection

~~Conventional Method:~~ Drilled Concrete Foundations

Each 500 kV transmission line tower would typically be constructed on four, drilled concrete foundations (~~footing~~footings). First, the four holes for the concrete footings would be bored using truck or track-mounted excavators with various diameter augers to match the diameter requirements for the footing. Next, steel-reinforced cages and stub angles would be installed. ~~Concrete would then be poured.~~ Steel-reinforced cages and stub angles would be assembled at the tower laydown area or at staging areas and delivered to each tower location by truck, where possible, and by heavy-duty helicopter, if necessary. Concrete would then be poured.

Depending on the terrain, equipment and material may need to be delivered at structure sites using a heavy-duty helicopter or by workers on foot, and crews may prepare the footings by hand using hydraulic or pneumatic equipment or other methods.

Micropile Foundations

Micropile foundations (footings) would be used in locations where drilled concrete foundations would not be suitable due to terrain and/or access considerations. First, steel platforms would be delivered to the site via truck or helicopter and installed over the tower footing locations. Once the platform is installed, a lightweight drill rig would be delivered to the site via truck or helicopter and bolted to the steel platform. The drill rig would drill several holes, which would measure approximately 4 inches in diameter. Steel rebar would be placed and grouted into each hole once the required depth is achieved. A stub angle pole would be installed, followed by pouring a concrete cap to encase all exposed portions of the micropiles.

Tower Assembly

At tower laydown or project staging areas, tower assembly would begin with hauling and stacking bundles of steel. This ~~activity requires~~would require the use of several tractors with trailers and a forklift or crane designed for use on rough terrain. After steel is delivered and stacked, crews would proceed with the assembly of tower leg extensions, body panels, boxed sections, and bridges. The assembled tower sections would be lifted into place with all-terrain or rough-terrain crane. Heavy-duty helicopters may also be used for 500 kV tower erection. The steel work would be completed by a combined erection and torquing crew with a boom crane. Insulators and wire rollers (travelers) for the conductor may also be installed at this time.

~~*Helicopter Construction: Micropile Foundations*~~

~~Micropile foundations (footing) would be used for eight towers. First, steel platforms would be flown to the site via helicopter and installed over the tower footing locations. Once the platform is installed, a lightweight drill rig would be flown to the site via helicopter and bolted to the steel platform. The drill rig would drill several holes, which would measure approximately 4 inches in diameter. Steel rebar would be placed and grouted into each hole once the required depth is achieved. A stub angle pole would be installed, followed by pouring a concrete cap to encase all exposed portions of the micropiles.~~

~~At the helicopter staging yard, tower assembly would begin with hauling and stacking bundles of steel. This activity requires the use of several tractors with 40-foot trailers and a forklift designed for use on rough terrain. After steel is delivered and stacked, crews would proceed with the assembly of tower leg extensions, body panels, boxed sections, and bridges. The assembled tower sections would be flown from the staging yard to each tower site using a heavy-duty helicopter.~~

~~Foundations and towers for the remaining four towers would be constructed as described for the conventional method.~~

Grounding and Snubbing: Core Reserve Access

The proposed 500 kV transmission line alignments (500 kV Line SA and 500 kV Line VA) and new 500 kV towers that would connect the proposed Alberhill Substation to the Serrano–Valley 500 kV Transmission Line would not be located within the boundary of the Core Reserve (Section 2.3.2.2, under the heading “Lake Mathews/Estelle Mountain Reserve”). Grounding and snubbing, however, would be required during construction of the ~~proposed Alberhill~~Proposed Project at towers M14-T2 and M14-T1, which are located within the Core Reserve boundary (Figure 2-~~2i~~2a). Equipment would not be positioned within land managed by the BLM.

Grounding

To ensure worker safety during construction within the applicant’s Serrano–Valley 500 kV Transmission Line ROW, the ~~applicant would ground the~~ Serrano–Valley 500 kV Transmission Line would be grounded at two ~~four~~ existing 500 kV tower sites: M14-~~T2, M14-~~T1 and M13-T3~~T2~~. No equipment other than pickup trucks, capstan hoists, clamps, and grounding cables would be required for grounding the two towers located within the Core Reserve (M14-~~T2 and M14-~~T1). At the other tower sites, additional equipment (e.g., bucket trucks for lifting workers) may be used. No grounding cables or rods would be installed into the ground. No ground disturbance would be required for grounding at any of the existing or proposed 500 kV tower sites.

To access the tower sites located within the Core Reserve, the applicant ~~estimates~~anticipates that construction crews would drive to ~~towers~~tower M14-~~T2 and M14-~~T1 (about 2.5 miles roundtrip) using pickup trucks on existing access and maintenance roads. Access to ~~towers~~tower M13-T3~~ and M13-T2~~ would also require ~~the applicant~~construction crews to drive on an existing access road that briefly passes through the Core Reserve boundary. Access to these tower sites would occur twice per day during 500 kV Tower SA6 and VA6 foundation installation and for wire snubbing: once to install grounds and once to remove them. The existing access and maintenance roads that would be used are shown on Figure 2-~~2i~~2a.

To install the grounds, first the Serrano–Valley 500 kV Transmission Line would be de-energized. Then workers would climb each of the four 500 kV lattice steel towers to install grounding clamps. Two clamps would be installed to the bridge of each tower for each of the three conductor phases[~~16~~][17] (two conductors per phase, six clamps per tower; Figure 2-10). The clamps would be connected by grounding cables to both the 500 kV conductors and the overhead ground wire. Once connected to the towers, the lattice steel towers would ground the transmission line conductors—provide a path from the transmission line conductors to the earth. If lightning strikes a transmission line conductor or tower or electricity otherwise energizes the 500 kV transmission line after it has been grounded, the electricity would travel down the lattice steel towers and into the earth. Workers would be able to safely work at existing tower site M13-T4 and proposed tower sites SA6 and VA6 (Figure 2-~~2i~~2a), which would be located between four grounded towers (M14-T2, M14-T1, M13-T3, and M13-T2). This grounding technique, which creates a safe area between grounds along a transmission line, is called bracket grounding.

Conductor and Overhead Ground Wire Snubbing

Conductor snubbing would be required for each of the three 500 kV transmission line conductor phases, which would be separated from existing 500 kV lattice steel tower M13-T4 and extended to the two proposed towers (500 kV Towers SA6 and VA6) within the existing 500 kV ROW. The term conductor snubbing refers to removing conductors from the insulators and securing them to utility structures ~~(Figure 2-10)~~. In this case, insulators are located between each of the conductors and the bridges of the 500 kV lattice steel towers. Snubbing ensures that the conductors are secured such that when they are separated (cut) they do not fall to the ground. Snubbing would also be required for the overhead ground wire.

Conductor snubbing would occur at the proposed 500 kV towers VA6 and SA6~~ 500 kV towers M14-T2, M14-T1, M13-T3, and M13-T2 and the proposed 500-kV towers VA6 and SA6. Between one and two conductor phases (two conductors each) would be snubbed to towers M14-T2, M14-T1 and M13-T3 or M13-T2. Multiple towers would be used for snubbing to ensure that the weight of the conductors does not damage any of the towers along the 500 kV transmission line. Conductor would also be snubbed as needed to the other proposed 500 kV towers (SA1 to SA5 and VA1 to VA5)~~ during conductor and overhead ground wire installation from the proposed substation, upslope to the Serrano–Valley 500 kV Transmission Line.

~~Rough terrain cranes, a man lift (e.g., bucket or boom truck), and crew truck would be used for conductor snubbing at the 500 kV tower sites, including towers M14-T2 and M14-T1 within the Core Reserve.~~ Grips would be installed on each conductor by workers raised by a man lift to the bridge level of the

[~~16~~][17] Three-phase, alternating-current electrical transmission systems use at least three conductors to transmit electricity. For the Serrano–Valley 500-kV Transmission Line, each of the three phases use two conductors. Each of the two side-by-side conductor cables are referred to as conductor bundles. Six conductor cables (i.e., three conductor bundles) are used to transmit electricity along the Serrano–Valley 500-kV Transmission Line.

towers. The grips would be connected to a hoist device that attaches to the tower. The conductors would be removed from the insulators and a crane would be used to raise the conductors to the tower bridge where they would be snubbed—affixed.

Access to the Core Reserve for snubbing would be required twice: first to ground and snub the conductors and overhead ground wire and then to remove the grounds and snubs. Snubbing would take approximately one workday. Snub removal would also take approximately one workday. The 500 kV transmission line would be grounded for the duration of the snubbing period. Once snubbed, the conductor and overhead ground wire snubs would not be removed until conductor and overhead ground wire installation for proposed 500 kV Line SA and 500 kV Line VA is completed. The process of stringing, pulling, tensioning, and splicing to install conductor on the 500 kV towers is described in Section 2.4.5.6, under the heading "500 kV Transmission Line Wire Stringing."

2.4.5.6 Wire Stringing

Wire stringing includes all activities associated with the installation of conductors onto a supporting structure. This activity includes the installation of sockline, hardline travelers, primary conductor, overhead ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Wire-stringing activities would be conducted in accordance with the applicant's specifications, which are similar to those of the Institute of Electrical and Electronic Engineers 524-2003 standard, Guide to the Installation of Overhead Transmission Line Conductors.

The applicant would prepare and implement a standard wire-stringing plan, which would outline the sequenced program of events to be conducted, starting with the siting of wire pulls and wire pull equipment set-up positions. Advanced planning determines circuit outages and safety protocols needed for ensuring the safe and quick installation of wire. To ensure the safety of workers and the public, safety devices such as traveling grounds (to maintain a continuous ground connection), guard structures, and radio-equipped roving, public safety vehicles, and linemen would be in place prior to the initiation of wire-stringing activities.

For major roadway crossings, typically one of the following methods is employed to protect the public:

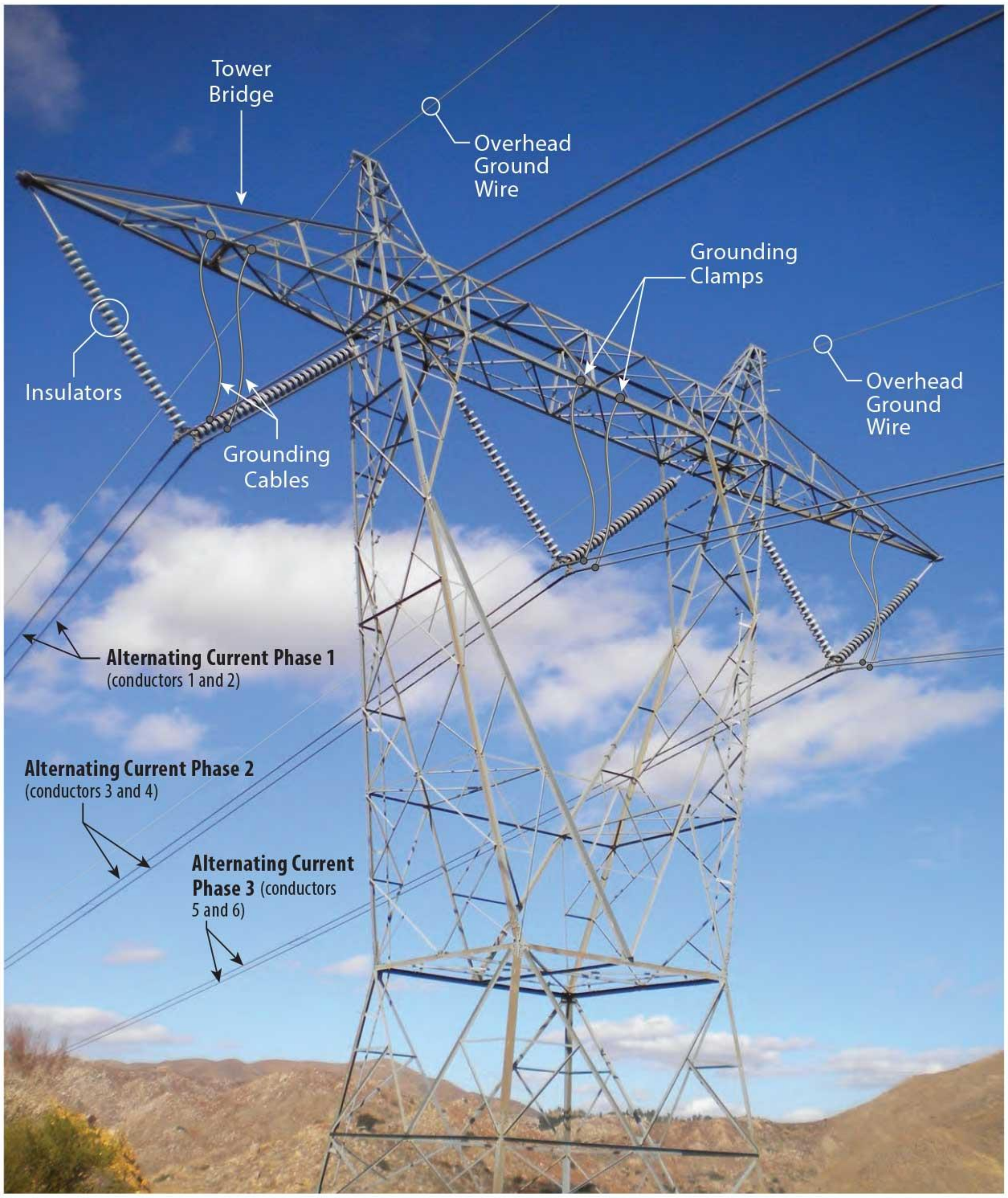
- Erection of a highway net and guard structure system
- Detour of all traffic off a highway at the crossing position
- Implementation of a controlled continuous traffic break while stringing operations are performed
- Strategic placement of special line trucks with extension booms on the highway deck

Depending on the permitting agency, the use of a secondary, safety take-out sling at highway crossings may be required.

Wire-Stringing Sites

The term wire-stringing site refers to areas where wire stringing, pulling, tensioning, and splicing activities occur to install conductor on an overhead electrical line. Wire-stringing sites are selected, where possible, based on the geometry of the line, terrain, and availability of dead-end structures. For stringing equipment that cannot be positioned at either side of a dead-end structure, anchoring and dead-end hardware would be temporarily installed to sag conductor wire to the correct tension.

Figure 2-10 500-kV Transmission Line Grounding (Alberhill Project)



Wire-stringing sites require level areas to allow for equipment maneuvering. When possible, these locations would be located on existing, level areas and existing roads to minimize the need for grading and cleanup. If necessary, however, wire-stringing sites would be graded. Wire pulls typically occur every 15,000 to 18,000 feet on flat terrain or less frequently in rugged terrain. Wire splices (the connection of two lengths of conductor) typically occur every 7,000 to 9,000 feet on flat terrain or less frequently in rugged terrain. The estimated number of wire-stringing sites and amount of disturbed area for these activities are specified in Tables ~~2-5 through,~~ 2-6 and 2-7.

The wire-stringing sites would, in general, be located within the linear orientation of the proposed transmission and subtransmission line routes at a distance of approximately three times the height of the proposed transmission and subtransmission structures. The approximate locations of wire-stringing sites for the proposed 500 kV transmission lines are shown in Figure 2-~~2i~~2a. The approximate locations of wire-stringing activities along the proposed 115 kV routes have not yet been specifically identified, but are expected to occur at locations where the width of the proposed 115 kV general disturbance areas increase as shown in Figures 2-6a through 2-~~6d~~6k. The precise location of each wire-stringing site would not be known until the applicant completes final engineering. For the purposes of this document, it is assumed that wire-stringing sites could occur anywhere along the proposed 500 kV transmission line or 115 kV subtransmission line routes.

500 kV Transmission Line Wire Stringing

Wire stringing for each of the proposed 500 kV transmission line routes would require a puller positioned at one end and a tensioner and wire-reel stand truck positioned at the other end. The puller would be positioned at the Serrano–Valley 500 kV Transmission Line end of the proposed SA and VA 500 kV transmission lines. It would be located within the applicant's existing ROW for the Serrano–Valley 500 kV Transmission Line. The tensioner and wire-reel stand truck would be positioned at the proposed Alberhill Substation site. Splicing sites between lengths of transmission cable would be located as needed within the 200-foot ROW for the proposed 500 kV transmission line routes.

The following four steps describe the wire-stringing process:

1. Sock-Line Threading: A light-duty helicopter would fly a lightweight sock line from structure to structure, which would be threaded through wire rollers installed on the transmission line structures. A cam-lock device would be engaged during threading that secures the sock line to the rollers.

2. Pulling/Tensioning: The sock line would be used to pull hardline-pulling cable onto the transmission line structures. The hardline-pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications caused by twisting as the conductor unwinds off the reel. A piece of hardware known as a running board would be installed to feed the conductor into the wire roller. This device keeps the conductor from wrapping during installation. The new conductor would be installed by utilizing conductor tensioning equipment at the conductor end of the pull.

3. Splicing, Sagging, and Dead-Ending: Depending on conductor ~~cable~~ lengths and the lengths of spans between structures, temporary mid-span splices may be installed during the conductor pulling process. Temporary pulling socks are removed and permanent splices installed once the conductor is threaded through the wire rollers located on each structure. The temporary socks are necessary because the permanent splices used to join conductor together cannot travel through the rollers.

After permanent splicing is completed, the conductor would be sagged to proper tension and attached to the dead-end structures.

4. Clipping In: After conductor is dead-ended, the conductors would be attached to the transmission line structures—a process called clipping in.

Overhead Ground Wire

Overhead ground wire would be installed along the tops of the 500 kV transmission line structures. It would be installed in the same manner as the conductor and is typically installed in continuous sections of 11,000 feet or less, depending upon factors such as line direction, slope, and accessibility.

Core Reserve Access

If wire-stringing equipment is required to be placed outside the existing Serrano–Valley 500 kV Transmission Line ROW, it would be placed on an existing access road. If wire-stringing equipment must be positioned within or partially within the Core Reserve (Section 2.3.2.2, under the heading “Lake Mathews/Estelle Mountain Reserve”), the equipment would be backed up onto the existing access road or other areas within the Core Reserve while being monitored by a qualified biologist (Section 4.4, “Biological Resources”). The applicant anticipates that wire-stringing equipment and associated vehicles would be required to back up onto existing access roads or other areas within the Core Reserve adjacent to the proposed sites for 500 kV Towers SA6 and VA6 and adjacent to existing tower sites M13-T4, M13-T3, and M13-T2 (Figure 2-~~2i~~2a).

To avoid or minimize locating equipment within the Core Reserve or on land managed by the BLM, the applicant would employ a technique called slack spanning. Typically, wire-pulling locations are set up behind transmission line structures (in-line with/parallel to transmission line alignments), but in this case wire-pulling locations would be placed to the side (offset) of the transmission line alignments as shown by the wire stringing sites identified on Figure 2-~~2i~~2a within the Serrano–Valley 500 kV Transmission Line ROW. Standard wire-stringing processes and equipment are used when slack spanning, but shorter conductor leads and lesser tensions are applied to ensure that tower loading specifications are not exceeded.

115 kV Subtransmission Line Wire Stringing

Conductor would be installed on the proposed 115 kV wood~~ poles, hybrid~~ poles, LWS poles, H-frame structures, and TSPs as previously described for 500 kV transmission line stringing, except ~~for the proposed Alberhill Project and proposed Valley–Ivyglen Project 115 kV lines for which ~~a boom truck would typically be used to string the sock line instead of a light-duty helicopter. Light-duty helicopters would be used for wire stringing along the 115 kV segments specified in Section 2.4.5.2.

Guard Structures

Guard structures are temporary facilities designed to stop conductor from falling should it drop below stringing height. For ~~both of ~~the ~~proposed projects~~Proposed Project, guard structures would be used for 115 kV subtransmission line wire stringing that occurs on either side of highways, streets, railroads, trails, and flood control facilities or where other overhead utilities are present to prevent conductor from falling onto these areas. Guard structures are typically wood poles, 60 feet to 80 feet tall, and depending on the width of the conductor being constructed, the number of guard poles installed on either side of a crossing would be between two and four.

Guard structures are installed using similar methods to those required for the installation of permanent wood poles. Each guard structure would be installed within an approximately 2-foot-diameter hole. Guard structures are removed after the conductor is secured into place. In some cases, the wood poles could be substituted with the use of boom-type trucks with heavy outriggers staged to prevent the conductor from dropping. Additionally, temporary netting may be installed, if required.

2.4.5.7 De-energizing and Energizing the Transmission and Subtransmission Lines

The applicant estimates that the Serrano–Valley 500 kV Transmission Line would be de-energized for a minimum of 30 days to install the proposed 500 kV conductor and overhead ground wires. The maximum length of the electrical outage would be determined ~~by the~~ upon final construction planning. The California Independent System Operator reviews and approves outages based on system conditions and other outages occurring in the same time frame.

De-energizing the Serrano–Valley 500 kV Transmission Line to install and connect the proposed lines would occur at a time of year when electrical demands are lower (off-peak) to reduce effects of the outage. Once the proposed transmission lines are connected to the existing line, the ~~existing line would be returned to service and the~~ new lines would be energized.

The final step in completing construction of the 500 kV transmission line segments and the new and modified 115 kV subtransmission lines involves energizing the new conductor. To accomplish this, the existing lines in service would be de-energized, and the connections between the new and modified lines would be made. De-energizing and connecting the new lines to the existing system would typically occur when electrical demand is low in order to reduce the need for electric service outages. Once the connection is complete, the existing lines would be returned to service and the new facilities would be tested and then energized.

2.4.6 Alberhill Substation Construction (Alberhill Project)

2.4.6.1 Demolition of Horse Ranch Facilities and Weed Abatement

The applicant owns the site proposed for the Alberhill Substation. The site had previously been used as a horse ranch. At the time that the applicant filed an application for the proposed Alberhill Project in September 2009, the applicant did not own the horse ranch property. During preparation of this document, the applicant purchased the property and, at that time, residents were living at the site. Subsequent to the sale of the property to the applicant, the residents moved out.[~~17~~18]

2011 Demolition and Weed Abatement

In compliance with a Notice of Defects issued by the County of Riverside Department of Building and Safety on May 26, 2011 and a Notice of Violation issued by the County of Riverside Transportation and Land Management Agency on June 9, 2011, the applicant removed the aboveground components of one single-family residence, one mobile home, two garages, one barn, one shed, and a concrete animal shelter from the proposed Alberhill Substation site during demolition and weed abatement activities conducted from September 8 through September 20, 2011 (County of Riverside Demolition Permits #BDE110047, #BDE110048, #BDE110049, #BDE110050, and #BDE110068). The applicant removed the aboveground components of a potentially historic resource identified at the proposed Alberhill Substation site (a second single-family residence) during demolition activities conducted from December 12 through December 15, 2011 (County of Riverside Demolition Permits #BDE110068). The removal took place after receiving a

[~~17~~18] The demolition of horse ranch facilities was described as part of the proposed Alberhill Project in the Proponent's Environmental Assessment (PEA) submitted by the applicant in 2009. The applicant proposed to remove horse ranch demolition from their updated PEA in 2011, but the CPUC elected to retain horse ranch demolition and weed abatement activities in the EIRs' description of the proposed Alberhill Project.

letter from the California State Historic Preservation Office that concurred with the applicant's findings that the structure was not significant pursuant to California Register of Historical Resources criteria (Stratton 2011).

Nine acres of weeds/grass land were mowed with a tractor (weed abatement) and a water truck was onsite to keep mowed areas wet for dust control and fire safety during weed abatement activities. No foundations were removed and no grading occurred during the demolition activities conducted in 2011. No wells or septic tank pits were abated at the horse ranch in 2011, but four septic tanks and associated leach areas would be abandoned and abated prior to construction of the ~~proposed Alberhill~~Proposed Project pursuant to methods approved by the County Building Official. No contaminated soil or groundwater were encountered during demolition activities conducted in 2011.

At the time of publication of this document, no homes or residences are located on the proposed Alberhill Substation site. Nonetheless, demolition of the horse ranch facilities, including those demolished during the preparation of this document to comply with County of Riverside code enforcement, is considered part of the ~~proposed Alberhill~~Proposed Project. The remaining horse ranch facilities, including the belowground components (foundations) of the facilities demolished in 2011, stables, corrals, and fences would be removed prior to commencement of site grading. Additional materials that would be removed would include soil, wood, metal, rock, cement, green waste, and fiberglass. All materials would be delivered to approved disposal, recycling, or landfill facilities. Hazardous and non-hazardous waste disposal for horse ranch demolition activities conducted in 2011 are discussed in Sections 2.4.4.7 and 2.4.4.8.

Best Management Practices for Demolition and Weed Abatement (2011)

The applicant conducted a nesting bird assessment and bat survey prior to demolition and weed abatement activities and environmental monitoring during demolition and weed abatement activities (Section 4.4, "Biological Resources"). An archaeological monitor provided training prior to weed abatement and demolition activities, but was not present during weed abatement or demolition because there was no ground disturbance. In addition, lead and asbestos air monitoring and abatement was performed for demolition activities conducted in 2011 (McKenna Environmental 2010).

The BMPs implemented by the applicant during demolition and weed abatement activities that occurred in 2011 included:

- Applying water to prevent the generation of visible dust plumes and stabilize wind-erodible surfaces, surfaces where equipment and vehicles operate, loose soils, and demolition debris;
- Compliance with SCAQMD Rule 403 (Fugitive Dust) and Rule 1403 (Asbestos Emissions from Demolition Activities);
- Conducting demolition after nesting season (in general, after August 31) and during daytime hours (to reduce the potential for impacts on bats and other nocturnal species);
- Conducting bat clearance surveys three days prior to demolition;
- Conducting biological monitoring for birds, bats, and other wildlife during weed abatement and demolition activities;
- Preventing the disposal of rinse or wash waters, oil, grease, fuel, waste, or other materials onto impervious or pervious site surfaces or into storm drains; and

- Implementing the following California Stormwater Quality Association BMPs, among others: scheduling (the sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking weather into consideration), water conservation practices, vehicle and equipment maintenance, spill prevention and control, and waste management.

A complete list of BMPs for weed abatement and demolition activities at the proposed Alberhill Substation site is provided in Appendix C.

2012 Weed Abatement

On March 31, 2012, the applicant received a Notice of Violation and Order to Abate from the Riverside County Fire Department. To comply with the Order to Abate, from April 25 to April 28, 2012, the applicant mowed approximately 2 acres of land along Concordia Ranch Road, east of the road's intersection with Temescal Canyon Road. One of the two parcels mowed was partially located within the footprint of the disturbance area for the proposed Alberhill Substation. The vegetation mowed was up to 4 feet tall, and the mower cut vegetation to 4 inches above the ground. The Riverside County Habitat Conservation Agency does not require that property owners obtain permission to abate weeds within areas located within the Stephens' Kangaroo Rat Habitat Conservation Plan coverage area (Section 4.4, "Biological Resources") when ordered by the Riverside County Fire Department as long as weed abatement only occurs within the abatement area specified in the Order to Abate (Barton 2012).

Water Well Destruction and Septic System Abandonment and Abatement

As further discussed in Section 4.8, "Hazards and Hazardous Materials," a Phase I Environmental Site Assessment was conducted for the proposed Alberhill Substation site. The Phase I Environmental Site Assessment identified four septic tanks and associated leach areas, two water wells, and an aboveground water tank (Rubicon Engineering Corporation 2009a). The applicant would abandon and abate the septic system in accordance with the requirements of an Underground Storage Tank Closure Permit and may destroy the water well in accordance with a Well Permit, both of which are issued by the Riverside County Department of Environmental Health. In addition, the applicant would ~~disposed~~dispose of the water in an aboveground tank located at the proposed Alberhill Substation site (Rubicon Engineering Corporation 2009b) at a facility licensed to accept water contaminated with oil and grease, and the water tank would be removed and disposed of in accordance with all applicable laws and regulations.

If the water wells are destroyed, once the Well Permit (to destruct) is approved, water wells are sealed by a well contractor registered with Riverside County. The contractor typically would remove the well pump, the inner pipe to the pump, and any material or obstructions in the well. A sealant pipe would be installed within the bottom of the well's borehole. A County-approved sealant would be pumped to fill the well from the bottom up. Once the well is capped, a driller's report would be submitted to the County.

For septic system abandonment and abatement, the applicant would submit a work plan as part of the permitting process. The applicant would test and abate for flammable vapor in the tanks prior to removal or abandonment in place. If the septic tanks are to be abandoned in place, soil surveys would be performed below and around the tank. If the septic tanks are to be removed, soil surveys would be performed after the tank is removed. All associated piping would typically be removed. Requirements specific to the septic systems at the proposed Alberhill Substation site would be identified as part of the Underground Storage Tank Closure permitting process.

2.4.6.2 Fill, Grading, and Surface Materials

The area to be enclosed by the perimeter wall of the proposed Alberhill Substation would be graded and compacted, and fill would be imported to create an even slope that varies between 1 and 2 percent. The site would slope downward from east to west, parallel with Temescal Canyon Road and perpendicular to Love Lane. The ground surface of the proposed substation site would be improved with imported materials as well as materials excavated from the site (Table 2-~~12~~11). Approximately ~~80,000~~70,000 cubic yards of soil would be imported as fill during grading, if necessary.~~[18]~~[19] The applicant would clear vegetation at the proposed Alberhill Substation site prior to grading and then retain at the site any excess soil resulting from grading, excavation, and other earth-moving activities.

Import Soil Options

The applicant would, if necessary, obtain the fill required for the proposed substation site using one of the following two options:

- Import Soil Option 1 (5.2-Acre Source Area): Excavate a 5.2-acre area (227,000 square feet), the Import Soil Source Area, which would be located adjacent to the northeast side of the proposed substation site; or

- Import Soil Option 2 (Local Quarry): Truck in soil from a quarry, such as Corona Rock and Asphalt (also known as Vulcan Materials Company–Western Division or Corona Quarry) or other import source,~~),~~ which is located approximately 32 miles from the proposed substation site at 1709 Sherborn Street, Corona, California. The entire ~~80,000~~70,000 cubic yards of soil would be hauled to the proposed Alberhill Substation site during a 60-day period by dump trucks with an estimated capacity of 14 cubic yards each. Approximately ~~96~~84 roundtrips to the site would be required per day (~~192~~168 one-way truck trips) for approximately ~~11,500~~10,080 one-way truck trips.

Initial estimates indicate that the 5.2-acre Import Soil Source Area could provide up to 120,000 cubic yards of soil. A geotechnical study would be completed during final engineering for the proposed Alberhill Project to determine if the Import Soil Source Area would be capable of providing the required ~~80,000~~70,000 cubic yards of soil. If geotechnical study recommendations require that a retaining wall or another type of earth-retaining structure would be required for the Import Soil Source Area, new visual simulations and additional environmental analysis pursuant to ~~CEQA~~the California Environmental Quality Act (CEQA) may be required.

It is possible that some combination of Import Soil Options 1 and 2 would be used to provide the ~~80,000~~70,000 cubic yards of soil for construction of the proposed substation. If, for example, the geotechnical study completed during final engineering of the proposed Alberhill Project indicates that the Import Soil Source Area cannot provide the entire ~~80,000~~70,000 cubic yards of soil, the additional soil required may be trucked to the site. If both import soil options are implemented for the import of soil, all project commitments and mitigation measures included in this document that would reduce impacts specific to one import soil option or the other would be applicable to construction of the proposed Alberhill Project.

~~[18]~~[19] ~~The applicant estimates~~Preliminary engineering suggests that grading would require ~~91,000~~118,100 cubic yards of soil be cut and ~~157,700~~184,700 cubic yards be filled at the proposed substation site. ~~An additional 11,000 cubic yards of fill would be required due to subsidence. In total, the applicant estimates that 77,700 cubic yards of fill would be required, which has been rounded for the sake of this analysis to approximately 80,000 cubic yards.~~

Table 2-~~12~~11: Alberhill Substation Ground Surface Materials (Quantities Estimated)

Alberhill Substation Site	Material	Approximate Surface Area (acres)	Approximate Volume (cubic yards)
Site grading, cut	Soil	~~21.880~~23	~~91,000~~118,100
Site grading, fill[(a)]	Soil	~~21.880~~23	~~168~~184,700
Drainage structures	Concrete	~~0.503~~0.5	~~900~~910
Substation equipment foundations	Concrete	~~1.449~~1.4	15,000
Excavation for foundation and building footings[(b)]	Soil	~~1.449~~1.4	15,000
Cable trenches[(c)]	Concrete	~~< 0.04002~~< 0.2	~~556~~734
Water line relocation	Soil	~~0.23~~0.2	3,500
Internal driveways and parking	Asphalt, concrete, Class II aggregate base	~~4.820~~3.6	~~2,500~~1,500 (asphalt, concrete) 3,000 (aggregate)
External roads	Asphalt, concrete, Class II aggregate base	~~0.739~~0.7	~~300~~400 (asphalt, concrete) ~~500~~600 (aggregate)
Rock surfacing	Crushed rock	~~25.724~~19	~~10,800~~10,000
Wall foundation	Concrete	~~< 0.038~~ < 0.5	~~500~~1,290
Import Soil Source Area[(d)]	Soil	~~6.712~~6.7	~~80,000~~70,000[(e)]

~~Source: SCE 2009~~

Notes:

(a) Includes allowances for shrinkage and settlement.

(b) Soil excavated for foundation and building footings would be stockpiled during excavation and later would be graded and compacted onsite.

(c) Concrete cable trenches are factory fabricated and would be delivered rather than poured on site.

(d) The Import Soil Source Area, which is located adjacent to the northeast side of the proposed substation site, would only be excavated if Import Soil Option 1 is selected for construction of the proposed Alberhill Substation.

(e) The applicant estimates that the Import Soil Source Area could provide up to 120,000 cubic yards of soil, but ~~only 80,000~~approximately 70,000 cubic yards would be required for the proposed Alberhill Project.

(f). All quantities are estimates based on preliminary engineering.

Preliminary Drainage Design

~~An~~Two external detention ~~basin~~ basins (total volume of ~~13.5~~approximately 16 acre-feet) located at the northern corner and eastern edge of the site ~~between~~outside the proposed substation wall ~~and Love Lane~~ would capture and detain surface flow from within the enclosed substation and from the hills to the north and northeast outside the substation walls. Surface flow would be gathered by gravity into concrete swales and directed ~~from east to west~~ into the ~~basin~~basins. A surface flow energy dissipation field would be constructed to reduce the velocity of water captured by the swales. Percolation would dissipate water captured by the detention ~~basin~~basins to reduce excess discharge from the proposed substation site. Excess discharge from the ~~basin~~basins would be conveyed through drainage pipes south to existing discharge points that flow into Temescal Wash.

Surface runoff from the south side of the proposed substation site near Concordia Ranch Road would be collected in drainage pipes and discharged from the property at an existing discharge point that flows into Temescal Wash. Additional detention basins would be incorporated into the drainage design if the 5.2-acre Import Soil Source Area is excavated as part of Import Soil Option 1 (see previous discussion) or if deemed necessary during final engineering for the proposed Alberhill Project ~~(JLC Engineering and Consulting, Inc. 2011; SCE 2011)~~. The final drainage design, which would be based on final geotechnical and soil evaluation results, would be reviewed and approved by Riverside County.

Spill Prevention, Control, and Countermeasure Plan

The grading design for the proposed substation site would incorporate requirements from the Spill Prevention, Control, and Countermeasure (SPCC) Plan because of the planned operation of oil-filled transformers at the substation. Typical SPCC Plan features include secondary containment, curbs, berms, and basins designed and installed to contain spills should they occur. During construction, BMPs for erosion and drainage control would be implemented as specified in the SWPPP (Section 2.4.4.3).

2.4.6.3 Below-Grade and Above-Grade Facility Installation

After the proposed substation site is graded, below-grade facilities would be installed. Below-grade facilities would include a ground grid, trenches, building foundations, equipment foundations, utilities, and the base of the proposed substation wall. Above-grade installation of proposed substation facilities (e.g., capacitor banks, switchracks, transformers, and control building) would commence after the below-grade structures are in place. The design of the ground grid would be based on soil resistivity measurements collected during the geotechnical study that would be conducted prior to construction.

2.4.6.4 Transformer Delivery and Installation

The transformers would be delivered to the proposed Alberhill Substation by heavy-transport vehicles and off-loaded onsite by large cranes with support trucks. The applicant may use a traffic control service to facilitate transformer delivery, if necessary.

2.4.7 Telecommunications Installations

2.4.7.1 Fiber Optic Line Installation

The fiber optic line would be installed overhead and underground on various segments of the ~~proposed projects~~Proposed Project as described in Sections 2.3.1.2; Table~~s 2-1 and~~ 2-2; and Figures 2-5a through 2-~~5d~~5f. The overhead fiber optic line would be *underbuilt*—installed on the proposed 115 kV structures below the 115 kV circuits—on crossarms that are 5 to 10 feet wide. The fiber optic lines would be installed in a manner similar to that described above for subtransmission wire stringing. The applicant would not install new poles or replace poles specifically to support the fiber optic lines.

The underground fiber optic line sections would be installed within trenches that would be approximately 18 inches wide and 36 inches deep. A minimum of 3 inches of slurry, dirt, and gravel would be placed on top of the conduit and then the trench would be backfilled. Excess excavated soils would be disposed of offsite in accordance with all laws and regulations. Underground sections may be as long as 2,000 feet. Vaults or pull boxes (which are, essentially, small vaults) would be installed at the ends of each underground section for splicing fiber optic line sections and for pulling line through the conduit. Vaults and pull boxes are used during operations to access the fiber optic line for maintenance.

2.4.7.2 Microwave System Construction (Alberhill Project)

A 120-foot microwave tower would be installed at the proposed Alberhill Substation. Tower material would be delivered by truck and staged at the proposed substation site. After the tower foundation is installed, each tower section would be assembled onsite and erected using a crane and a bucket truck. The microwave dish antenna would be installed on the tower using the bucket truck.

As part of the proposed Alberhill Project, three microwave dish antennas would be installed on existing communication towers at the Santiago Peak Communications Site (two antennas) and the applicant's Serrano Substation (one antenna). The existing communications tower at the Santiago Peak Communications Site would be strengthened because of the additional load from the two new microwave dish antennas proposed to be installed at about 45 feet above ground level. Nine cross members on the existing communications tower would be replaced. In addition, two of the applicant's microwave dish antennas located on the communications tower at an elevation of about 100 feet would be lowered to an elevation of about 35 feet. After installation, there would be a total of seven dish antennas on the communications tower. The applicant stated that up to eight dish antennas could be installed without overloading the communications tower. Modifications to the existing tower and microwave antenna installation would be accomplished using a gin pole—a rigid pole with a pulley on the end that is attached to a communications tower and used for raising objects (e.g., new antennas or additional tower sections to increase the height of a tower).

Work on the Santiago Peak communications tower is expected to be completed on 12 days during the course of six weeks and would be scheduled depending on weather. Lowering of the two existing dish antennas and installation of the two new antennas would not result in interruption to electrical service. Work would only be performed during daylight hours.

All work involving the applicant's telecommunication system is coordinated with the applicant's Grid Control Center. Some of the communication system circuits are used for powerline protection, and the Grid Control Center would decide, based on electrical power flow and other conditions, if reduced powerline protection capability is acceptable for a given time period. The communication outage would likely be timed to occur during non-summer months to avoid peak electrical use conditions. The communication outage would not interrupt electrical service.

2.4.8 Additional Substation Modifications

The required modifications to six existing substations are described in Section 2.3.2.6. These modifications would involve the installation of new substation equipment, removal of existing substation equipment and foundations, and the installation of new wiring and equipment throughout the substation. These activities would be conducted entirely within the existing substation footprints and utilize construction methods similar to those identified for the proposed Alberhill Substation in Section 2.4.6.

2.5 OPERATION AND MAINTENANCE OF THE PROPOSED PROJECTS

The applicant inspects transmission and subtransmission lines or segments of the lines at least once per year by driving and/or flying by helicopter along the routes. ~~The applicant inspects the entire Serrano–Valley 500 kV Transmission Line by helicopter every other year.~~ The additional time needed to inspect the proposed 500 kV and 115 kV lines would be minimal. The new 500 kV lines and new and modified 115 kV lines would be maintained in a manner consistent with CPUC ~~General Order~~GO 165, Inspection Cycles for Electric Distribution Facilities. In the event of an emergency and for certain maintenance conditions, helicopters may be used to locate and access affected areas along the proposed 500 kV or 115 kV lines to minimize response and repair times.

The telecommunications system for both of the proposed projects would require routine maintenance, which would include equipment testing, monitoring, and repair. No additional personnel, beyond the applicant's normal staffing levels, would be required for routine telecommunications maintenance along the proposed transmission and subtransmission lines or to operate or maintain the telecommunications system at the proposed Alberhill Substation and other substations that would receive telecommunications components as part of the ~~proposed Alberhill~~Proposed Project. The new telecommunications equipment to be installed at the applicant's Valley, Newcomb, Skylark, Elsinore, Fogarty, Ivyglen, Mira Loma, Serrano, Vista, Tenaja, Barre, and Walnut substations; Irvine Operations Center; and the Santiago Peak and Box Springs communications sites as part of the ~~proposed Alberhill~~Proposed Project would be maintained in conjunction with the telecommunications equipment that already exist at these facilities. Approximately once per year, one individual would perform routine maintenance of the telecommunications components located at the substations.

The proposed Alberhill Substation would be unstaffed, and electrical equipment within the proposed substation would be remotely monitored and controlled by an automated system from the applicant's Valley Substation Regional Control Center. Components of the proposed projects would require routine maintenance and may require emergency repair for electrical service continuity. The applicant's personnel would visit the proposed Alberhill Substation for electrical switching and routine maintenance purposes. Routine maintenance would include equipment testing, equipment monitoring, and repair.

The applicant's personnel would inspect the proposed Alberhill Substation at least once per week from the applicant's Valley Switching Center located at Valley Substation. No additional vehicle trips other than routine trips already conducted for the operation and maintenance of applicant facilities are expected due to operation of the proposed projects. No vehicles would be permanently stationed at the proposed Alberhill Substation.

2.5.1 Water Use during Operations

Water would be used for equipment cleaning, the restroom, and landscaping irrigation during operation and maintenance of the proposed Alberhill Substation. Approximately 3,000 gallons per year of de-ionized water would be used for cleaning electrical equipment at the proposed substation during operations. The water, which is provided by the local water agency and then de-ionized at the applicant's Valley Substation, would be transported to the proposed Alberhill Substation once per year. All other water used for operation and maintenance of the ~~proposed projects~~Proposed Project, including landscaping for the proposed Alberhill Substation, would be supplied by the local water agency. The proposed Alberhill Substation would be unattended. A minimal amount of water would be used for the proposed restroom.

There would be no water used for dust suppression for routine operation and maintenance of the proposed transmission and subtransmission lines. There would be no water used to perform line cleaning (insulator washing). The applicant would use polymer insulators that do not require cleaning or washing.

2.5.2 Chemical Storage and Use (Alberhill Project)

The applicant would keep the following chemicals at the proposed Alberhill Substation during operation of the proposed Alberhill Project (see Table 2-2 for quantities):

- Transformer (mineral) oil used as insulating media in the two 500/115 kV transformers;
- Diesel (Low-Sulfur Diesel No. 2) used as fuel for the backup generator;
- SF_6 gas used as insulating media in the 500 kV ~~switchracks~~ and 115 kV circuit breakers; and
- Lead-calcium batteries stored in the control room (no quantity specified by the applicant).

2.5.3 Gas-Insulated Equipment (Alberhill Project)

The insulating media in the ~~proposed 500 kV switchracks and 115 kV~~ circuit breakers at the proposed Alberhill Substation would be SF_6 gas, which is one of the four primary greenhouse gases as defined by the Kyoto Protocol (Section 4.7, “Greenhouse Gases”). All gas-insulated equipment purchased and installed by the applicant, including the equipment that would be installed as part of the proposed Alberhill Project, has a manufacturer’s certified leak rate of 0.5 percent per year or less. As older equipment is replaced, newer manufacturer-certified equipment is installed to meet this SF_6 specification.

Pursuant to Title 17 of the California Code of Regulations (CRR), Sections 95350 – 95359, SF_6 emissions, including emissions from the proposed gas-insulated equipment, once operational, will be reported to the California Air Resources Board. The applicant will comply with the Maximum Annual SF_6 Emission Rates established in CCR Title 17, section 95352, which, ~~by~~as of 2020, ~~would be~~are 1 percent per year for all gas-insulated equipment.

2.5.4 Electric and Magnetic Fields

~~EMFs~~Electric and Magnetic Fields (EMFs) occur both naturally and as a result of human activity across a broad electrical spectrum. Naturally occurring EMFs are caused by the weather and the earth’s geomagnetic field. The fields caused by human activity result from technological application of the electromagnetic spectrum for uses such as communications, appliances, and the generation, transmission, and local distribution of electricity.

After several decades of study regarding potential public health and safety risks associated with EMF from power lines, research results remain inconclusive. In 1993, the ~~California Public Utilities Commission (~~CPUC~~)~~ implemented decision D.93 11-013, which requires utilities to use “low-cost or no cost” EMF reduction measures for EMFs associated with electrical facilities requiring certification under CPUC GO 131-D. The decision directed utilities to use a 4 percent benchmark for low-cost measures. The applicant included a Field Management Plan as part of its applications for the ~~proposed projects~~Proposed Project that describes the EMF reduction measures that would be part of the ~~proposed projects~~Proposed Project. This decision also implemented a number of EMF measurement, research, and education programs. The CPUC did not adopt any specific numerical limits on or regulation of EMF levels related to electric power facilities.

The CPUC’s January 27, 2006, decision (D.06-01-042) affirmed the 1993 decision on the low-cost/no cost policy to mitigate EMF exposure for new utility transmission and substation projects. Additionally, the 2006 decision directs the CPUC’s Energy Division to pursue and review all available studies regarding EMF and to review scientific information and report on new findings. The CPUC has been unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences, and no change to the CPUC EMF policy has been made to date. The CPUC will reconsider its EMF policies and open a new rulemaking, as necessary, if new findings indicate negative EMF health impacts.

At present, the CPUC does not consider EMFs, in the context of the ~~California Environmental Quality Act (CEQA),~~CEQA, to be an environmental impact because there is no agreement among scientists that EMFs create a potential health risk and because CEQA does not define or adopt standards for defining any potential risk from EMFs. Therefore, EMFs are not addressed in the Environmental Impacts and Mitigation Measures section of this document. For further information about EMFs and CPUC guidelines, refer to the CPUC's web page: ~~http://www.cpuc.ca.gov/PUC/energy/Environment/ElectroMagnetic+Field~~ https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/permitting-and-environmental-review/electric-magnetic-fields.

2.6 PROJECT COMMITMENTS

The applicant has committed to the items listed in Table 2-12 as part of the design of the proposed projects. Unless otherwise specified, the following Project Commitments apply to both of the proposed projects.

Table 2-~~1312~~12 Project Commitments

Project Commitment A	**Landscaping and Irrigation Plan.** For the Alberhill Project, prior to the start of construction, the applicant would develop a Landscaping and Irrigation Plan for Alberhill Substation road frontage only along Temescal Canyon Road, Concordia Ranch Road and Love Lane that is consistent with surrounding community standards, substation security and safety requirements. The applicant would consult with Riverside County about the Plan and incorporate applicable County recommendations to the extent possible. Landscaping would be designed to filter views from the surrounding community and other potential sensitive receptors near the proposed substation and be consistent with the surrounding community. The landscape plan would include a plant species list and installation and construction requirements. The applicant would contract a landscape architect to complete the landscaping plan during final engineering for the Alberhill Project. Irrigation and landscaping installation would occur after construction of the substation perimeter wall, subtransmission and transmission poles/towers erected, underground utility lines/cable ducts installed and water service has been established. During operations, the applicant would maintain the substation site pursuant to the Landscaping and Irrigation Plan and be responsible for upkeep as long as the applicant owns the property.
Project Commitment B	**Worker Environmental Awareness Plan.** Prior to construction of the proposed projects, a Worker Environmental Awareness Plan would be developed based on final engineering designs, the results of preconstruction surveys, project commitments, and mitigation measures imposed by the California Public Utilities Commission. A presentation would be prepared by the applicant and shown to all site workers prior to their start of work. A record of all trained personnel would be kept with the construction foreman. In addition to the instruction for compliance with any site-specific biological or cultural resource protective measures and project mitigation measures, all construction personnel would also receive the following: • A list of phone numbers of the applicant's personnel with the (archeologist, biologist, environmental coordinator, and regional spill response coordinator); • Instruction on the South Coast Air Quality Management District Rule 403 for control of dust; • Instruction on what typical cultural resources look like, and if discovered during construction, to suspend work in the vicinity of any find and contact the site foreman and archeologist or environmental coordinator;

	• Instruction on individual responsibilities under the Clean Water Act, the Storm Water Pollution Prevention Plan for the projects, site-specific Best Management Practices, and the location of Material Safety Data Sheets for the projects; • Instructions to notify the foreman and regional spill response coordinator in case of hazardous materials spills and leaks from equipment or upon the discovery of soil or groundwater contamination; • A copy of the truck routes to be used for material delivery; and • Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the projects.
Project Commitment C	**Raptor Protection on Power Lines.** The applicant would design all 115-kV subtransmission structures consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).
Project Commitment D	**Habitat Restoration and Revegetation Plan.** With input from the appropriate resource agencies, the applicant would develop and implement a Habitat Restoration and Revegetation Plan to restore temporarily impacted areas where construction of the projects would be unable to avoid impacts on native vegetation and sensitive resources, such as wetlands, wetland buffer areas, riparian habitat, and other sensitive natural communities. The applicant would restore all temporarily impacted areas disturbed during construction of the projects, including staging areas and pull, tension, and splicing sites, to as close to pre-construction conditions as possible, or to the conditions agreed upon between the applicant and landowner. Replanting and reseeding would be conducted under the direction the applicant or contract biologists. If revegetation would occur on private property, revegetation conditions would be part of the agreement between the applicant and the landowner.
Project Commitment E	**Grading Plan.** SCE shall consult with Riverside County regarding the grading plans for construction and operation of the proposed projects. Storm water improvements shall be designed to maintain a discharge of storm water runoff consistent with the characteristics of storm water runoff presently discharged from project areas including the Alberhill Substation site. Measures included in the plans shall minimize adverse effects on existing or planned storm water drainage systems. Ground surface improvements installed at the site pursuant to the plans shall be designed to minimize discharge of materials that would contribute to a violation of water quality standards or waste discharge requirements. The final grading design shall include features that would minimize erosion and siltation both onsite and offsite. In addition, the final grading (and drainage) design shall be based on the results of the geotechnical study and soil evaluation for the substation site (Project Commitment F).
Project Commitment F	**Geotechnical Study, Soil Testing, and Seismic Design Standards.** Prior to the start of construction, the applicant shall conduct geotechnical and hydrologic studies and field investigations of the Alberhill Substation site, 500-kV transmission line routes, all 115-kV subtransmission line routes, and all telecommunications line routes. The studies shall include an evaluation of the depth to the water table, liquefaction potential, physical properties of subsurface soils, soil resistivity, and slope stability (landslide susceptibility). The studies shall include soil boring and laboratory testing to determine the engineering properties of soils, characterize soils and underlying bedrock units, characterize groundwater conditions, and evaluate faulting and seismicity risk. Soil samples shall be collected and analyzed for common contaminants and the presence of hazardous materials, if indicated by the Phase 1 results. If chemicals are detected in the soil samples at concentrations above acceptable threshold levels, the applicant shall avoid the above threshold soil or work with the property owner to remove the above threshold soil. The results of this study shall be applied to final engineering designs for the projects. The information collected shall be used to determine final tubular steel pole foundation designs. In addition, the applicant shall design Alberhill Substation consistent with the applicable federal, state, and local codes, including the Institute of Electrical and Electronic Engineers 693 Standard, *Recommended Practices for Seismic Design of Substations*.

Project Commitment G	**Aircraft Flight Path Safety Provisions and Consultations.** Prior to construction, the applicant shall consult with the Federal Aviation Administration and ensure the filing of forms and associated specifications per the requirements of Federal Aviation Regulations Part 77 (Objects Affecting Navigable Airspace). The applicant shall review all recommendations and/or determinations from the FAA and mark and/or light the FAA recommended components where the applicant finds they are reasonable and feasible.
Project Commitment H	**Noise Control and Notification.** The applicant shall implement the following noise control measures for the proposed projects: • All construction and general maintenance activities, except in an emergency or within enclosed structures which reduce the noise to less than significant, shall be limited to the hours of 7 a.m. to 7 p.m. and prohibited on Sundays and ~~all legally proclaimed~~ holidays recognized by the~~. SCE will obtain all relevant ministerial or non-discretionary noise permits from~~ local jurisdictions. In the event that construction activities are necessary on days or hours outside of what is specified by the local ordinance, SCE would provide advance ~~five-day advanced~~ notification, including a general description of the work to be performed, location and hours of construction anticipated, to the CPUC, the local jurisdiction, and residents within 300 feet of the anticipated work, as well route all construction traffic away from residences, schools and recreational facilities to the extent feasible. • Construction equipment shall use noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. • Construction traffic shall be routed away from residences and schools, where feasible. • Unnecessary construction vehicle use and idling time shall be minimized to the extent feasible. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. A "common sense" approach to vehicle use shall be applied: if a vehicle is not required for use immediately or continuously for construction activities, its engine should be shut off. Note: certain equipment, such as large diesel-powered vehicles require extended idling for warm-up and repetitive construction tasks. • The applicant will notify all receptors within 300~~500~~ feet of construction of the potential to experience significant noise levels during construction. • During construction, the applicant will use a temporary noise barrier ~~that blocks the line of sight~~ between the construction area and the residence in areas where sensitive receptors would be subjected to significant noise impacts. • The applicant would shield small stationary equipment with portable barriers within 100 feet of residences, where feasible. • The applicant would minimize engine idling and turn off engines when not in use. • ~~Where blasting is required for the Alberhill system Project, the applicant would conduct additional pre- blast notification and coordination with residents, utilities, and others that may be affected by blasting operations.~~
Project Commitment I	**Agricultural Uses.** Existing agricultural and grazing uses within the existing and proposed ROW areas shall be allowed to continue during operation of the proposed projects. In addition, the applicant shall coordinate construction and maintenance activities with agricultural landowners to avoid interference with grazing and agricultural activities unless such coordination is not possible due to emergency circumstances.

Project Commitment J	**Air Emissions Controls.** ~~The applicant would implement the following fugitive dust control measures for the Valley–Ivyglen Subtransmission Project:~~ • ~~Water three times per day or as needed during excavation, bulldozing, scraping, and grading activities, in order to ensure compliance with SCAQMD Rule 403, Fugitive Dust.~~ • ~~Water storage piles twice a day, resulting in a 50% fugitive dust control efficiency.~~ • ~~Limit vehicle speeds on unpaved roads to 15 miles per hour, per SCAQMD's Table XI-A, Mitigation~~ The applicant would implement the following fugitive dust control measures for the Alberhill System Project: • Water three times per day or as needed during excavation, bulldozing, scraping, and grading activities, in order to ensure compliance with SCAQMD Rule 403, Fugitive Dust. • Water storage piles twice a day, resulting in a 50% fugitive dust control efficiency. • Limit vehicle speeds on unpaved roads to 15 miles per hour, per SCAQMD's Table XI-A, Mitigation Measure Examples; Fugitive Dust from Construction and Demolition (Rev. 4/2007).

Sources: SCE 2011, 2014

2.7 PERMITTING AND CONSULTATION REQUIREMENTS

Table 2-13 lists the federal, state, and local permits and consultations that may be required for construction and operation of the proposed projects.

Table 2-~~1413~~13 Consultation and Permitting Requirements

Agency/Group	Jurisdiction	Consultation or Permit
Federal		
United States Army Corps of Engineers	Work within Waters of the United States including wetlands	Consultation with the USACE for a Clean Water Act Section 404 Nationwide Permit Authorization
United States Fish and Wildlife Service	Federally listed threatened or endangered species impacts	Take authorization (if required) and consultation with the USFWS. Consultation for Section 7 or 10 of the Federal Endangered Species Act.
United States Forest Service	United States National Forest System land	Permission to install communications equipment (i.e., two new microwave dish antennas) on an existing communications tower at the Santiago Peak Communications Site. Thirty-day Technical Data Form notice to be sent to all leaseholders at the Santiago Peak Communications Site. A United States Forest Service representative for the Cleveland National Forest confirmed that no environmental review pursuant to the National Environmental Policy Act would be required for the installation of two microwave dish antennas on an existing communications tower at the communication site (Taylor 2012).
Federal Aviation Administration	Aircraft operation and safety in United States air space	Consultation to determine whether Congested Area Plan approval for helicopter external-load operations is required. Consultation to ensure compliance with Federal Aviation Regulations Part 77 (Objects Affecting Navigable Airspace).

Agency/Group	Jurisdiction	Consultation or Permit
State		
California Department of Fish and Wildlife	State listed threatened or endangered species impacts. Work in Waters of the State.	Take authorization (if required) and consultation with the CDFW Consultation for Section 2081 of the California Endangered Species Act. Consultation is anticipated to be completed as part of the Participating Special Entity (PSE) application process to obtain "take" coverage under the WRCMSHCP. Consultation for Section 1600 of the Fish and Game Code (streambed alteration agreement).
California Department of Transportation	Acts on behalf of the U.S. Department of Transportation pursuant to California Streets and Highways Code 660 to 711.21 and California Code of Regulations 1411.1 to 1411.6.	Caltrans requires that all work done within or spanning a state or interstate highway ROW receives an encroachment permit. Permit required for oversize and/or overweight truck loads that exceed the limits of a legal load as defined by the California Vehicle Code.
State ~~Santa Ana Regional~~ Water Resources Control Board	National Pollutant Discharge Elimination System coverage and Clean Water Act Section 401 oversight	All required Permit Registration Documents (PRDs for Construction General Permit (CGP) for Storm Water Discharge. Section 401 Water Quality Certification.
State Historic Preservation Office, Native American Heritage Commission	Historic, cultural, and archaeological resources	Consultation for Section 106 of the National Historic Preservation Act may be required. Consultation regarding known cultural resources. Consultation regarding the listing of cultural or historic resources in the National Register of Historic Places or California Register of Historical Resources. Cultural Resources Use Permit, Field Use Authorization, or Archeological Resources Protection Act Permit (as required) for land disturbance in culturally sensitive areas.
Regional and Local		
Elsinore Valley Municipal Water District	Public water pipelines	Permit and consultation to relocate water pipeline at proposed substation site. The pipeline is owned and operated by EVMWD.
South Coast Air Quality Management District	Air pollution and greenhouse gas emissions including fugitive dust	The stationary diesel generator at the proposed substation may require a SCAQMD permit. Rule 403 Permit for fugitive dust. Notification of demolition and asbestos removal (Rule 1403) for demolition of structures at horse ranch.
Riverside County Habitat Conservation Agency	Threatened or endangered species (including the Stephen's kangaroo rat), and conservation plans	Consultation with RCHCA to determine "take" permit (Federal and State Endangered Species Acts) and mitigation requirements for proposed project areas in Riverside County that would cross core habitat reserves and other areas covered by a Habitat Conservation Plan.
Western Riverside County Regional Conservation Authority	Western Riverside County Multiple Species Habitat Conservation Plan	Consultation with the Western Riverside County RCA to determine permit and mitigation requirements for proposed project areas

Agency/Group	Jurisdiction	Consultation or Permit
Riverside County	Protected trees, aqueduct crossings, and grading in unincorporated Riverside County	Permits required for tree removal (e.g., mature trees and oak woodlands). The grading permit would incorporate requirements from the Spill Prevention, Control, and Countermeasure Plan because of the oil-filled transformers at the substation (Codified Federal Regulations Part 112.1–112.7).
Riverside County Department of Building and Safety	All buildings constructed or demolished in unincorporated Riverside County	~~Permit required for construction of the proposed substation and to erect steel.~~ Demolition permit required for removal of the existing horse ranch facilities on the proposed substation site including an asbestos clearance permit. Permit required for design of the perimeter wall to ensure consistency with the surrounding community.
Riverside County Department of Environmental Health	Installation of wastewater treatment systems, abandonment and abatement of septic systems, and destruction of water wells	Septic system installation permit required for the new septic system at proposed substation site. Closure permit required for the abandonment and abatement of existing septic systems. Permit required for the destruction of onsite water well.
Riverside County Transportation Department	Encroachment on railroad, road crossings, and other public ROWs (including excavation along ROWs)	Encroachment permit
Riverside County Flood Control and Water Conservation District	Flood control and water conservation in the district; Sedco and Wildomar Master Drainage Plan boundaries	Encroachment permit
Cities of Lake Elsinore, Menifee, Perris, and Wildomar (ministerial)	Construction activities in public ROW or easements, tree protection, and grading within the city limits	Encroachment permits, tree removal permits, and grading permits
Santa Ana Regional Water Control Board	National Pollutant Discharge Elimination System coverage, Construction Dewatering oversight	Oversight for the Construction General (CGP) for Storm Water Discharge. Dewatering permitting consultation.
Riverside County Municipal Separate Storm Sewer System (MS4)	Post-Construction Requirements for Storm Water	Consultation for Post-Construction Requirements.

Source: SCE 2011

Key: Caltrans = California Department of Transportation, CDFW = California Department of Fish and Wildlife, CEQA = California Environmental Quality Act, EVMWD = Elsinore Valley Municipal Water District, kV = kilovolt, RCA = Regional Conservation Authority, RCHCA = Riverside County Habitat Conservation Agency, ROW = right-of-way, RWQCB = Regional Water Quality Control Board, SCAQMD = South Coast Air Quality Management District, SWPPP = Storm Water Pollution Prevention Plan, USACE = U.S. Army Corps of Engineers, USFWS = U.S. Fish and Wildlife Service

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APPENDIX N: PROJECT DESIGN COMPARISON

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INTRODUCTION

This appendix summarizes the technical design modification and additional engineering refinements that have been made to the Alberhill System Project (Proposed Project or ASP) since the time of the original ASP (i.e., the project design documented in the Final Environmental Impact Report [FEIR] published in 2017 or Original Project). As described in Appendix M: Revised Project Description, the principal design modification involves converting the 500 kilovolt (kV) switchrack at the proposed Alberhill Substation from a gas-insulated switchgear (GIS) design to an air-insulated switchgear (AIS) design to reduce greenhouse gas emissions and costs. Other refinements are primarily to recognize the completion of the Valley-Ivyglen Project and other recent small-scale subtransmission system changes in the Proposed Project area and to leverage this existing infrastructure to simplify and reduce the impacts of the Proposed Project. Work areas and staging yards have also been slightly modified to accommodate these changes and other local development activities that have occurred over recent years. Finally, the use of helicopter construction methods has been more well defined, which will eliminate the need to construct certain access roads, thereby reducing temporary and permanent impacts associated with constructing those roads.

Organized by Proposed Project component, Table N-1: Proposed Project Change Log provides a brief description of each change, identifying the reason for each change, and indicates the map page where the change is depicted on Figure N-1: Detailed Comparison Map. Figure N-1: Detailed Comparison Map depicts the changes that have been incorporated into the Proposed Project design and the resulting changes to the anticipated temporary and permanent impacts.

Table N-1: Proposed Project Change Log

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
Alberhill Substation				
1	500 Kilovolt (kV) Switchgear	Replaces the original gas-insulated switchgear (GIS) design with an air-insulated switchgear (AIS) design.	The change is largely driven by California Air Resources Board (CARB) regulations effective January 2022 mandating the phase-out of sulfur hexafluoride (SF_6) in substation equipment. In addition, the use of AIS reduces Proposed Project costs.	3
2	500/115 kV Transformers	Reduces the number of future on-site transformers from four (up to three in service with one spare) to three (up to two in service with one spare).	Southern California Edison (SCE) has reevaluated the expected maximum load that will be served by the substation and has determined that three transformers (two initially installed with one future) are expected to be sufficient.	3
3	500 kV Capacitor Banks	Removes the space reserved for two future 500 kV capacitor banks.	The change to an AIS design requires a larger footprint for the 500 kV switchrack. To accommodate the larger switchrack footprint while maintaining the Original Project's substation area, SCE reviewed the originally proposed scope elements and opted to remove the 500 kV capacitor banks from the Proposed Project.	3
4	12 kV Switchrack and 115/12 kV Transformers	Removes the space reserved for future 12 kV switchrack and 115/12 kV transformers.	The change to an AIS design requires a larger footprint for the 500 kV switchrack. To accommodate the larger switchrack footprint while maintaining the Original Project's substation area, SCE reviewed the originally proposed scope elements and opted to remove the 12 kV switchrack and 115/12 kV transformers from the Proposed Project.	3

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
5	Future 115 kV Capacitor Banks	Removes the space reserved for two future 115 kV capacitor banks. Retains one capacitor bank for initial construction, and reserves space for one future capacitor bank.	The change to an AIS design requires a larger footprint for the 500 kV switchrack. To accommodate the larger switchrack footprint while maintaining the Original Project's substation area, SCE reviewed the originally proposed scope elements and opted to remove two future 115 kV capacitor banks from the Proposed Project.	3
6	Substation General Arrangement and Plot Plan	Adjusts the substation arrangement and plot plan to accommodate the previously described changes to the substation.	The change in 500 kV switchrack design necessitated the reconfiguration of surrounding substation equipment.	3
500 kV Transmission Lines				
7	Tower SA1	Relocates the tower to the northeast.	The change in 500 kV switchrack design necessitated the relocation of this tower to accommodate line angle requirements for conductor termination on the 500 kV switchrack.	3
8	Tower SA2	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the Final Environmental Impact Report (FEIR) will be constructed.[1] Eliminates helicopter use for tower construction at this site.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	3

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
9	Tower SA3	Defines the use of helicopter construction methods at this location; therefore, a new permanent access road to this tower location as defined in the FEIR is not required. Requires a new permanent helicopter landing pad to facilitate construction using helicopter methods.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2
10	Tower SA4	Defines the use of helicopter construction methods at this location; therefore, a new permanent access road to this tower location as defined in the FEIR is not required. Requires a new permanent helicopter landing pad to facilitate construction using helicopter methods.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2
11	Tower SA5	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the FEIR will be constructed.[1] Eliminates helicopter use for tower construction at this site.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2
12	Tower SA6	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the FEIR will be constructed.[1]	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	1, 2
13	Tower VA1	Relocates the tower to the northeast.	The change in 500 kV switchrack design necessitated the relocation of this tower to accommodate line angle requirements for conductor termination on the 500 kV switchrack.	3

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
14	Tower VA2	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the FEIR will be constructed.[1] Eliminates helicopter use for tower construction at this site.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	3
15	Tower VA3	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the FEIR will be constructed.[1] Eliminates helicopter use for tower construction at this site.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2
16	Tower VA4	Defines the use of helicopter construction methods at this location; therefore, a new permanent access road to this tower location as defined in the FEIR is not required. Requires a new permanent helicopter landing pad to facilitate construction using helicopter methods.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2
17	Tower VA5	Defines the use of conventional construction methods at this location; therefore, new permanent access to this tower location as defined in the FEIR will be constructed. Eliminates helicopter use for tower construction at this site.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	2

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
18	Tower VA6	Defines the use of conventional construction methods at this location. Removes construction of new permanent access to this tower location.	Engineering has progressed; therefore, the anticipated construction methods and required access are more well defined.	1, 2
115 kV Subtransmission Lines				
19	All 115 kV Segments	Includes various minor modifications to structure type, structure location, and workspace requirements.	Minor modifications have been made to the Proposed Project design for various reasons including: • Engineering has progressed; therefore, the specific construction details have been updated accordingly, and • Work has been recently performed on the 115 kV subtransmission system in the Proposed Project vicinity as part of the recently completed Valley-Ivyglen (VIG) Project and other operations and maintenance (O&M) activities performed by SCE within the alignment that are independent of the Proposed Project, but still impact the Proposed Project design. These modifications include minor shifts in structure locations, workspace location and dimensions, and structure type (e.g., tubular steel pole [TSP] instead of lightweight steel [LWS] pole).	Varies
20	115 kV Segment ASP1.5	Removes existing pole 4765517E and includes a new TSP (Nearest 4765517E) in the vicinity.	A new TSP is required in this location to accommodate changes in the line angle associated with installing new ASP circuits along the as-built VIG Project alignment.	4
21	115 kV Segment ASP2	Adjusts ASP2's I-15 crossing point further to the east.	An adjustment to ASP2's alignment has been made to match the current alignment of the as-built VIG Project consistent with the Original Project.	4

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
22	115 kV Segment ASP2	Includes new TSP (4765494EX).	A new TSP is required in this location to accommodate changes in the line angle associated with installing new ASP circuits along the as-built VIG Project alignment.	4
23	115 kV Segment ASP2	Adjusts ASP2's crossing of Lake Street further south.	An adjustment to ASP2's alignment has been made to match the current alignment of the as-built VIG Project consistent with the Original Project.	5
24	115 kV Segment ASP2	Adjusts ASP2's alignment to match the West of Lake Street option for the VIG Project.	The West of Lake Street option was selected for the VIG Project; therefore, ASP2's alignment has been adjusted to match the VIG Project's as-built alignment consistent with the Original Project.	7
25	115 kV Segment ASP2	Utilizes existing conduit and vaults installed as part of the VIG Project to convert an approximately 0.75-mile portion of ASP2 from an overhead to underground configuration along Pasadena Street and 3rd Street.	The VIG Project design was modified following the FEIR to include underground construction in this location. During the VIG Project, additional empty conduit was installed within the duct banks for potential future use. This change avoids the construction of multiple new subtransmission poles in this location and reduces construction costs.	12, 13
26	115 kV Segment ASP2	Includes approximately 300 feet of new underground conduit between the end of the VIG Project's existing conduit and a newly included riser TSP (Nearest 4106806E).	The existing underground conduit installed as part of the VIG Project terminates at an existing riser TSP (4765336E). This additional segment of new underground construction will connect the conduit installed as part of the VIG Project to a new riser TSP that has been added to the Proposed Project design to allow the Alberhill-Skylark 115 kV circuit to rise above ground on the southwest side of Collier Avenue. Utilizing the optimized new riser TSP (Nearest 4106806E) instead of the existing riser TSP (4765336E) will eliminate between 200 and 350 feet of new overhead conductor across Collier Avenue.[2]	13

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
27	115 kV Segment ASP5	Eliminates the installation of two new TSPs at the I-15 crossing. Adds removal of existing wood pole (2302678E) and construction of new TSP (Nearest 2302678E). Eliminates the need to replace an existing wood pole (4286797E) with a new TSP.	In the Original Project, the 115 kV alignment near the intersection of Lemon Street and Almond Street (near the I-15 overpass) crossed to the north side of Lemon Street, turned east along the north side of the Lemon Street, and then crossed to the south side of Lemon Street after spanning I-15.[2] Three new TSPs were required along Lemon Street to replace existing wood poles, which would be removed. SCE recently installed two new TSPs (4627023E and 4627022E) on the south side of Lemon Street at the I-15 crossing as part of a separate O&M activity. SCE will use these existing TSPs to support the ASP 115 kV circuits, thereby eliminating the need to remove two existing poles at the I-15 crossing and install two of the TSPs included in the Original Project. Further, SCE will install the remaining TSP included in the Original Project at the southwest corner of Lemon and Almond Streets, which will eliminate an overhead crossing of Lemon Street.	23
28	115 kV Segment ASP6	Specifies TSPs (UNK-608 and UNK-609) rather than two guyed LWS poles at the east-west crossing of Murrieta Road. Shifts the location of new TSP UNK-608 to the north on the east side of Murrieta Road, and shifts new TSP UNK-609 on the west side of Murrieta Road to north side of the intersection of Waldon Road and Murrieta Road.	SCE's current practice is to use TSPs for locations where structures require additional support due to near-perpendicular line angles. Shifting the TSP locations will reduce potential impacts within the landscaped portion of a surrounding residential property.[2]	29

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
29	115 kV Segment ASP6	Shifts the location of multiple new poles (UNK-686 through UNK-696) east.	Adjustments made along Murrieta Road between La Piedra Road/Mountain Park Drive and Murphy Ranch Road/Puerta Valarta Way account for the recent realignment of Murietta Road.[2]	35
30	115 kV Segment ASP8	Converts the 115 kV circuit in ASP8 from an overhead to underground configuration. Changes the point of crossing between the 115 kV circuit and the 500 kV circuit from the east side to the west side of Lattice Steel Tower M3-T1.	In this location, the 115 kV circuit will cross under the existing overhead Serrano-Valley 500 kV Transmission Line. Utilizing an underground configuration for the 115 kV circuit will eliminate potential clearance issues between the 115 kV circuit and the existing overhead 500 kV transmission line. The crossing point is shifted to the west side of existing Lattice Steel Tower M3-T1 to accommodate the as-built VIG Project pole locations.	37
Additional Substation Modifications				
31	Valley Substation	Removes existing equipment, installs new conductor to replace the removed equipment, and installs relays and telecommunications equipment. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	N/A
32	Newcomb Substation	Requires a new 115 kV circuit breaker, dead-end structure, and associated equipment and connections to be installed. Requires existing relays to be replaced and additional telecommunications system upgrades. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	36

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
33	Skylark Substation	Requires the termination of new 115 kV circuits at existing rack positions. Requires existing relays and switches to be replaced and additional telecommunications system upgrades. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	21
34	Ivyglen Substation	Requires relays and associated telecommunication circuit upgrades. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	N/A
35	Tenaja Substation	Requires relays and associated telecommunication circuit upgrades. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	N/A
36	Fogarty Substation	Requires relays and associated telecommunication circuit upgrades and the installation of a new telecommunications rack. All work will be conducted within the existing substation fence line.	This scope of work was not included in the FEIR and is required to complete the Proposed Project.	N/A
Staging Areas				
37	Staging Area ASP8	Removes Staging Area ASP8.	Development by a third party within a portion of this property has been initiated. Due to uncertainty about its availability, SCE has removed this staging area from the Proposed Project.	17
38	Staging Area ASP11 (Concordia)	Adds Staging Area ASP11 (Concordia).	This staging area has been added to provide an additional staging option should one or more other staging areas become unavailable.	3, 4

Change ID	Changed Proposed Project Component/ Element	Description of Change	Reason(s) For Change	Change Location on Figure N-1 (Page[s])
39	Staging Area ASP12 (Chaney Yard)	Adds Staging Area ASP12 (Chaney Yard).	This staging area has been added to provide an additional staging option should one or more other staging areas become unavailable.	13
40	Staging Area ASP14 (ST-A5)	Adds Staging Area ASP14 (ST-A5).	This staging area has been added to provide an additional staging option should one or more other staging areas become unavailable.	27
41	Staging Area ASP15 (ST-A4)	Adds Staging Area ASP15 (ST-A4).	This staging area has been added to provide an additional staging option should one or more other staging areas become unavailable.	28

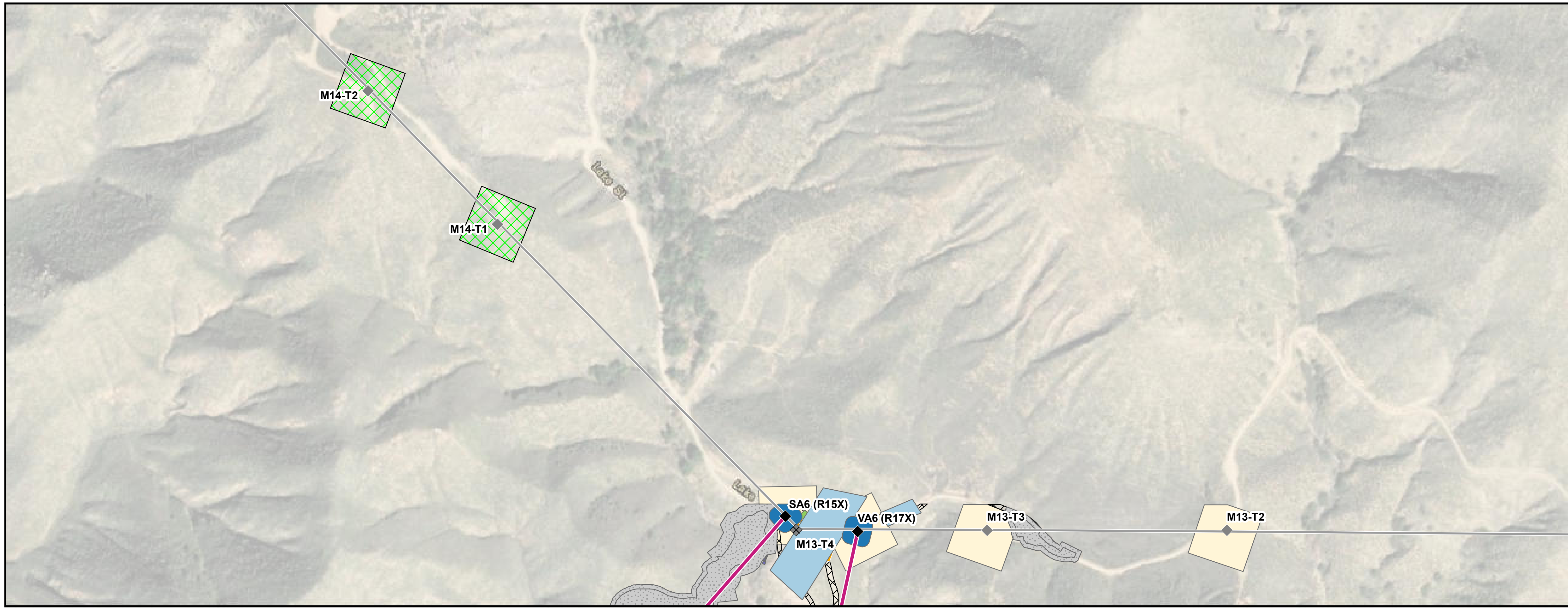
Note:

1 Minor modifications have been made to the access road design that was included in the FEIR. These changes are depicted in Figure N-1: Detailed Comparison Map.

2 Figure N-1: Detailed Comparison Map depicts the 115 kV alignment as presented in the FEIR. In some locations, this alignment is not depicted as intersecting the corresponding structure locations.

Figure N-1: Project Comparison Map
1 of 39

Alberhill System Project



Proposed Project Design

- New 500 kV Tower
- Existing 500 kV Tower
- Remove 500 kV Tower
- Proposed Overhead 500 kV Transmission Line
- Existing Overhead Serrano-Valley 500 kV Transmission Line

Temporary

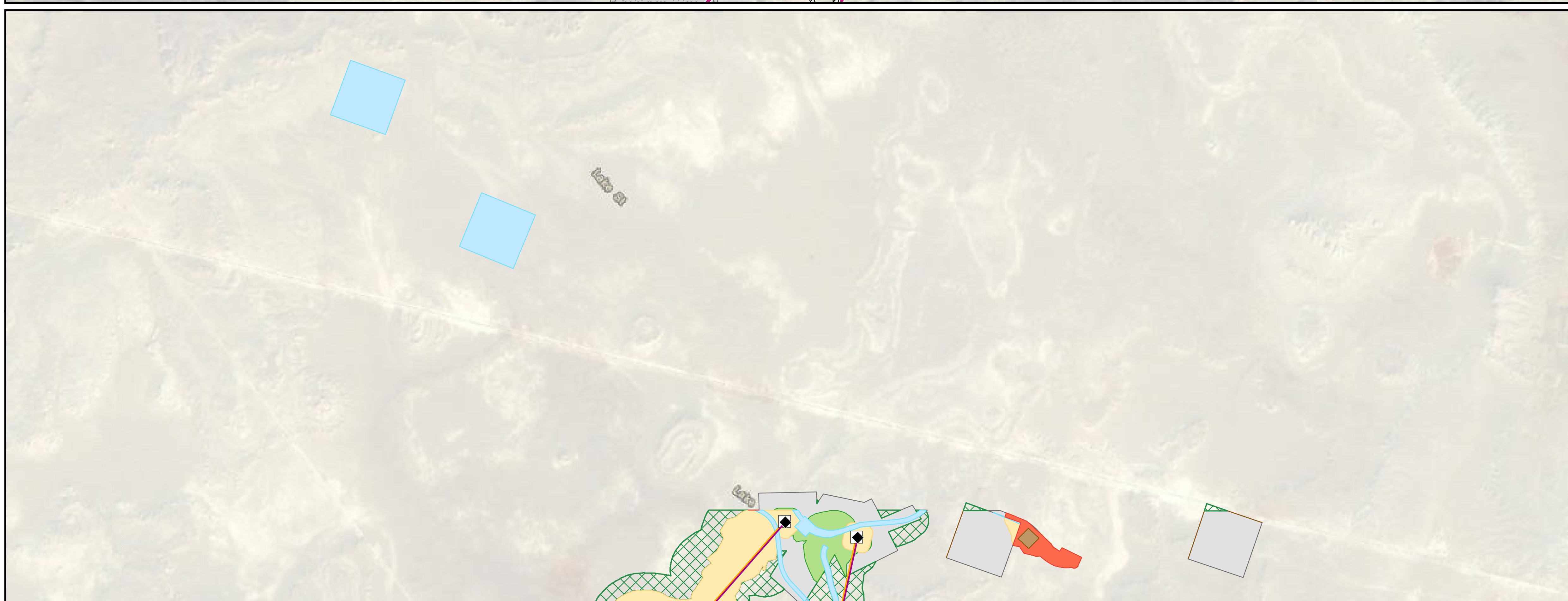
- Construction/Disturbance Area
- Structure Work Area
- Wire Setup
- Staging Area

Permanent

- O&M
- Grading Limit/Disturbance Area
- Mechanical Stabilization
- Erosion Control
- Access Road

No Impact

- Access Road
- Structure Work Area



FEIR Design vs Proposed Project Design

- Final New 500 kV Tower
- Final Proposed Overhead 500 kV Transmission Line
- FEIR New 500 kV Tower
- FEIR Proposed Overhead 500 kV Transmission Line
- New Permanent Impact
- New Temporary Impact
- No Change
- Permanent to Temporary
- Removed from Project
- Temporary to Permanent
- Temporary/Permanent to No Impact

SOUTHERN CALIFORNIA EDISON
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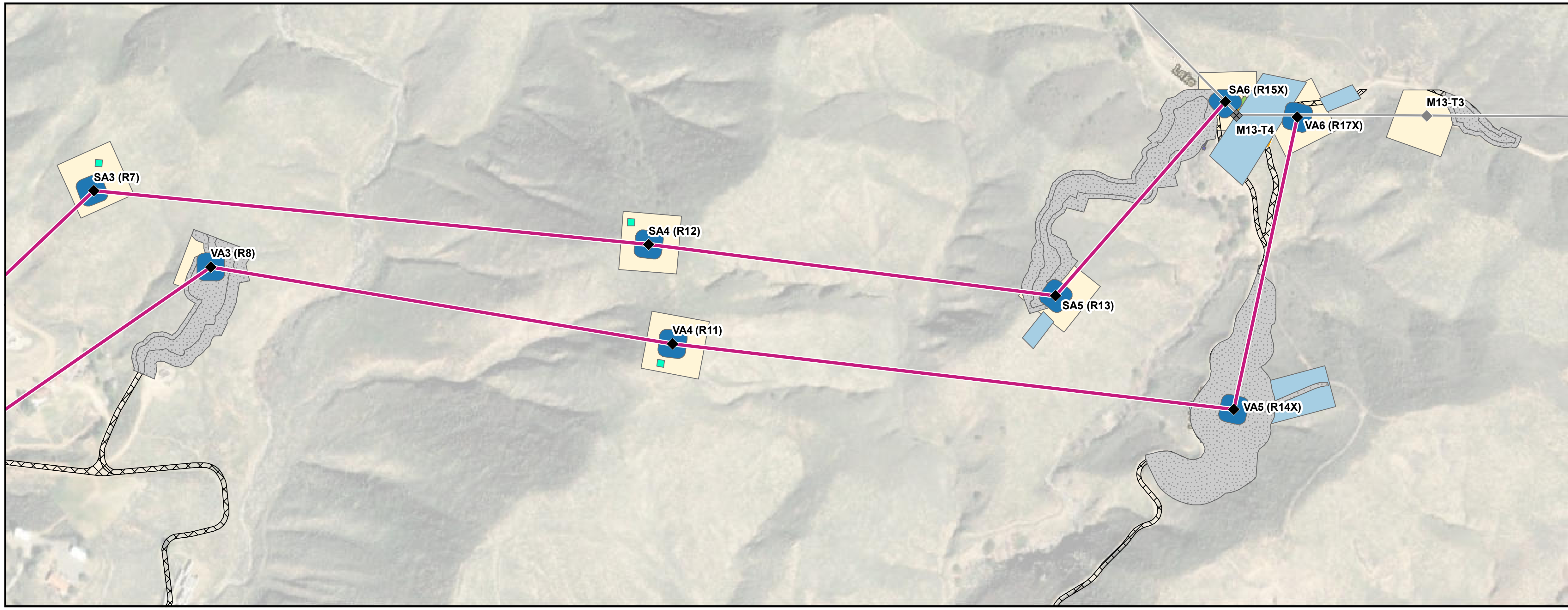
INSIGNIA ENVIRONMENTAL

N
0 200 400 Feet

Figure N-1:
Project Comparison Map

Alberhill System Project

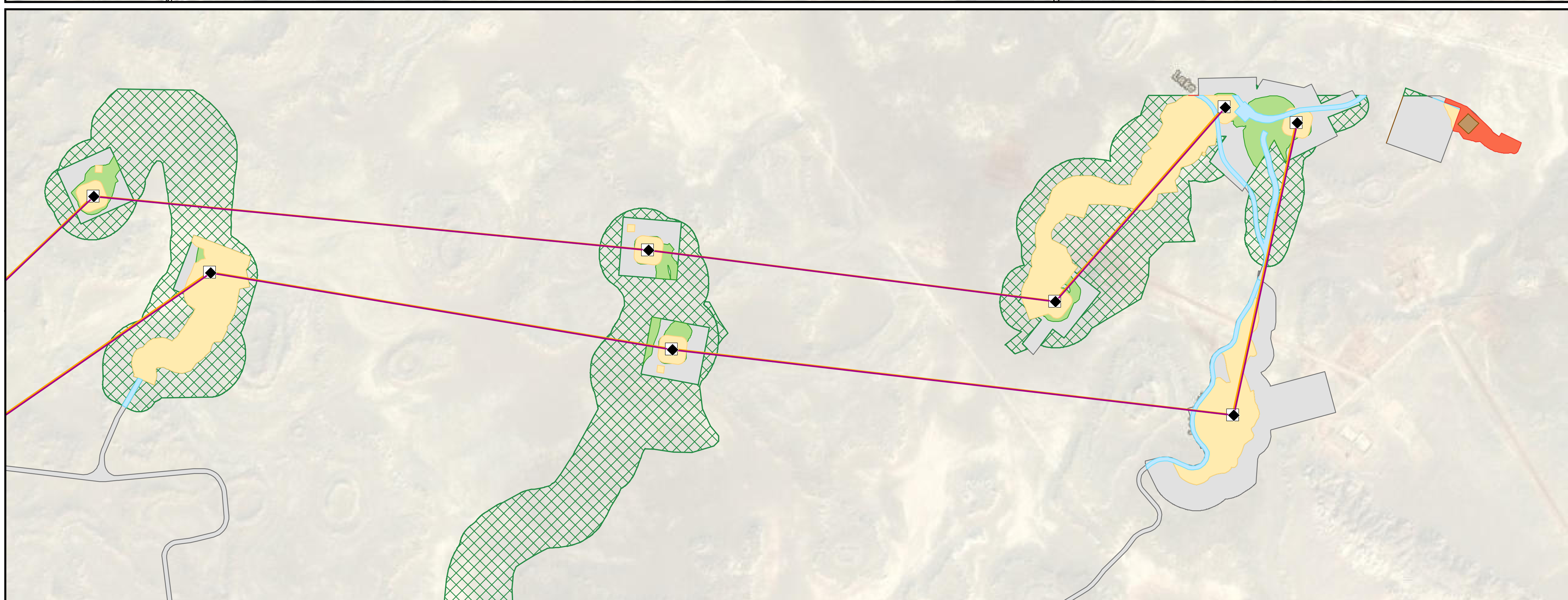


Proposed Project Design
- New 500 kV Tower
- Existing 500 kV Tower
- Remove 500 kV Tower
- Proposed Overhead 500 kV Transmission Line
- Existing Overhead Serrano-Valley 500 kV Transmission Line

Temporary
- Construction/Disturbance Area
- Structure Work Area
- Wire Setup
- Staging Area

Permanent
- O&M
- Helicopter Landing Platform
- Grading Limit/Disturbance Area
- Mechanical Stabilization
- Erosion Control
- Access Road

No Impact
- Access Road

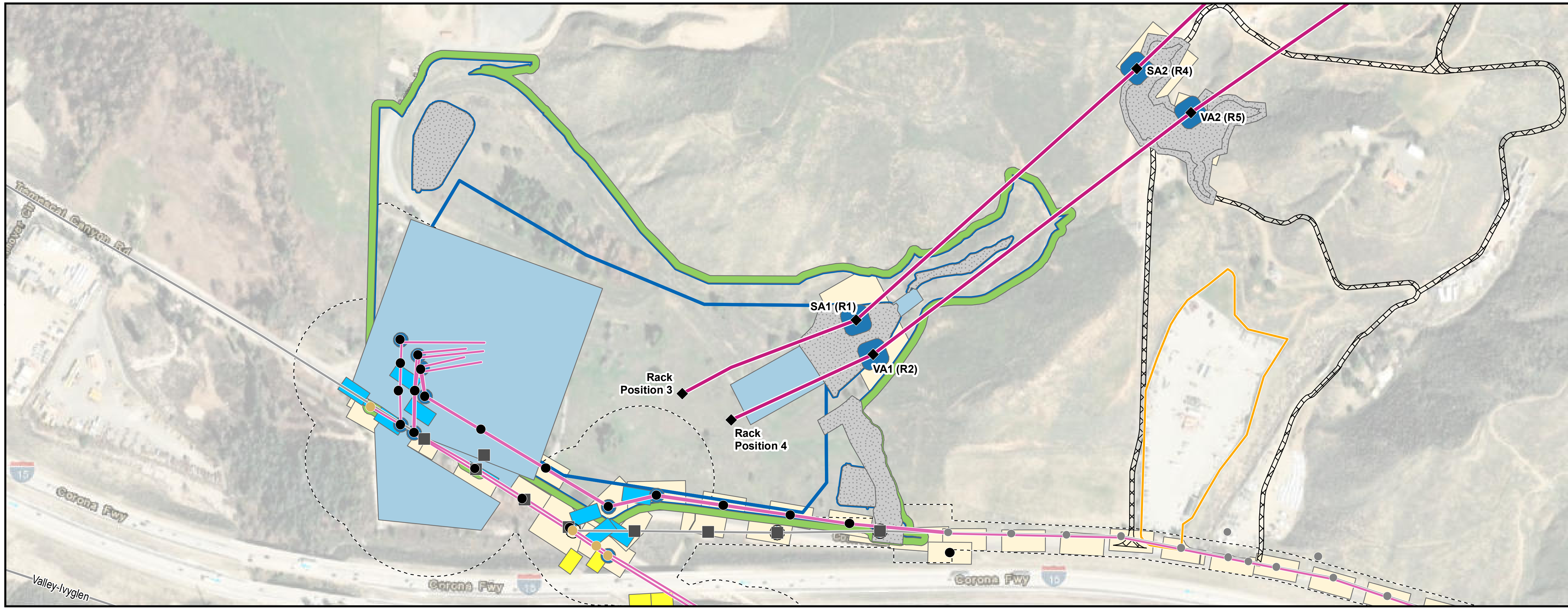


FEIR Design vs Proposed Project Design
- Final New 500 kV Tower
- Final Proposed Overhead 500 kV Transmission Line
- FEIR New 500 kV Tower
- FEIR Proposed Overhead 500 kV Transmission Line
- New Permanent Impact
- New Temporary Impact
- No Change
- Permanent to Temporary
- Removed from Project
- Temporary to Permanent
- Temporary/Permanent to No Impact

Feet 0 200 400

Figure N-1: Project Comparison Map
3 of 39

Alberhill System Project



Proposed Project Design

- New 500 kV Tower
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 500 kV Transmission Line
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

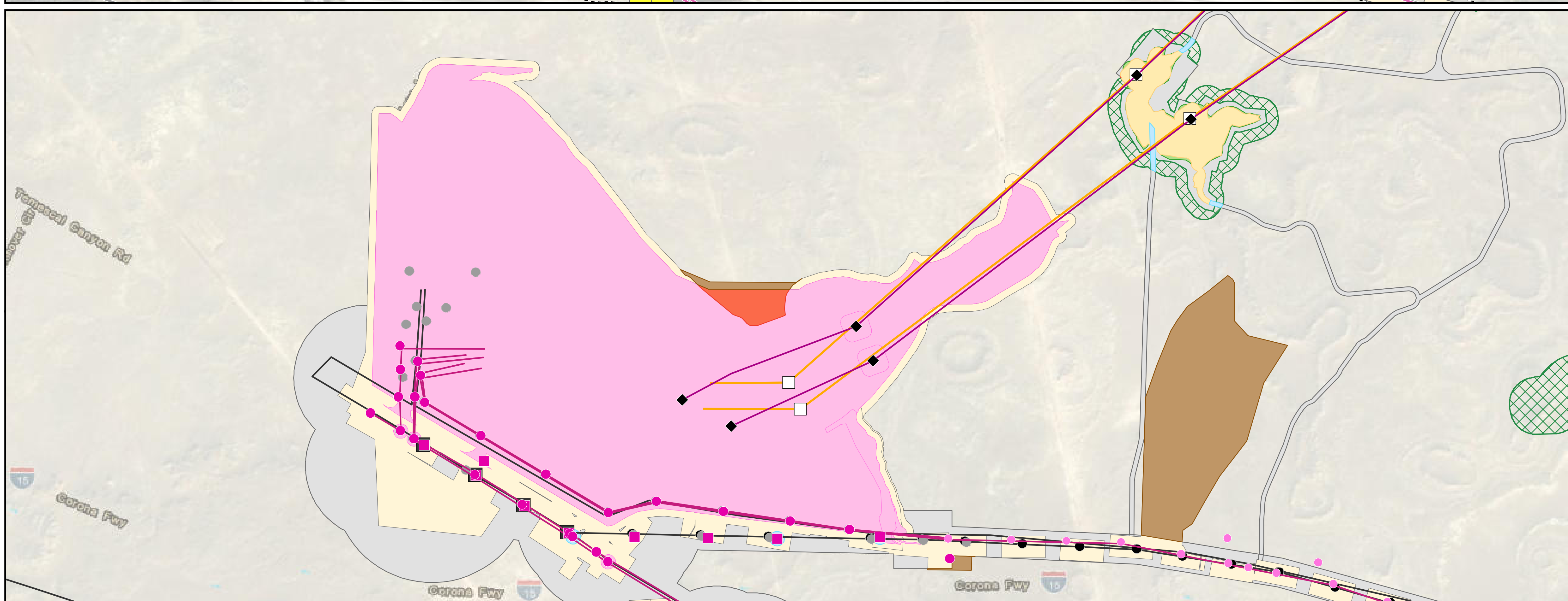
- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- Wire Setup
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M
- Grading Limit/Disturbance Area
- Fence/Substation
- Access Road

No Impact

- Access Road
- O&M



FEIR Design vs Proposed Project Design

- Final New 500 kV Tower
- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 500 kV Transmission Line
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR New 500 kV Tower
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 500 kV Transmission Line
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Permanent Impact
- New Temporary Impact
- No Change
- Permanent to Temporary
- Removed from Project
- Temporary to Permanent
- Temporary/Permanent to No Impact

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Figure N-1:
Project Comparison Map
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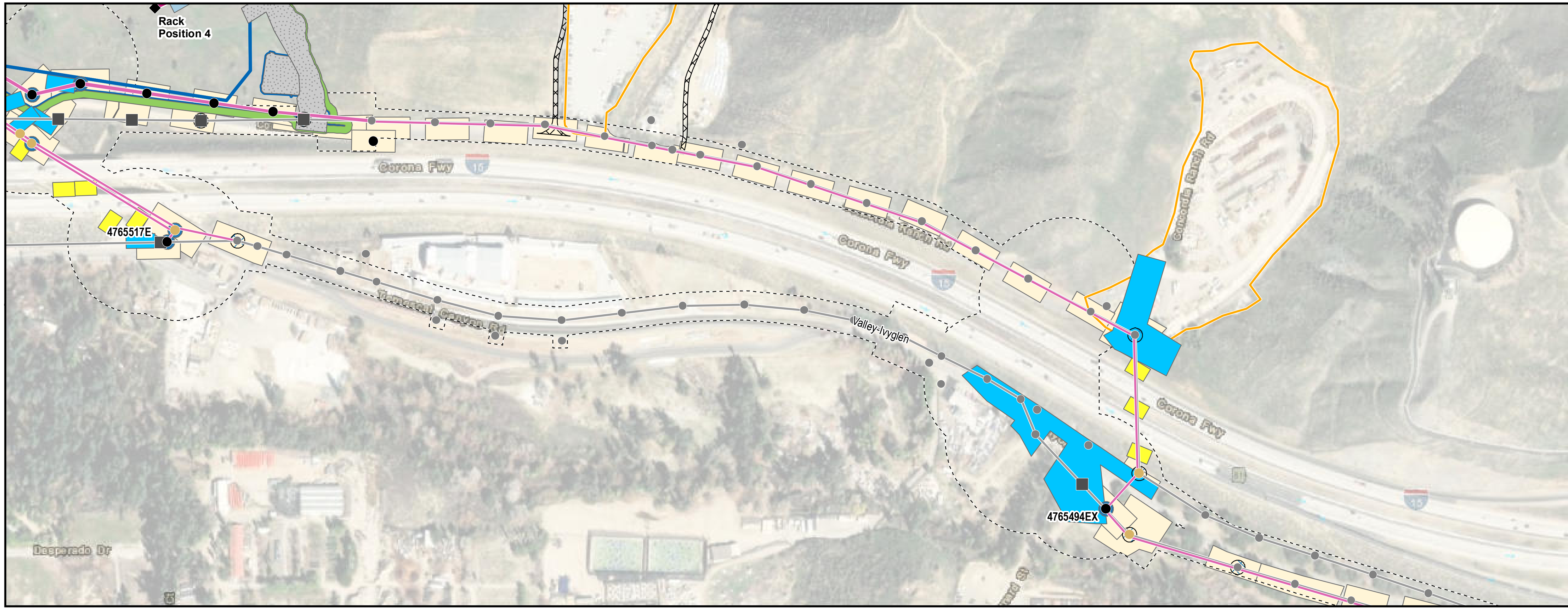
Alberhill System Project

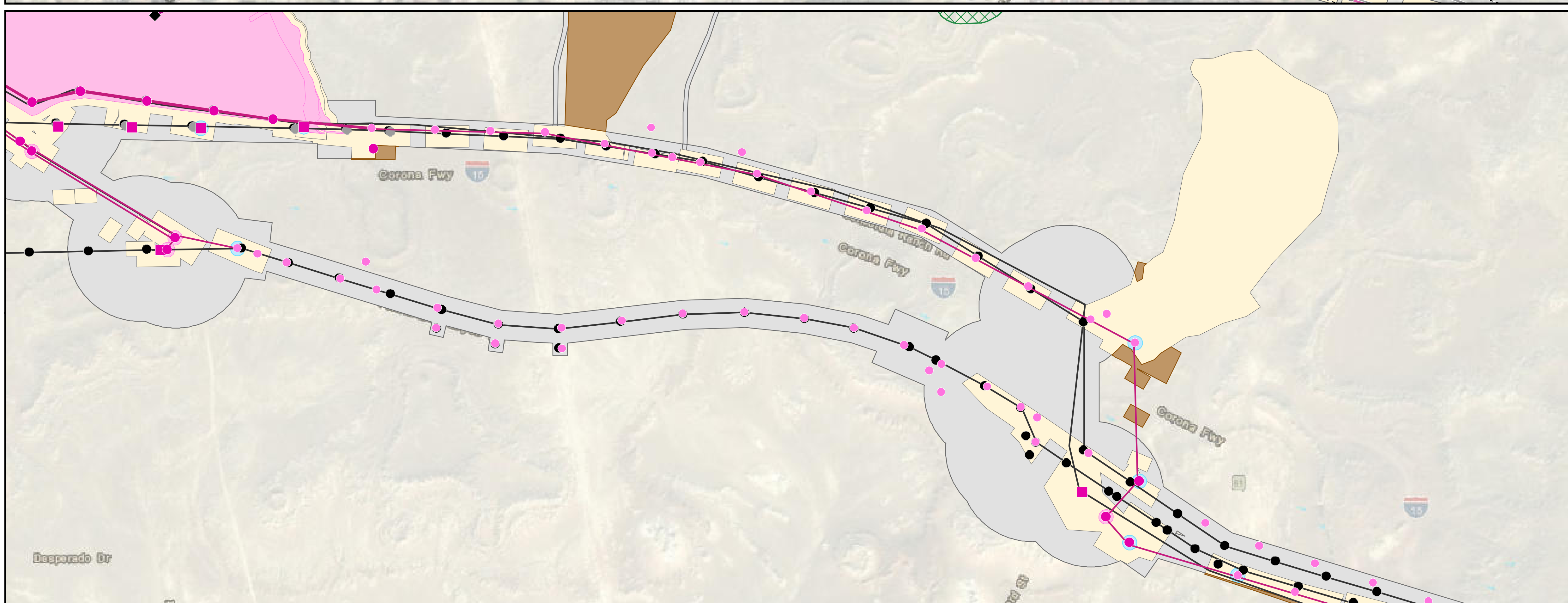


Proposed Project Design
- New 500 kV Tower
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 500 kV Transmission Line
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary
- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- Wire Setup
- Staging Area
- 115 kV General Disturbance Area

Permanent
- O&M
- Grading Limit/Disturbance Area
- Fence/Substation
- Access Road

No Impact
- Access Road
- O&M



FEIR Design vs Proposed Project Design
- Final New 500 kV Tower
- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 500 kV Transmission Line
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Removed from Project
- Temporary/Permament to No Impact

Feet
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Figure N-1: Project Comparison Map
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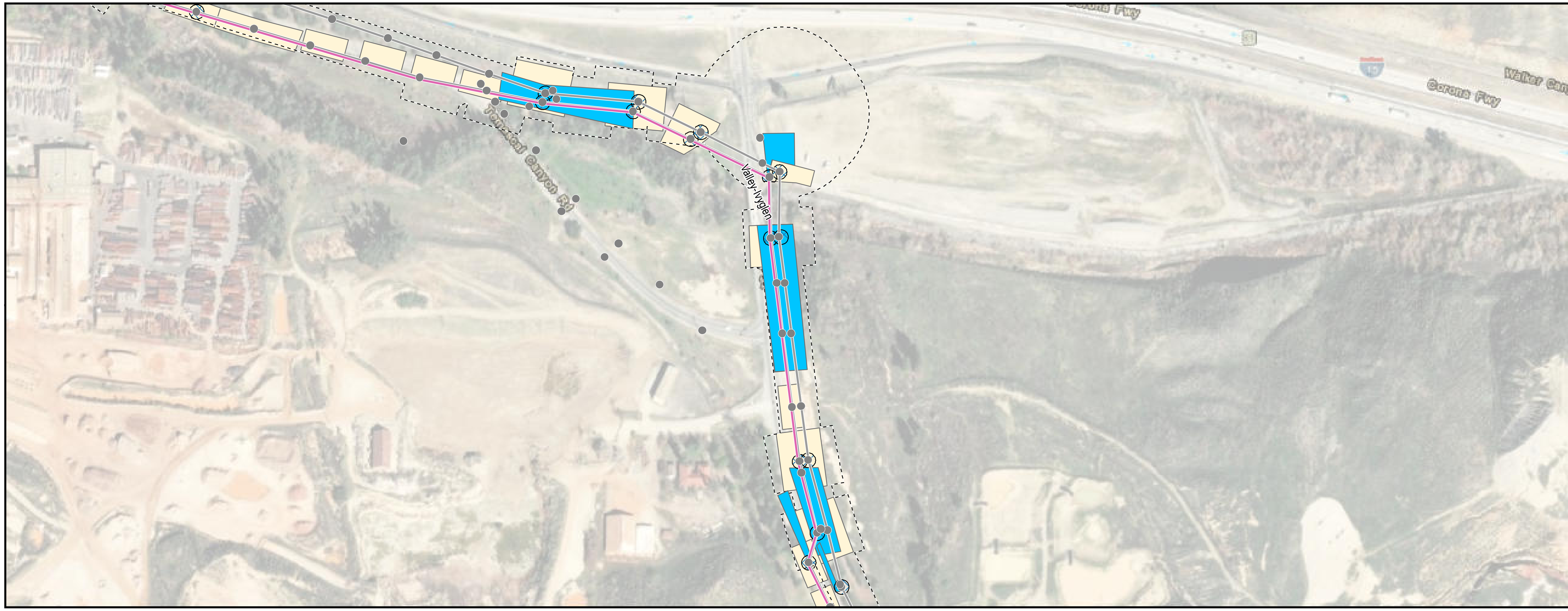
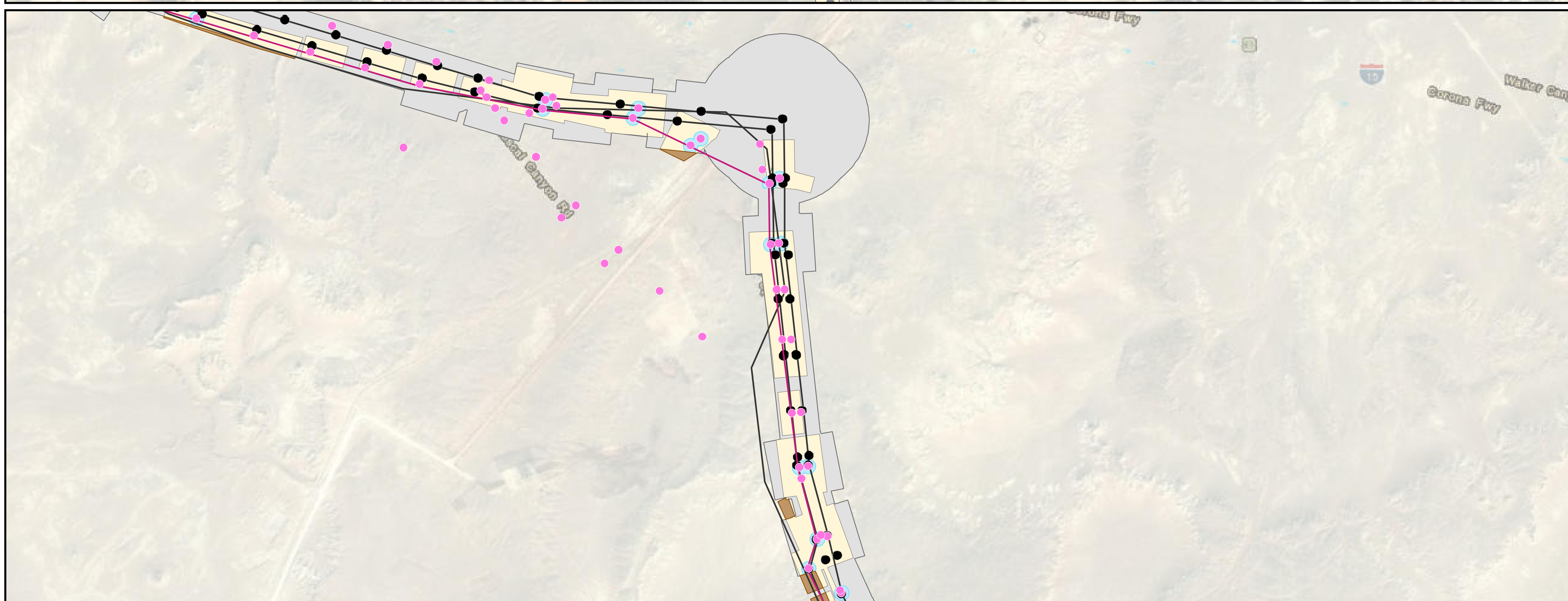
Alberhill System Project



Proposed Project Design
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact
- O&M



FEIR Design vs Proposed Project Design
- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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Feet
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Figure N-1:
Project Comparison Map

Alberhill System Project

Proposed Project Design

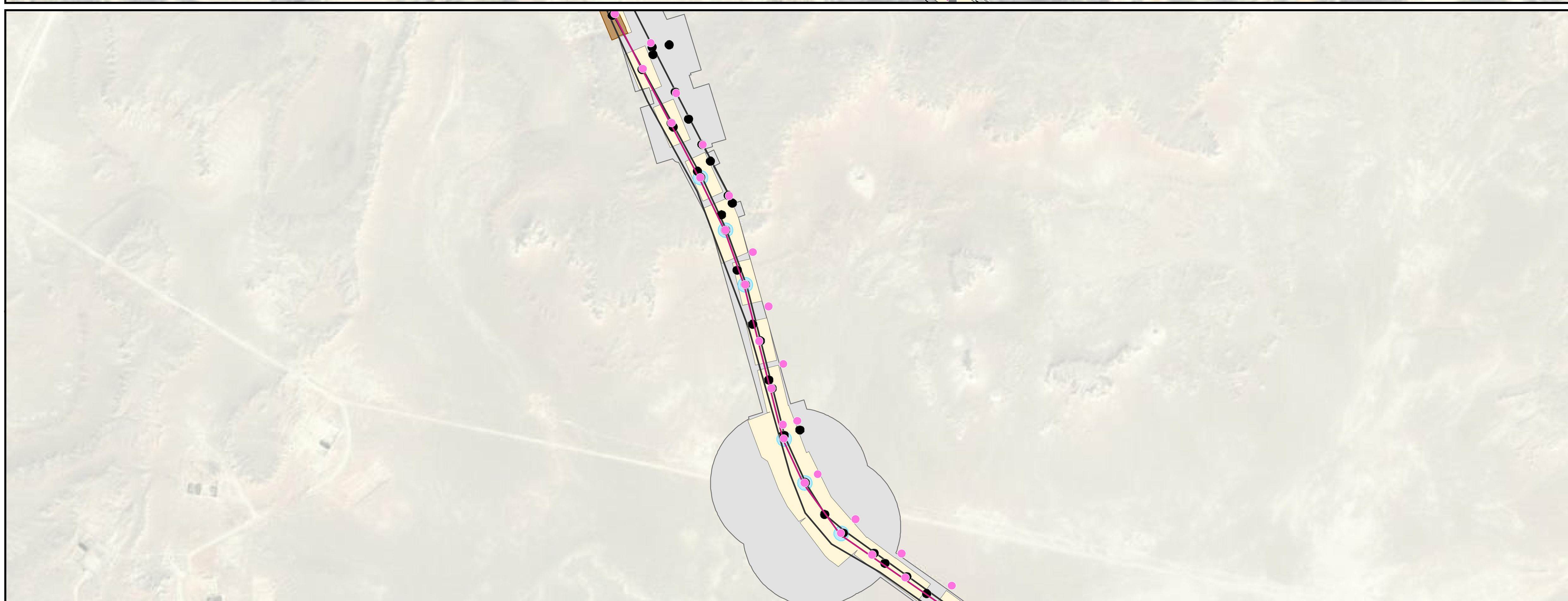
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M



FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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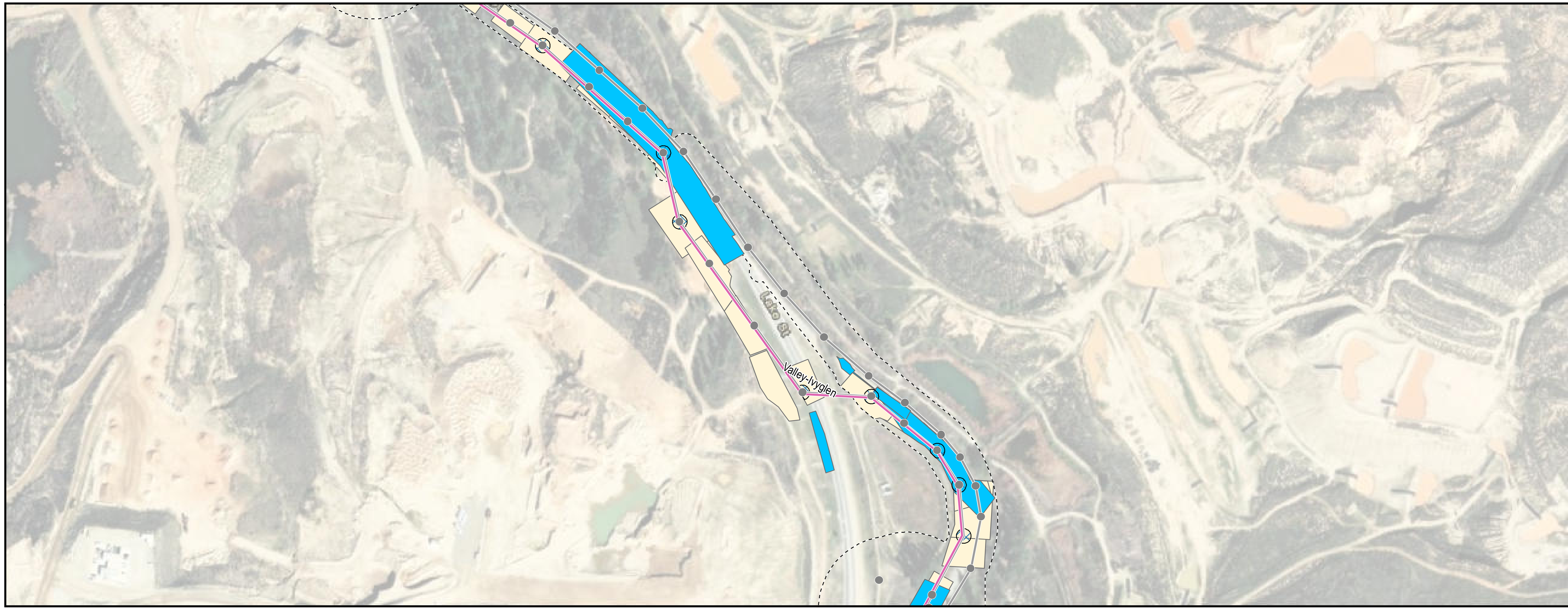
0 200 400 Feet

Figure N-1: Project Comparison Map

Alberhill System Project



Proposed Project Design

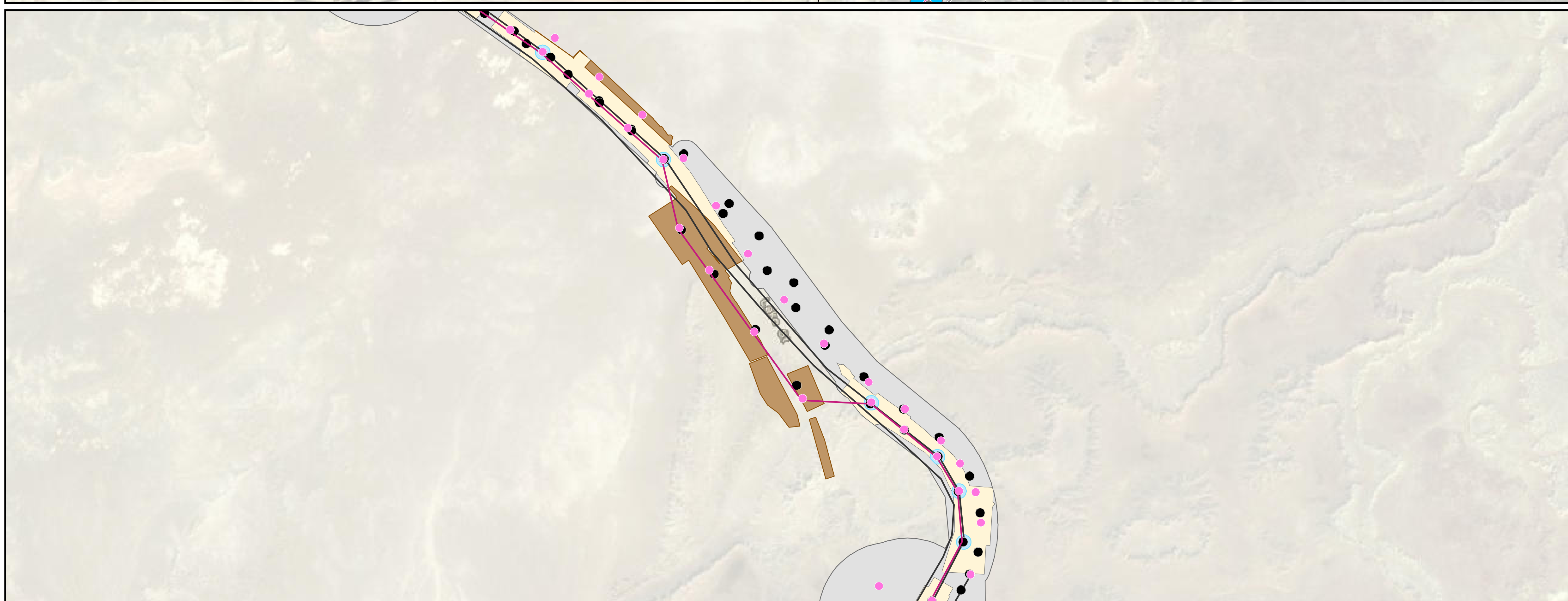
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M



FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

Feet
0 200 400

Figure N-1:
Project Comparison Map
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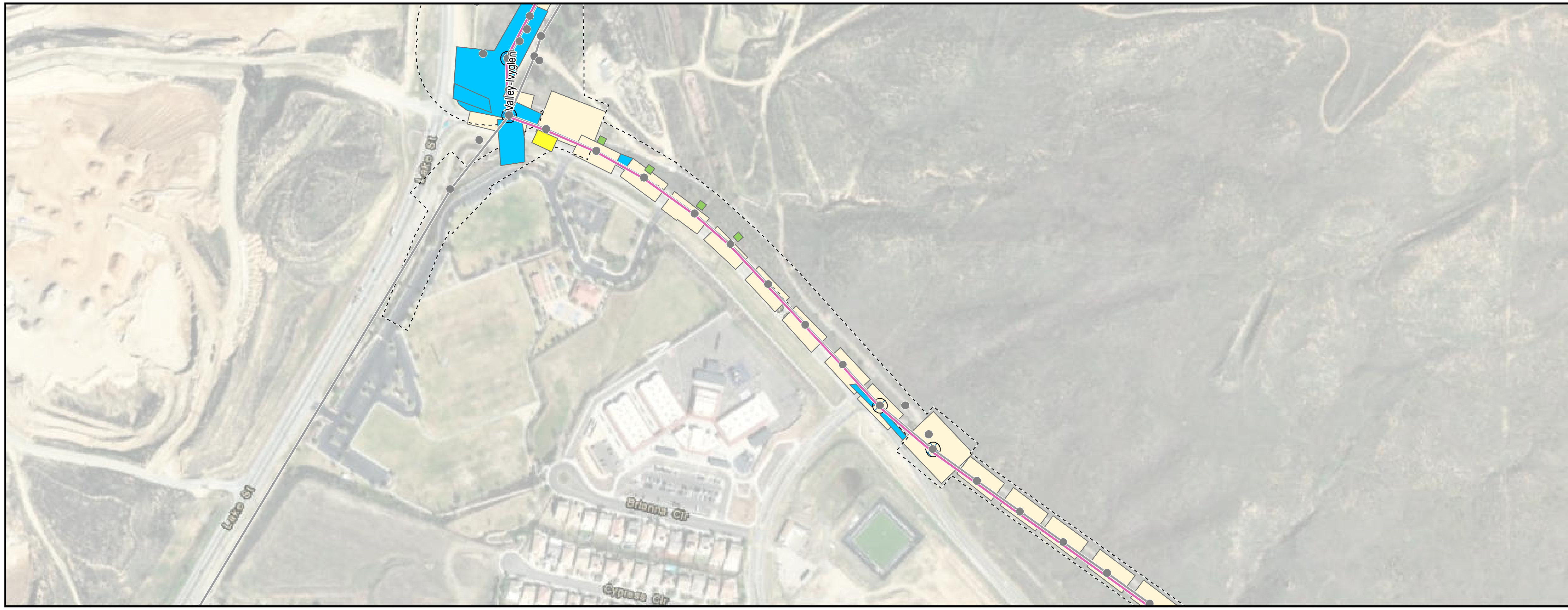
Alberhill System Project



Proposed Project Design

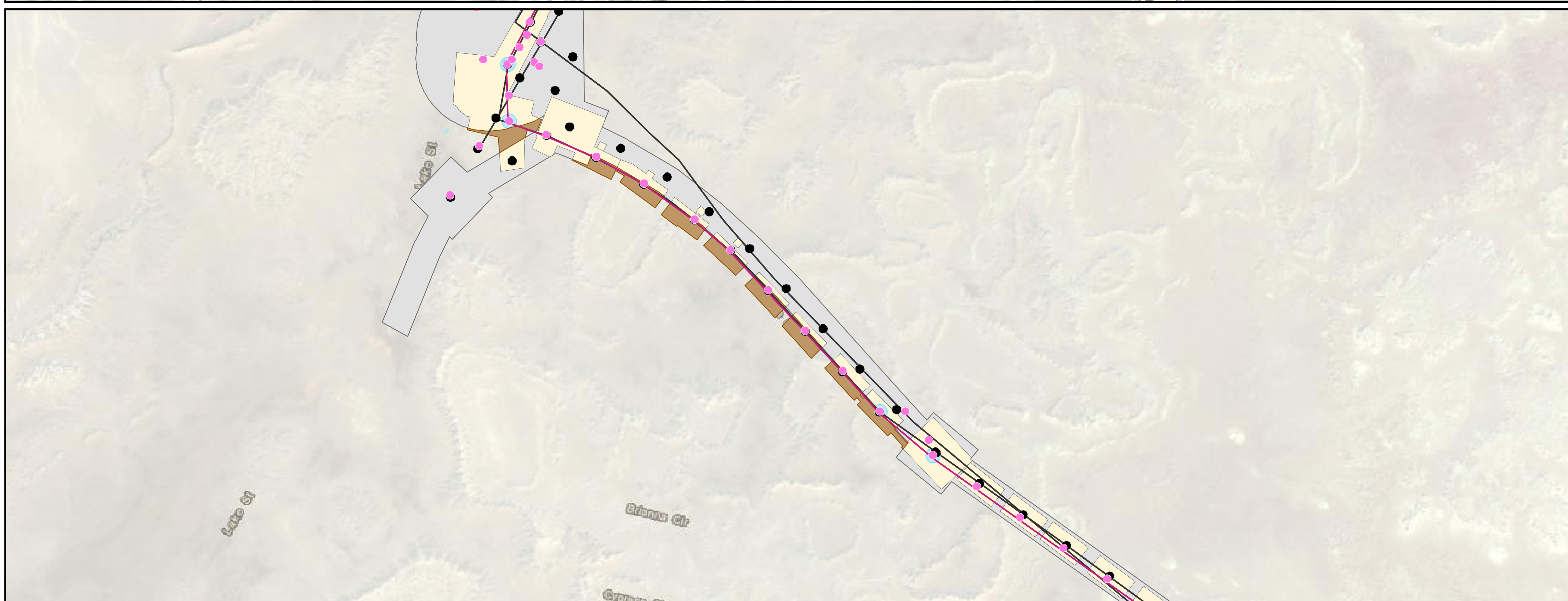
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M



FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

Feet
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Figure N-1:
Project Comparison Map
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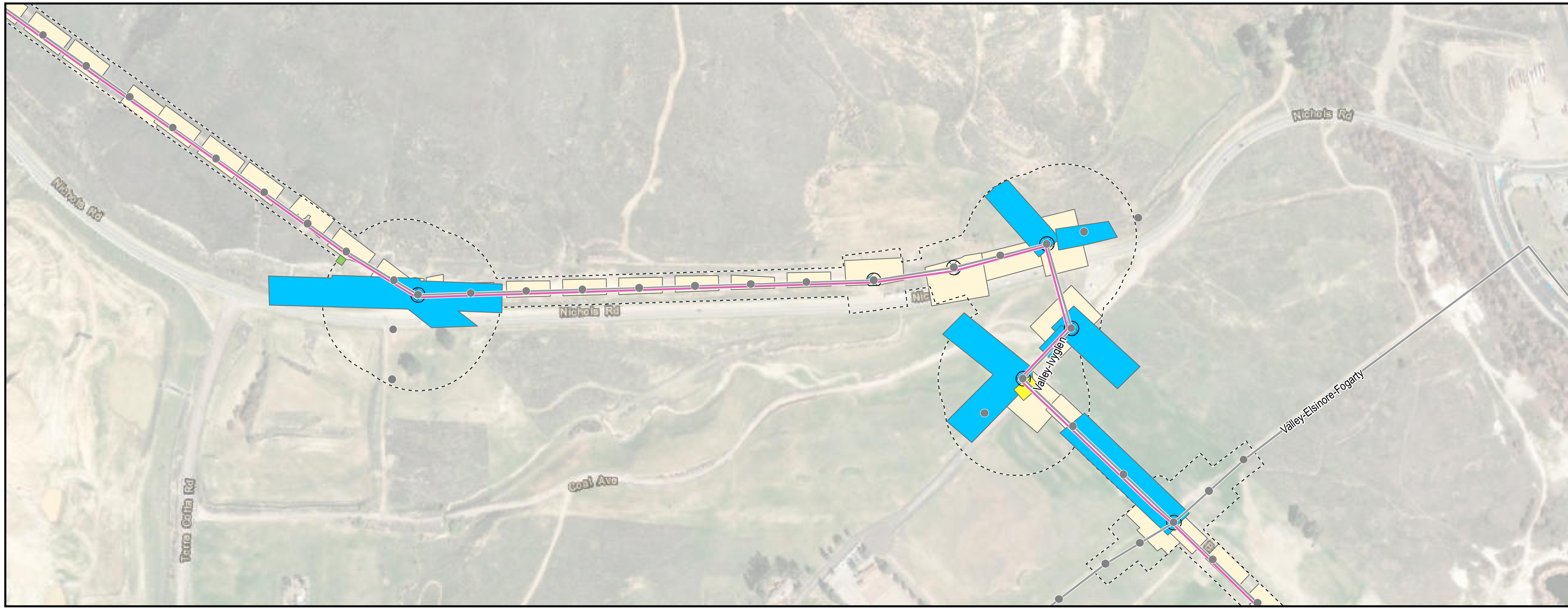
Alberhill System Project



Proposed Project Design

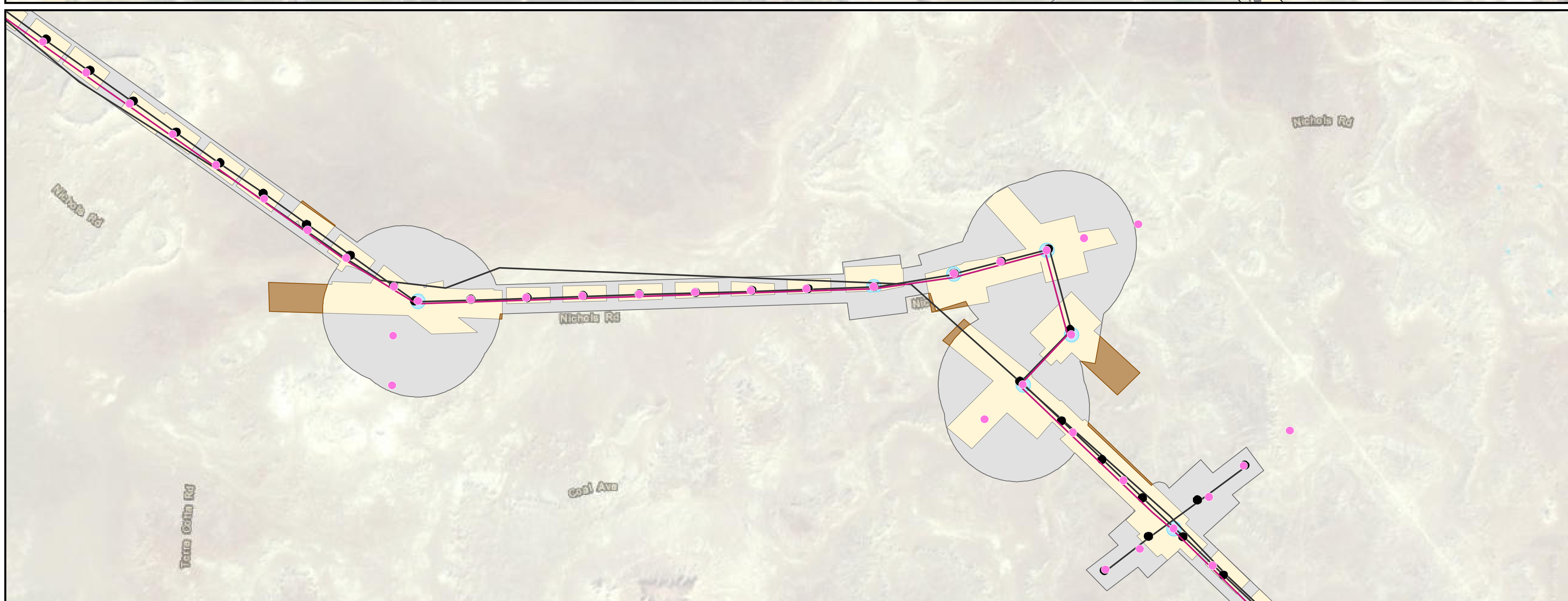
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M



FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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Figure N-1: Project Comparison Map 10 of 39

Alberhill System Project

Proposed Project Design

- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M

FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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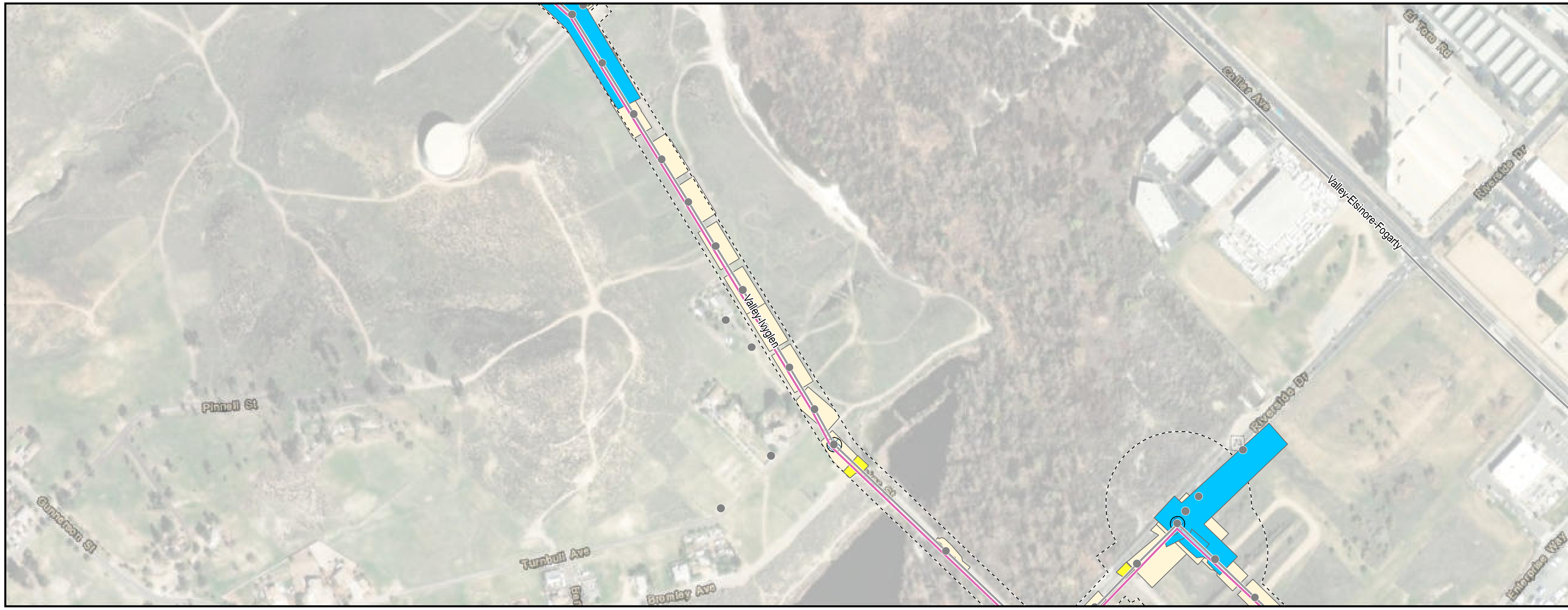

Figure N-1: Project Comparison Map
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Alberhill System Project

Proposed Project Design
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary
- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact
- O&M

FEIR Design vs Proposed Project Design
- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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Figure N-1: Project Comparison Map
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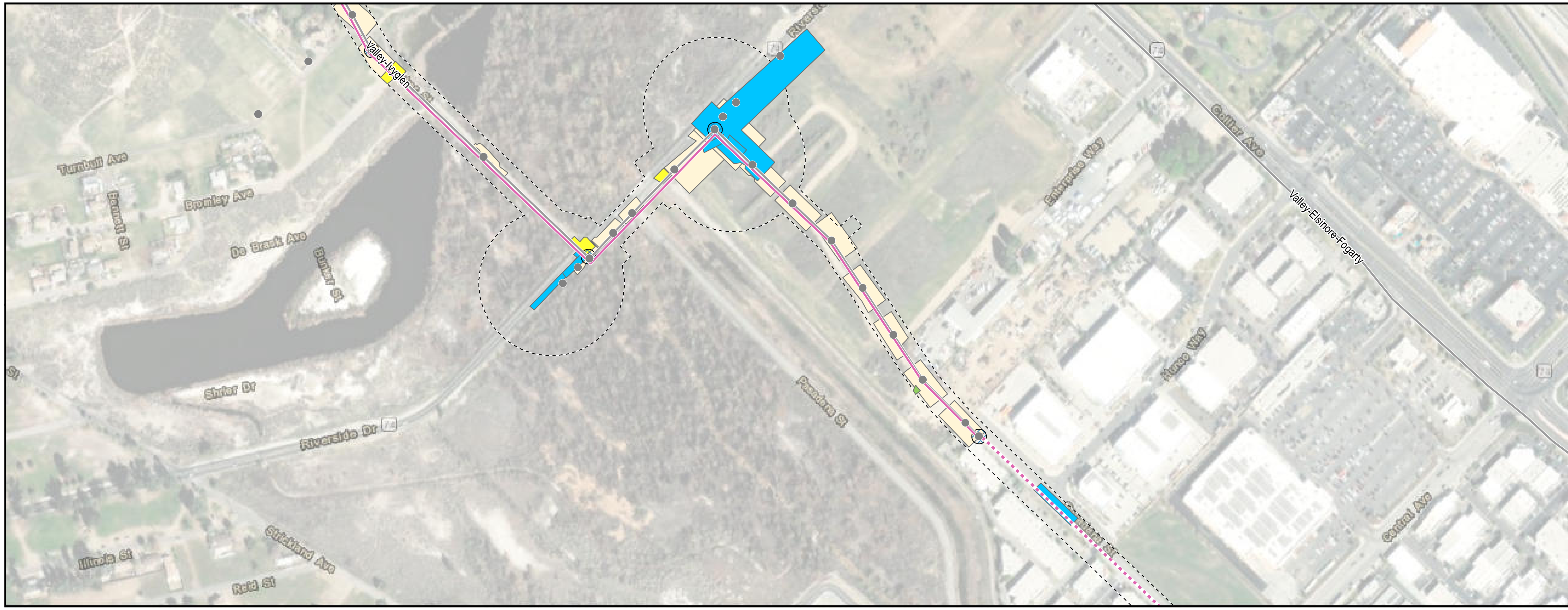
Alberhill System Project



Proposed Project Design

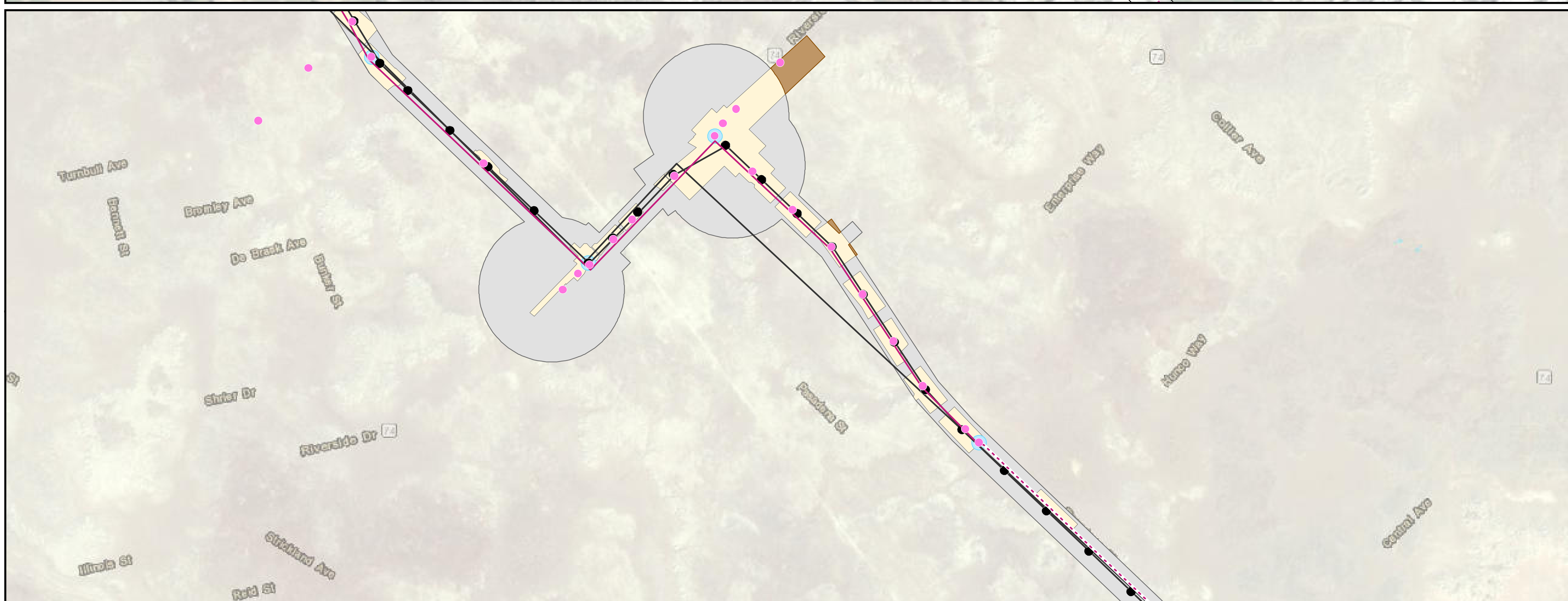
- Existing 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Proposed 115 kV Cable in Existing Underground Duct Bank
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

No Impact

- O&M



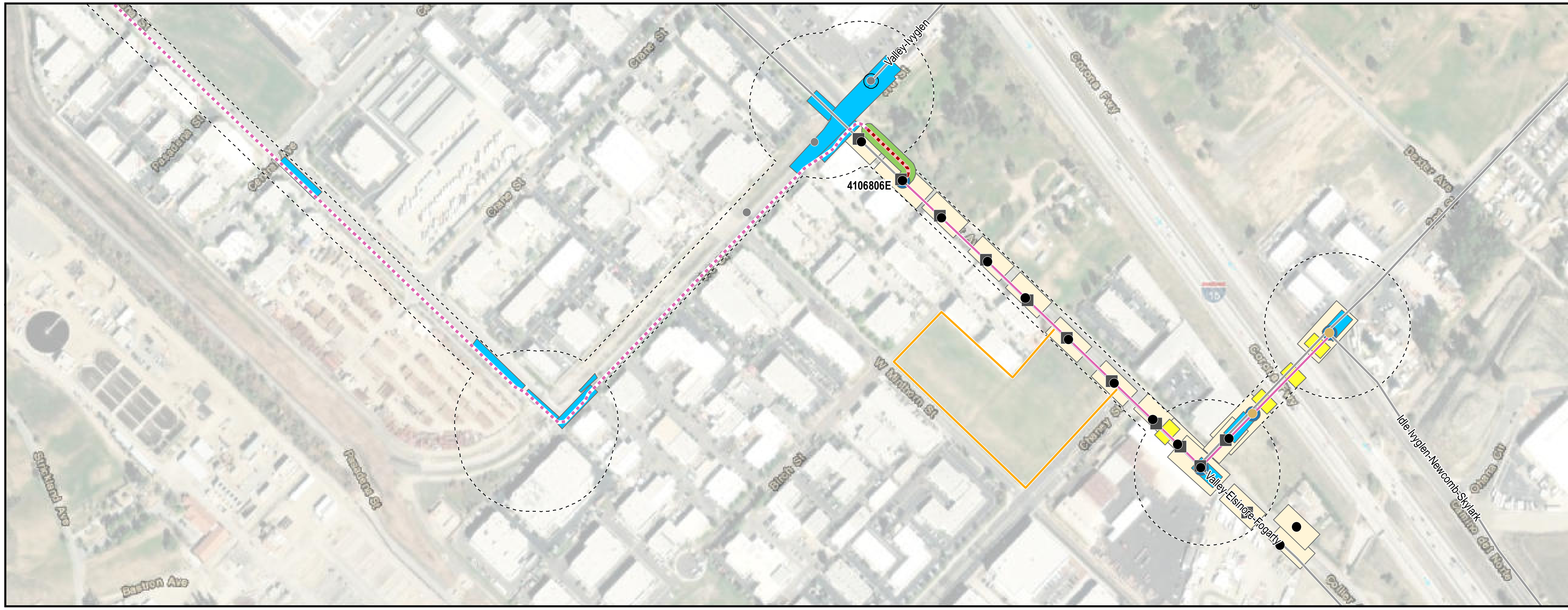
FEIR Design vs Proposed Project Design

- Final Existing 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- Final Underground Overhead 115 kV Subtransmission Line
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

Feet
0 200 400

Figure N-1: Project Comparison Map 13 of 39

Alberhill System Project



Proposed Project Design

- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Proposed 115 kV Cable in Existing Underground Duct Bank
- Proposed 115 kV Cable in New Underground Duct Bank
- Existing Overhead 115 kV Overhead Line

Temporary

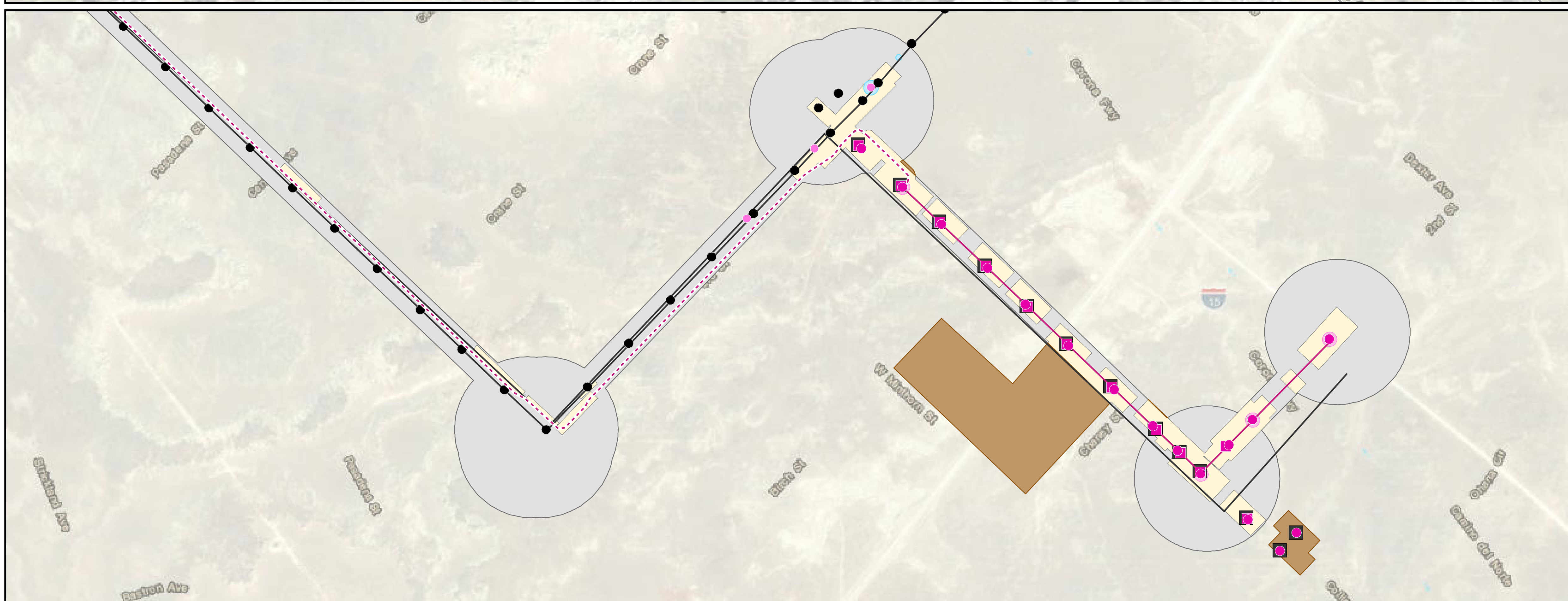
- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M

No Impact

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- Final Underground Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR VIG 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Permanent Impact
- New Temporary Impact
- No Change
- Temporary/Permament to No Impact

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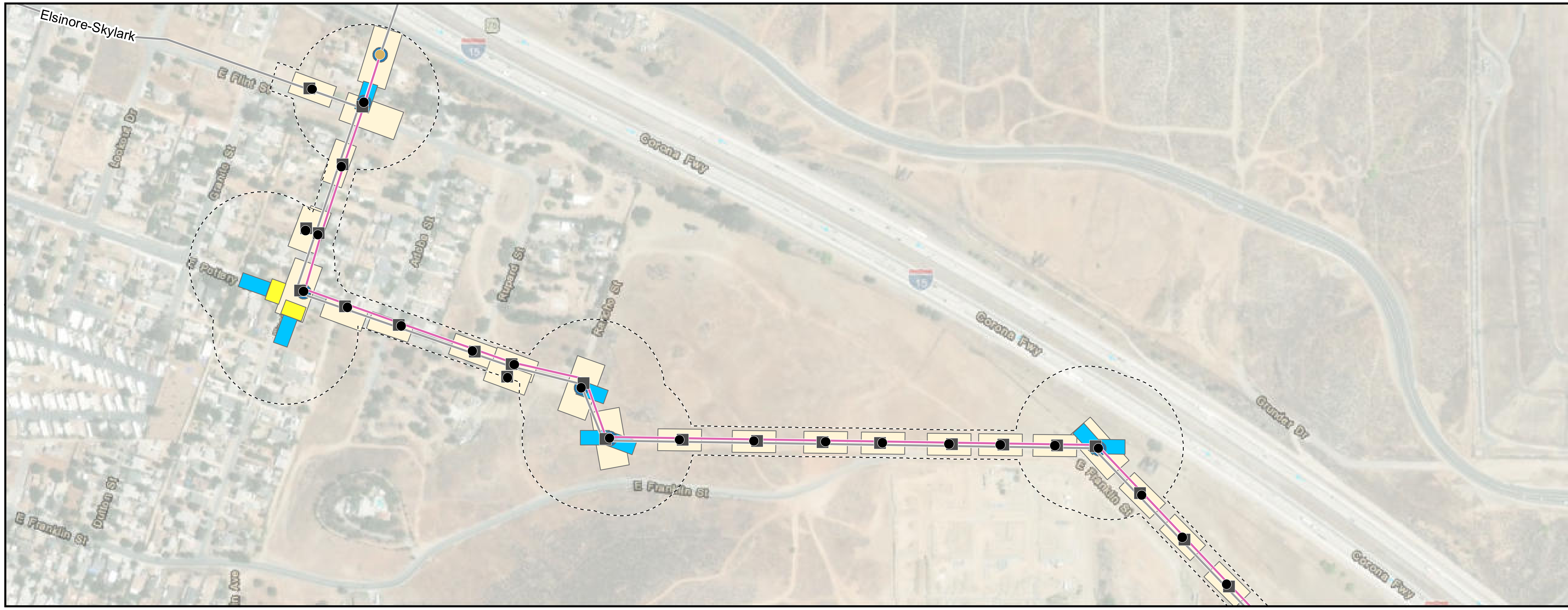
Figure N-1: Project Comparison Map

Alberhill System Project



Proposed Project Design

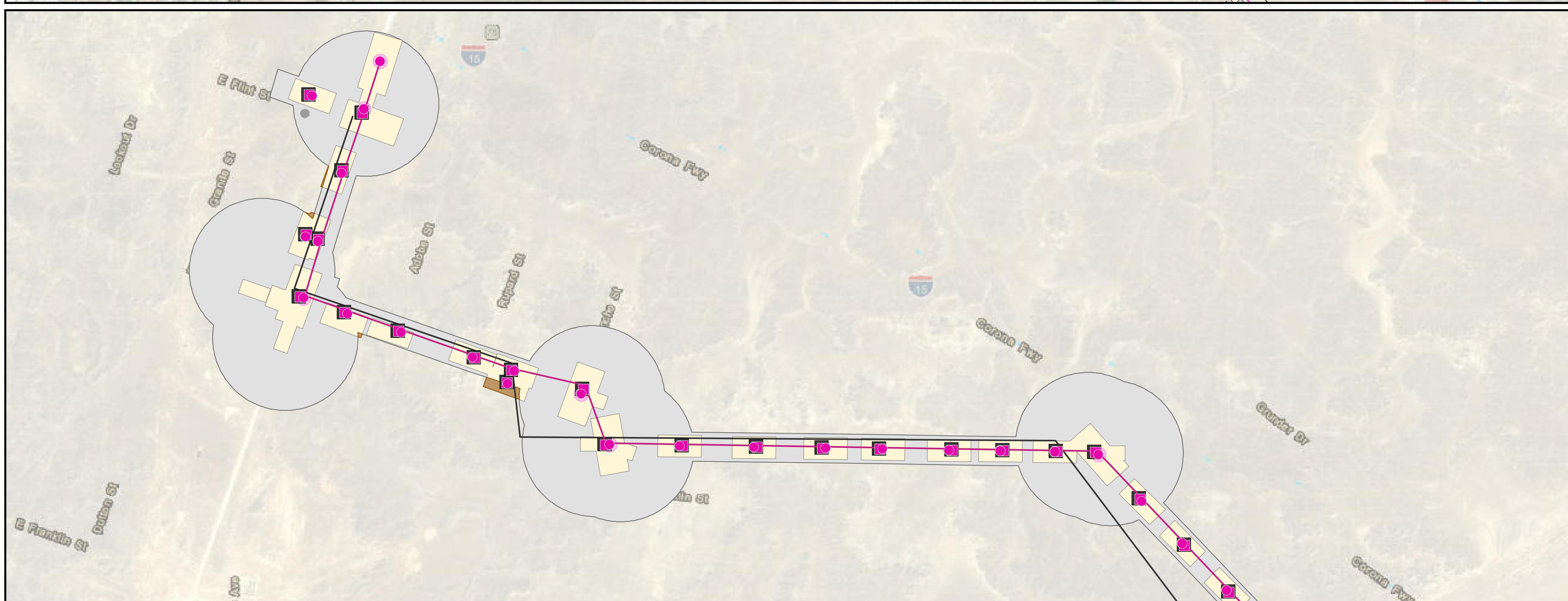
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Permanent Impact
- New Temporary Impact
- No Change

Feet
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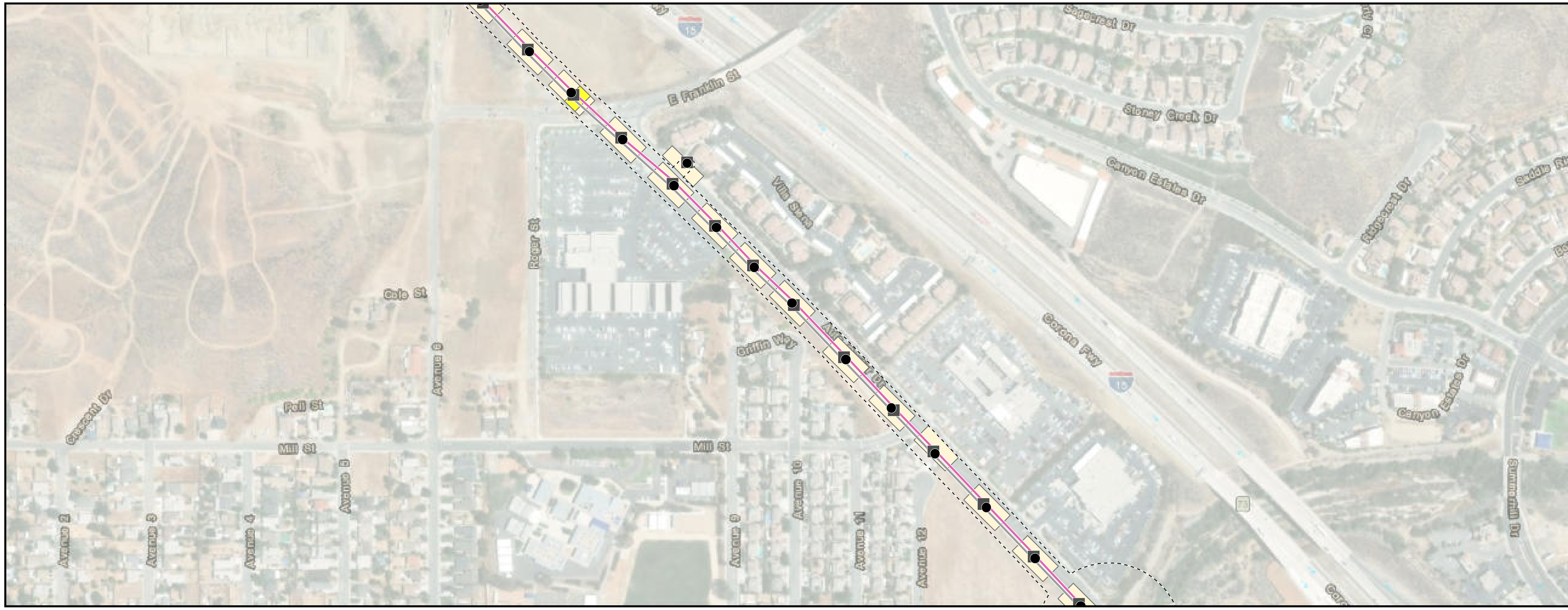


Figure N-1: Project Comparison Map 15 of 39

Alberhill System Project

Proposed Project Design

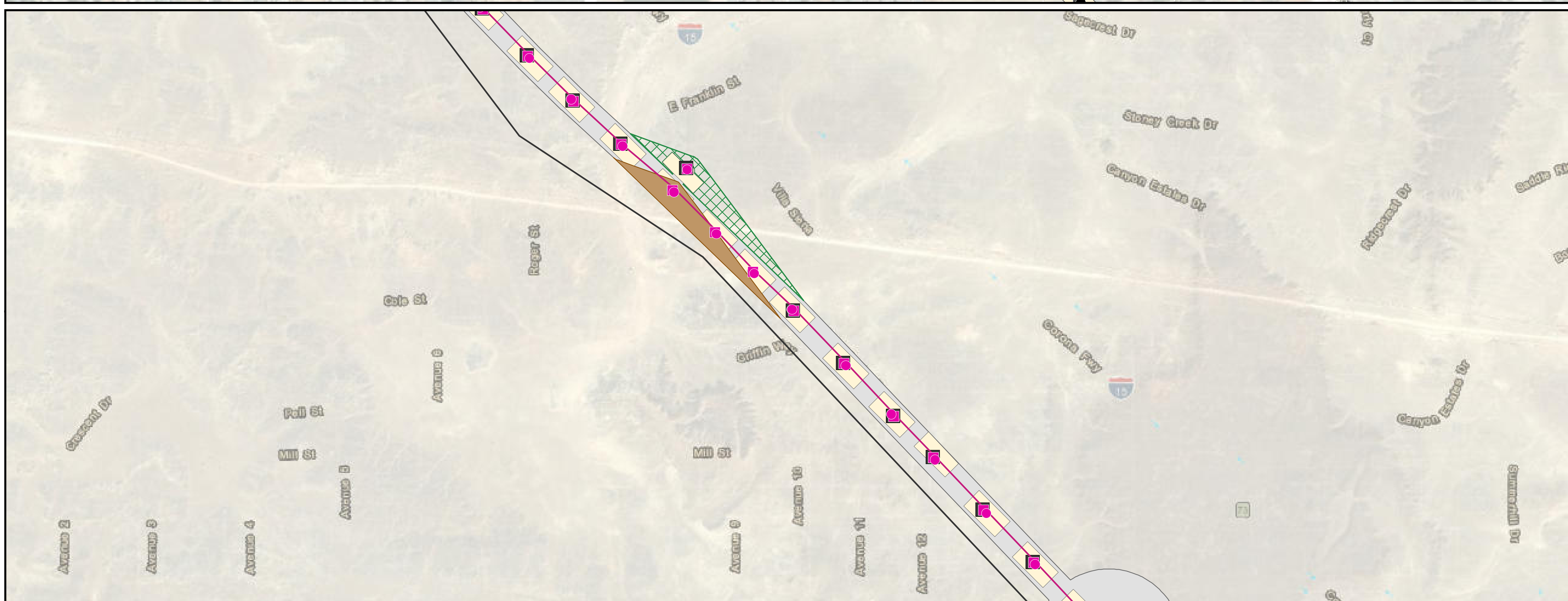
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Permanent Impact
- New Temporary Impact
- No Change
- Removed from Project

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Figure N-1: Project Comparison Map
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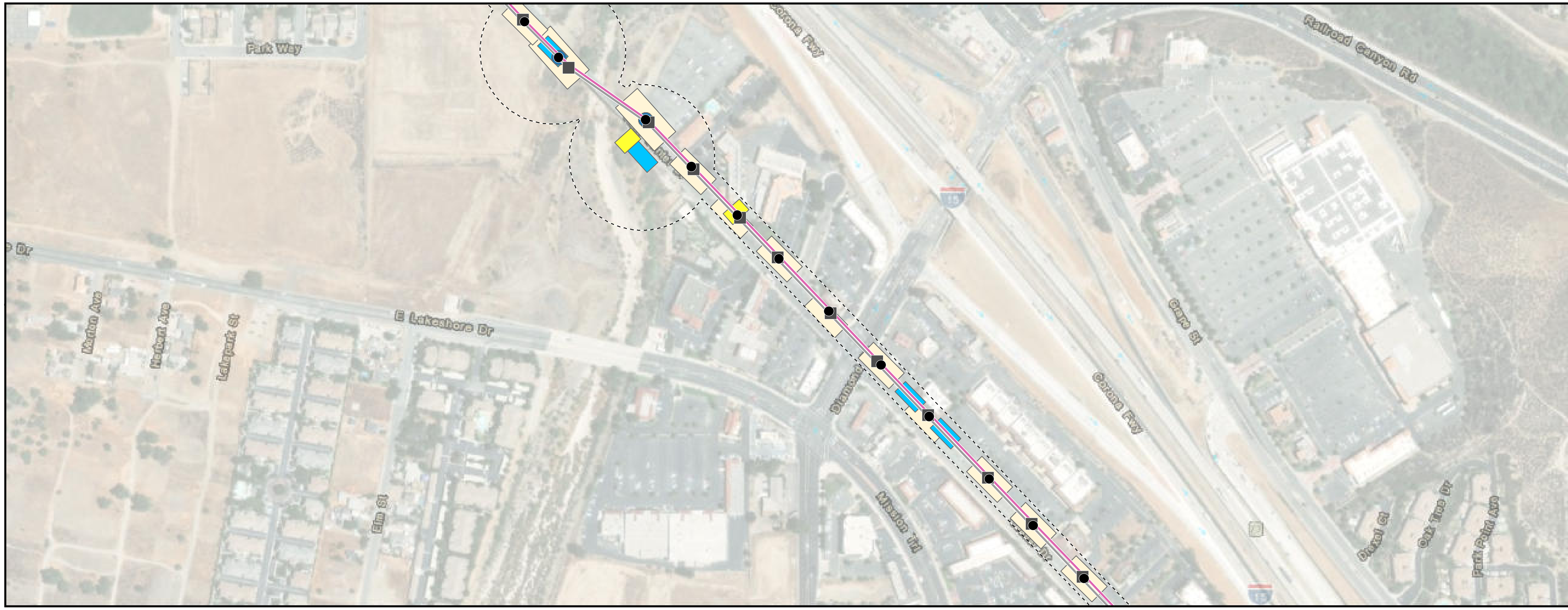
Alberhill System Project



Proposed Project Design

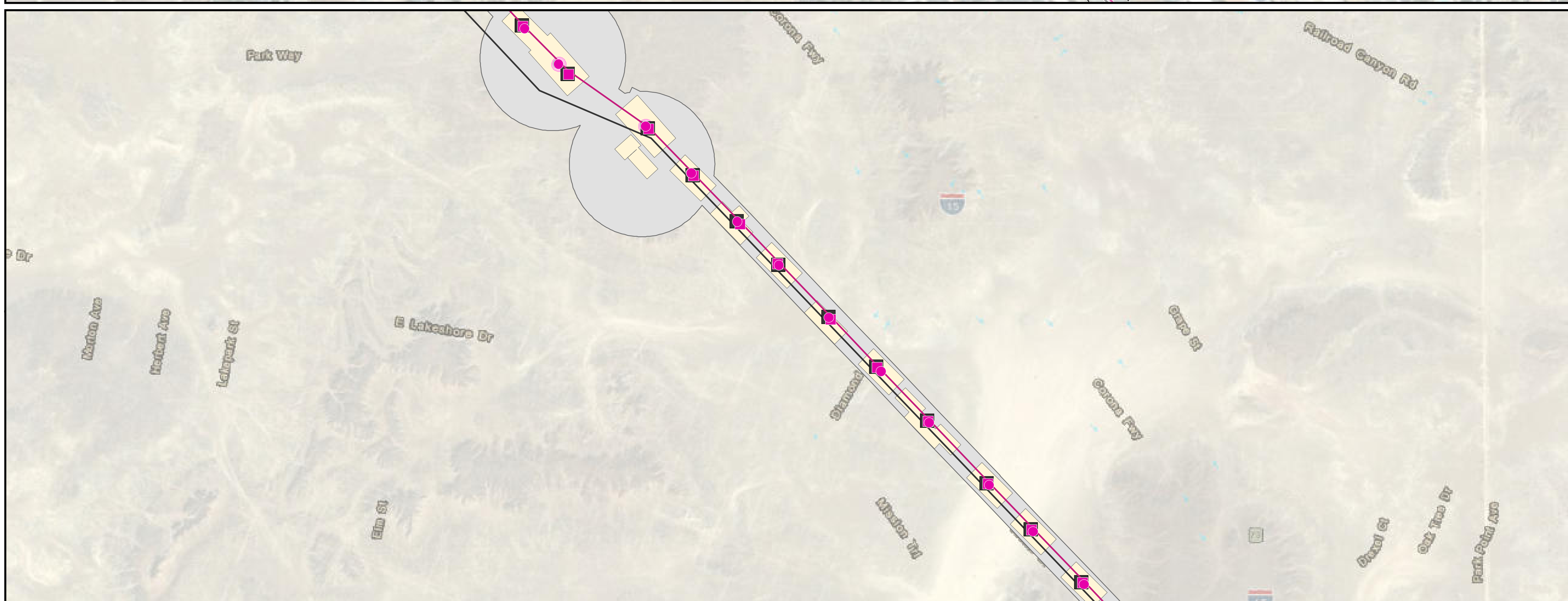
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

Feet
0 200 400

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Figure N-1:
Project Comparison Map
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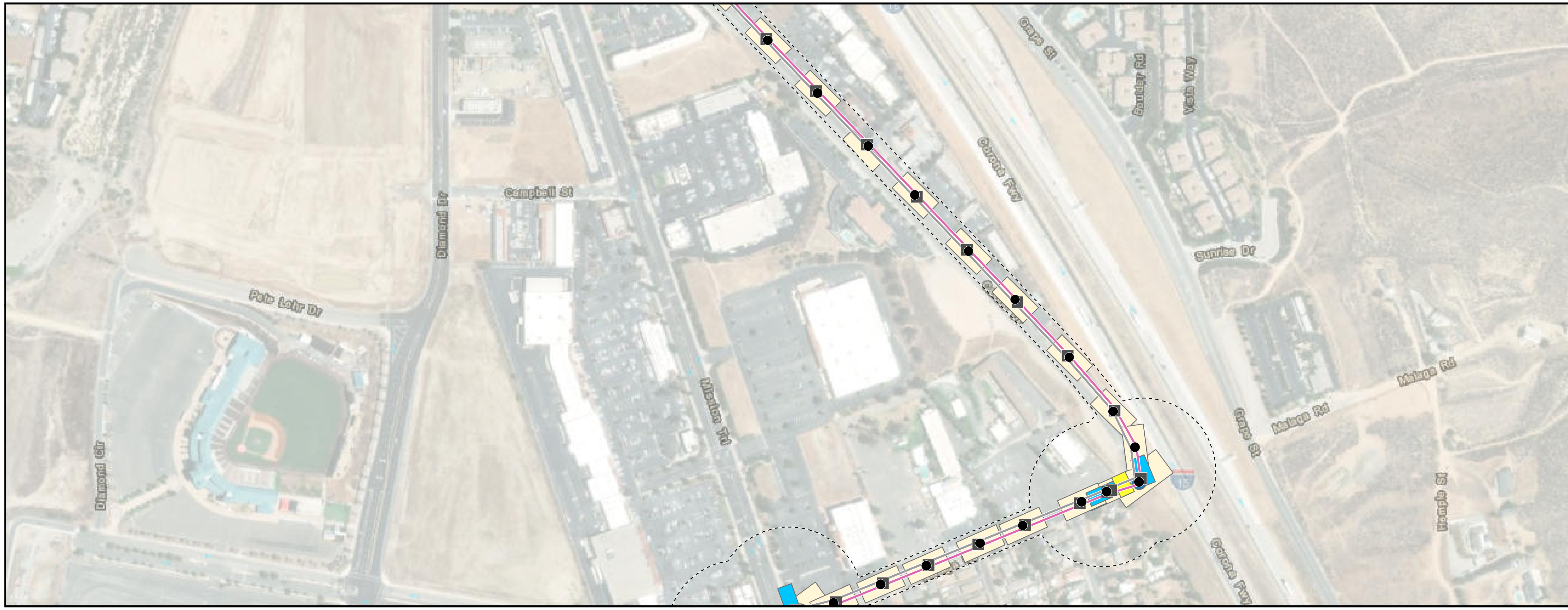
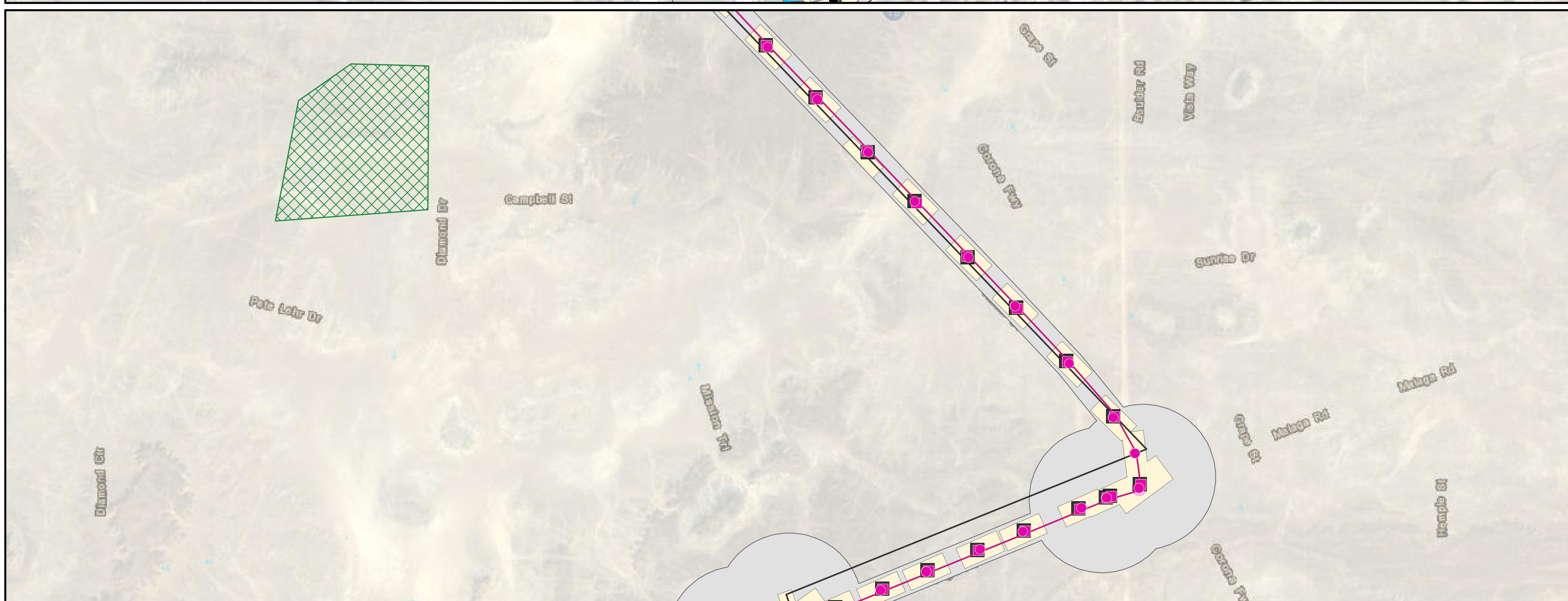
Alberhill System Project



Proposed Project Design
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent
- O&M



FEIR Design vs Proposed Project Design
- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change
- Removed from Project

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Figure N-1: Project Comparison Map
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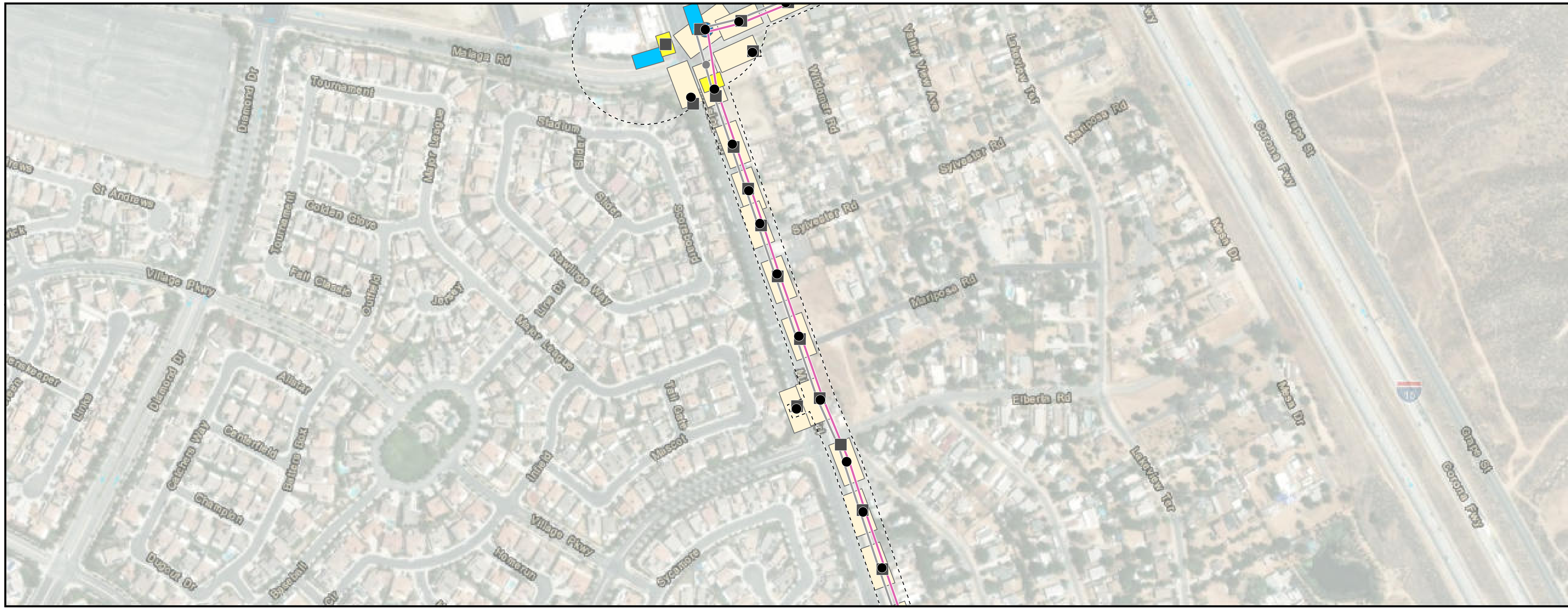
Alberhill System Project



Proposed Project Design

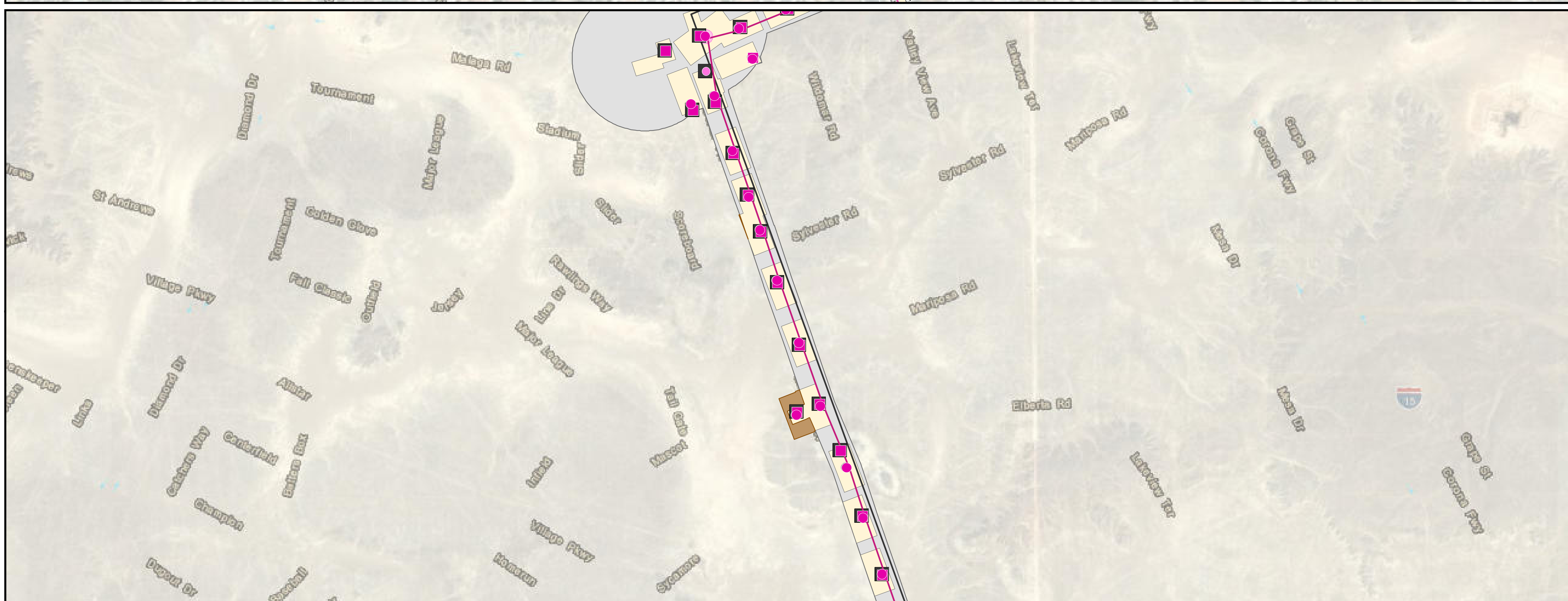
- New 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

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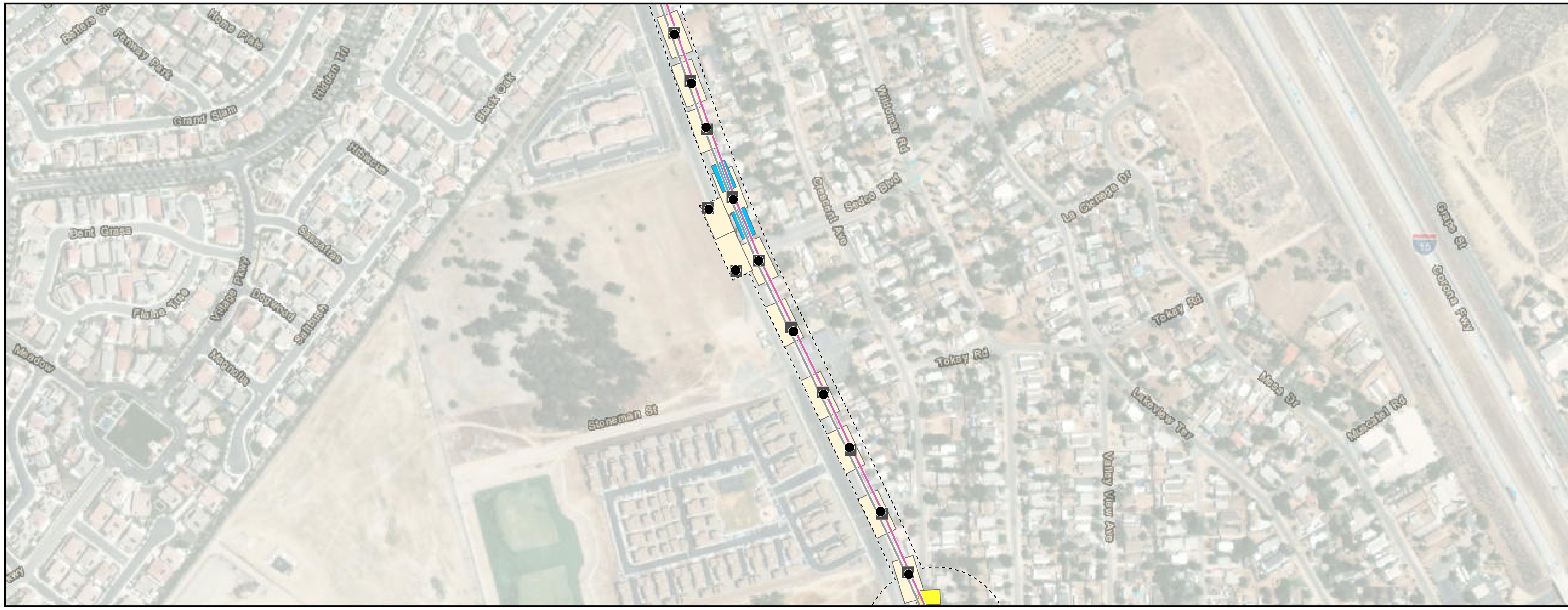

Figure N-1:
Project Comparison Map
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Alberhill System Project

Proposed Project Design

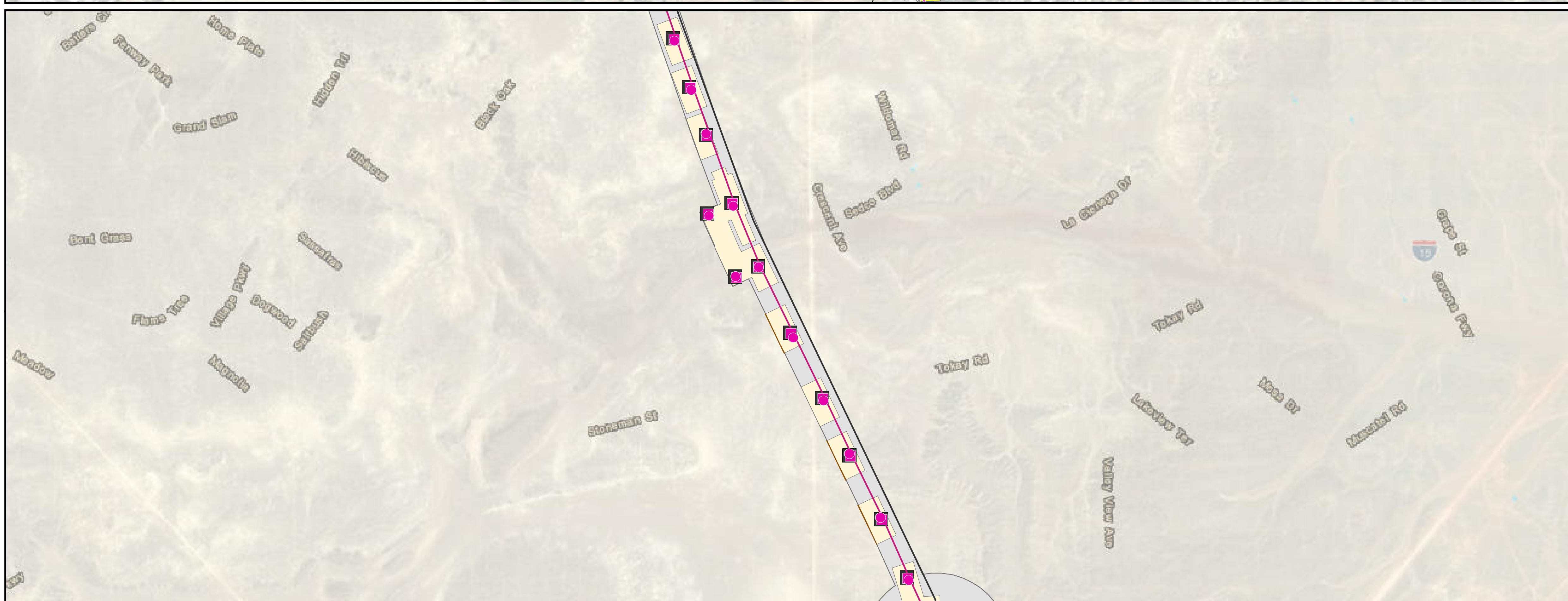
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

INSIGNIA ENVIRONMENTAL

N

0 200 400 Feet

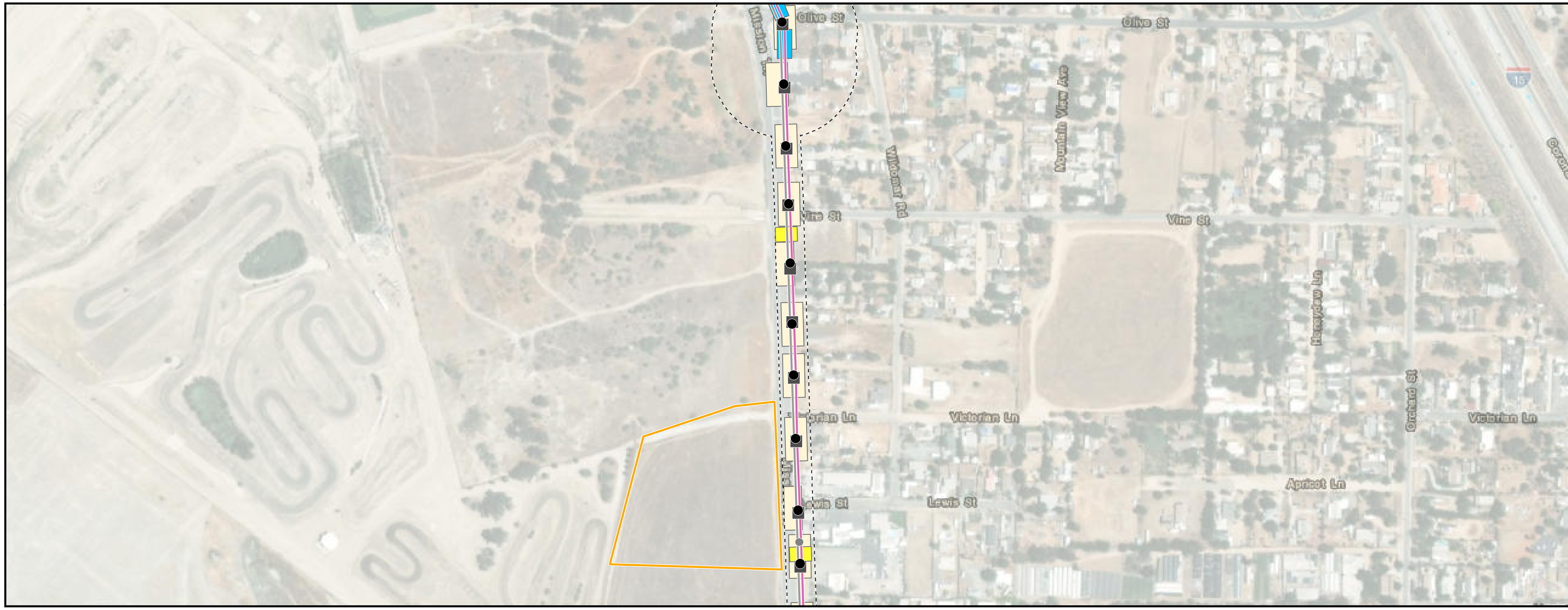


Figure N-1: Project Comparison Map

Alberhill System Project

Proposed Project Design

- New 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M

FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Removed from Project

SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company

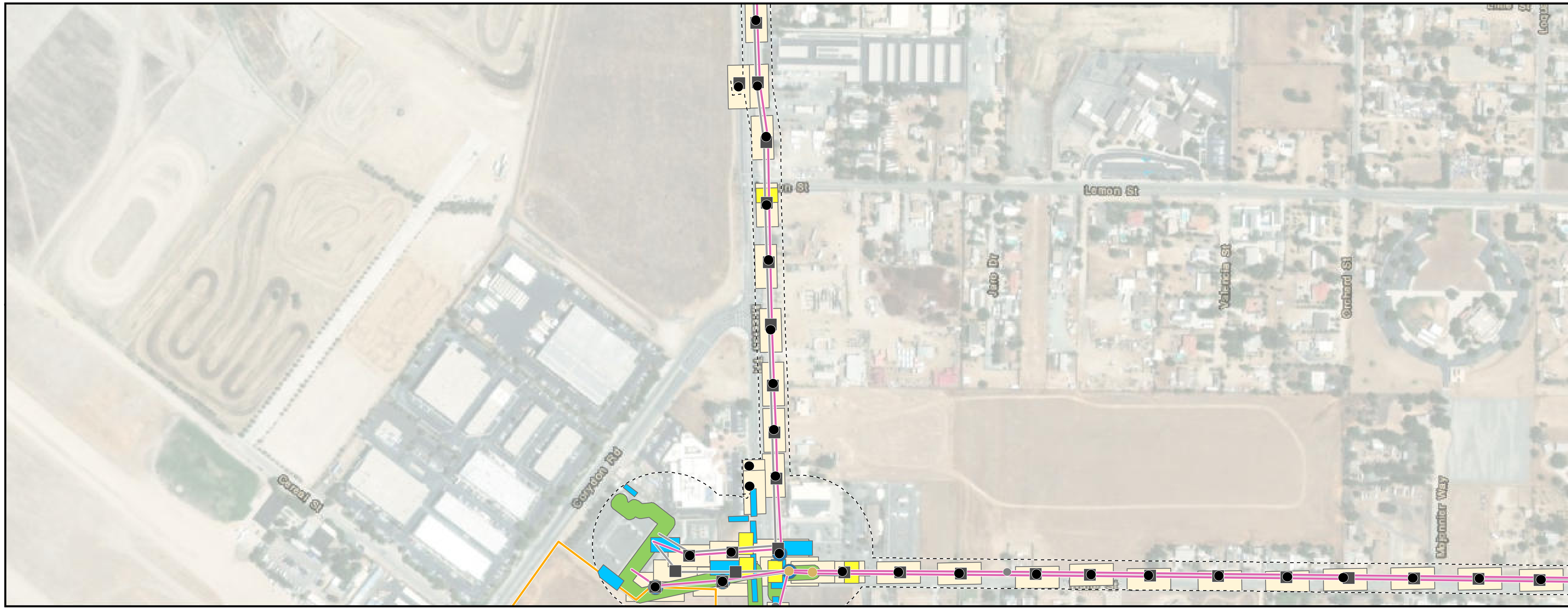
INSIGNIA ENVIRONMENTAL

N

0 200 400 Feet

Figure N-1: Project Comparison Map 21 of 39

Alberhill System Project



Proposed Project Design

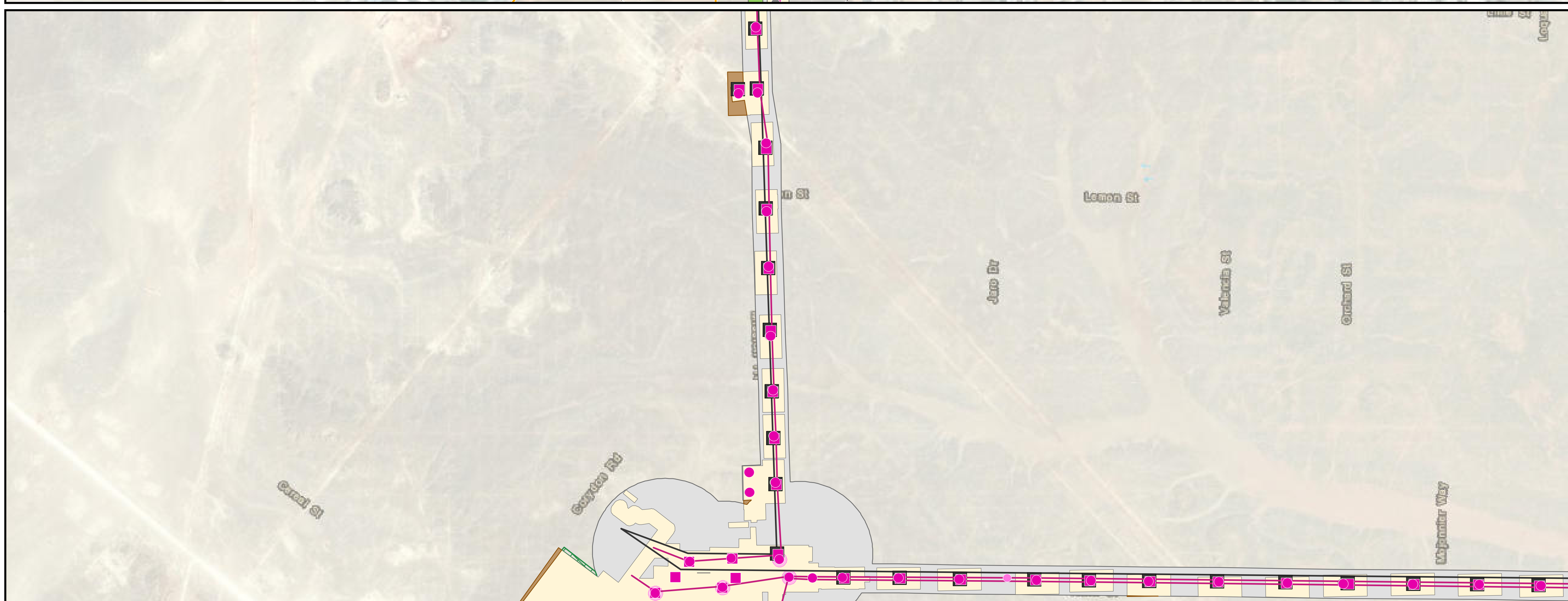
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

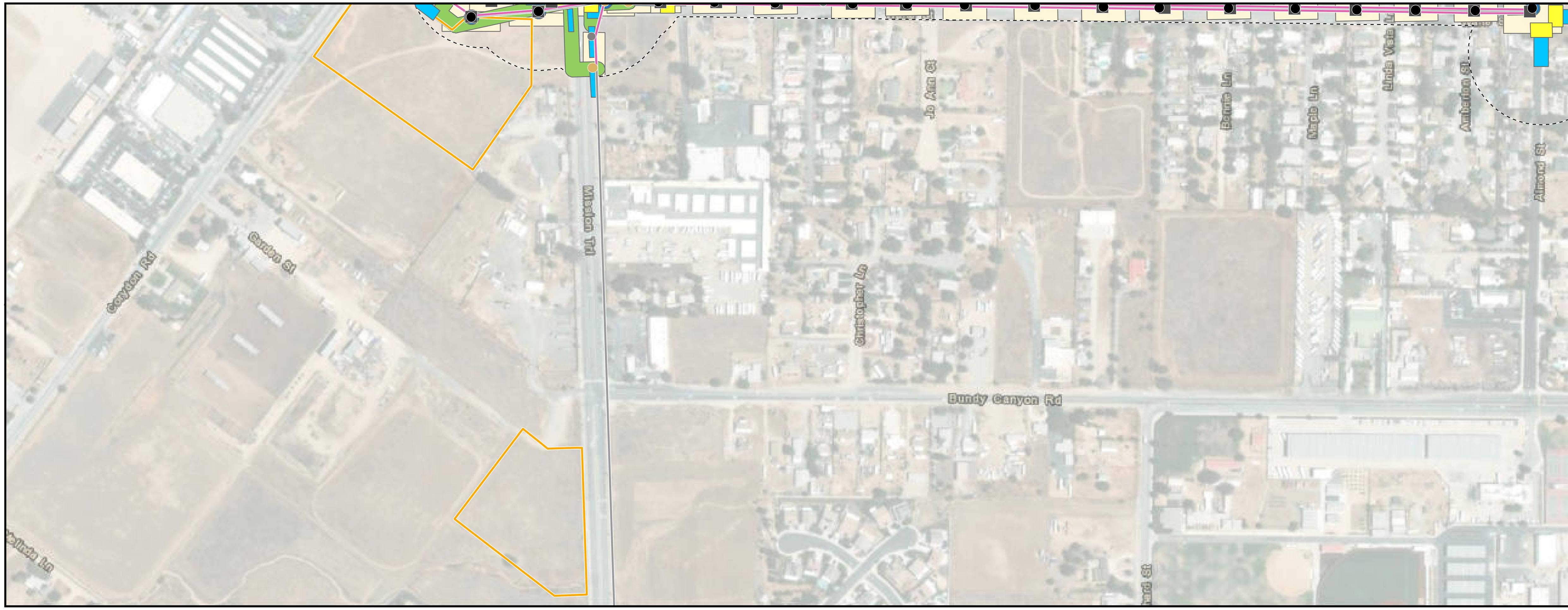
- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Removed from Project

Southern California Edison, An Edison International Company
INSIGNIA Environmental

0 200 400 Feet

Figure N-1:
Project Comparison Map

Alberhill System Project



Proposed Project Design

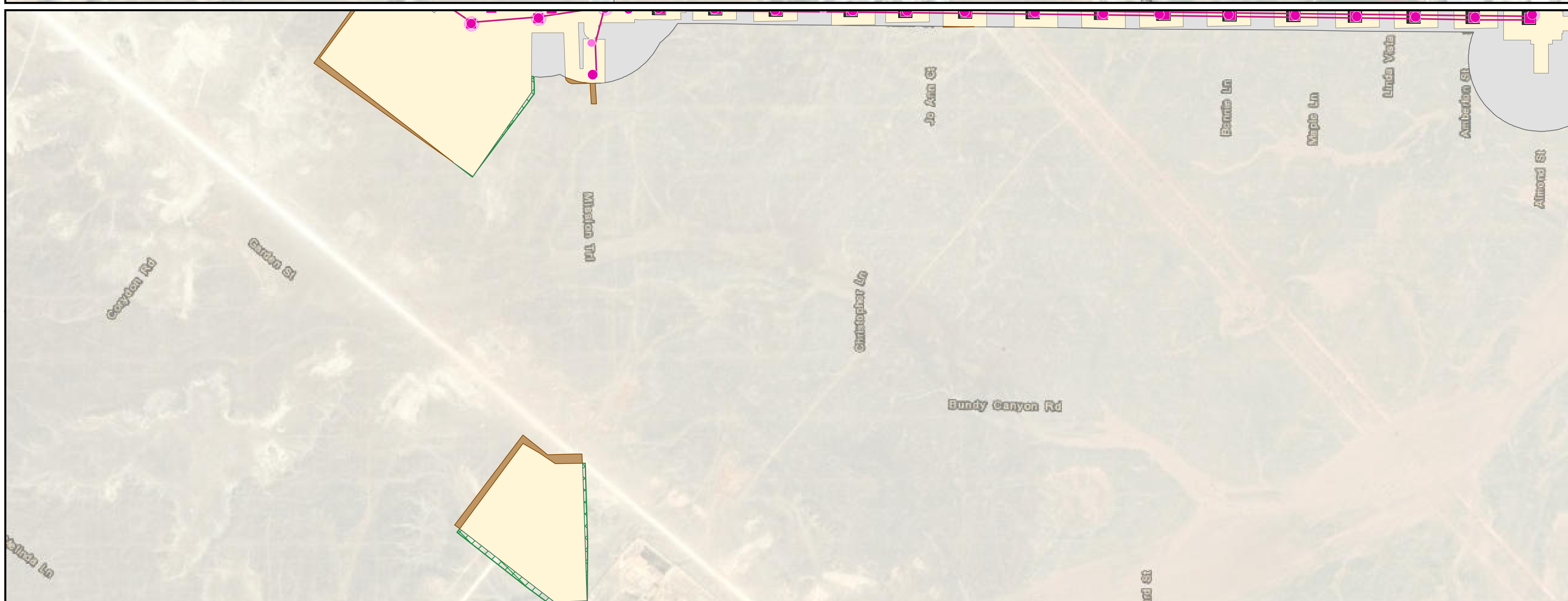
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change
- Removed from Project

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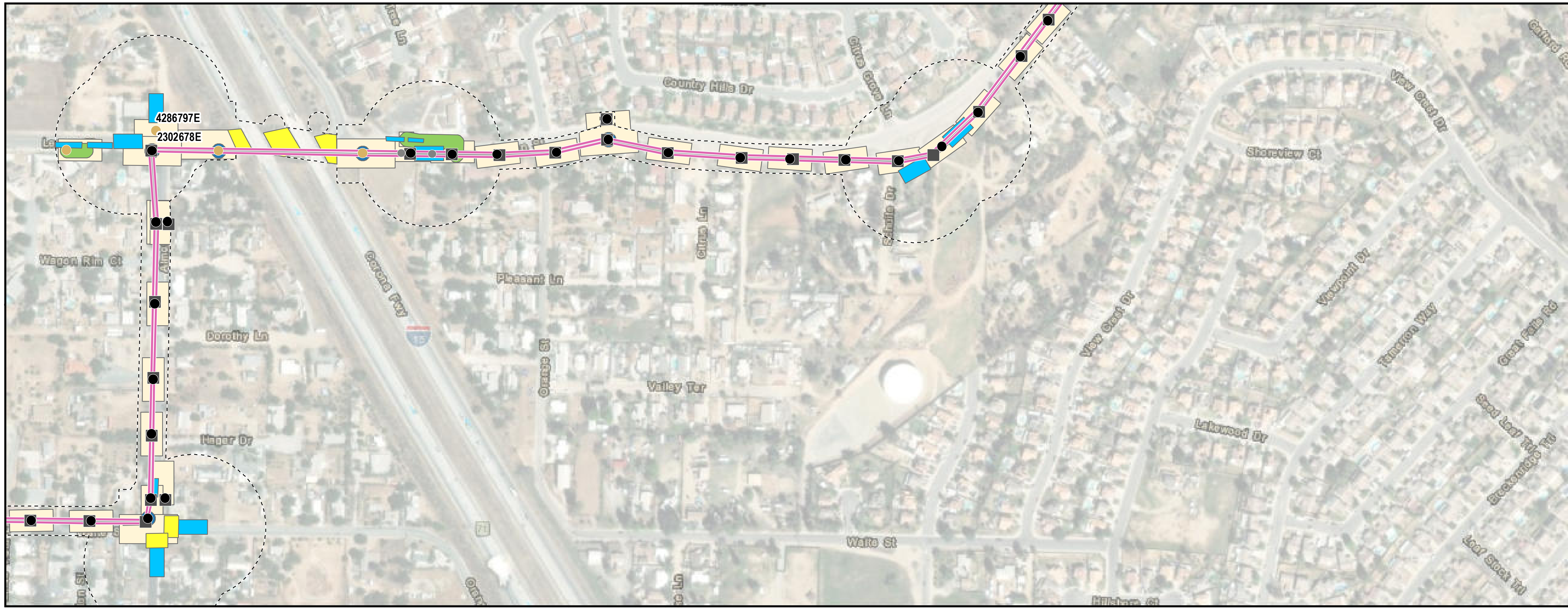
INSIGNIA ENVIRONMENTAL

N

0 200 400 Feet

Figure N-1:
Project Comparison Map
23 of 39

Alberhill System Project



Proposed Project Design

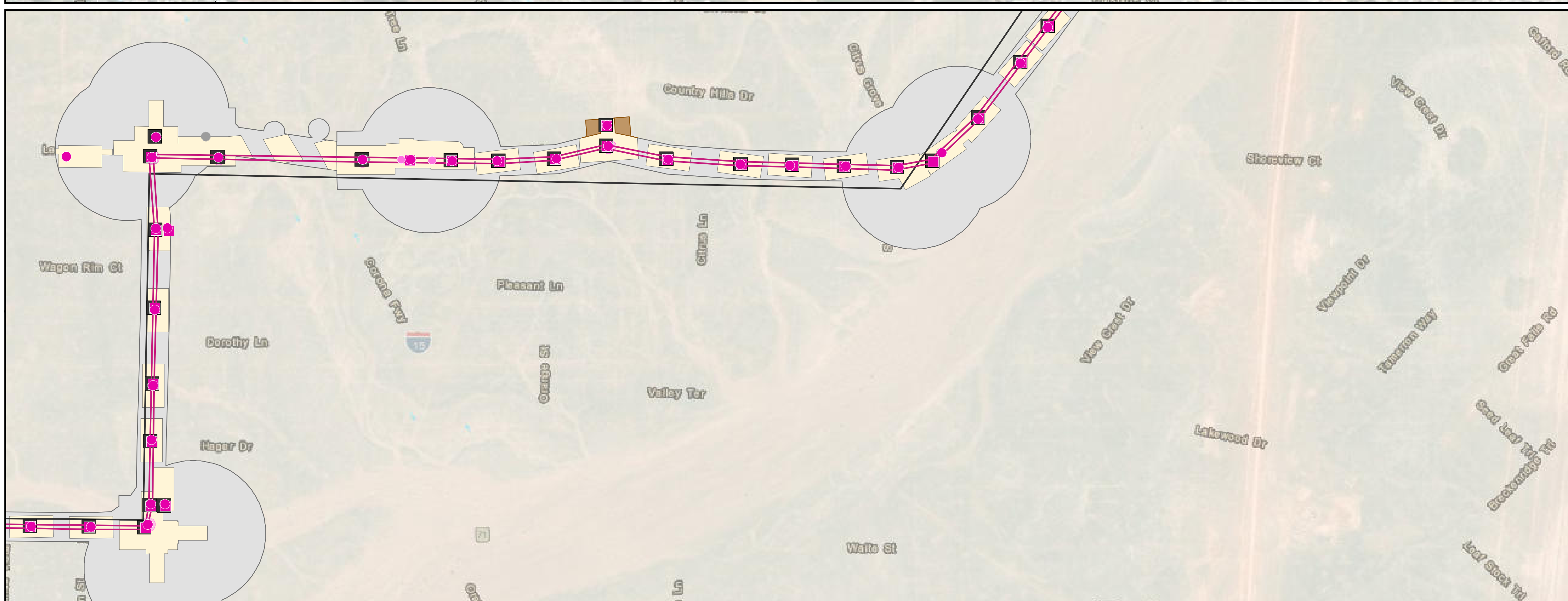
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

INSIGNIA ENVIRONMENTAL

N

Feet
0 200 400

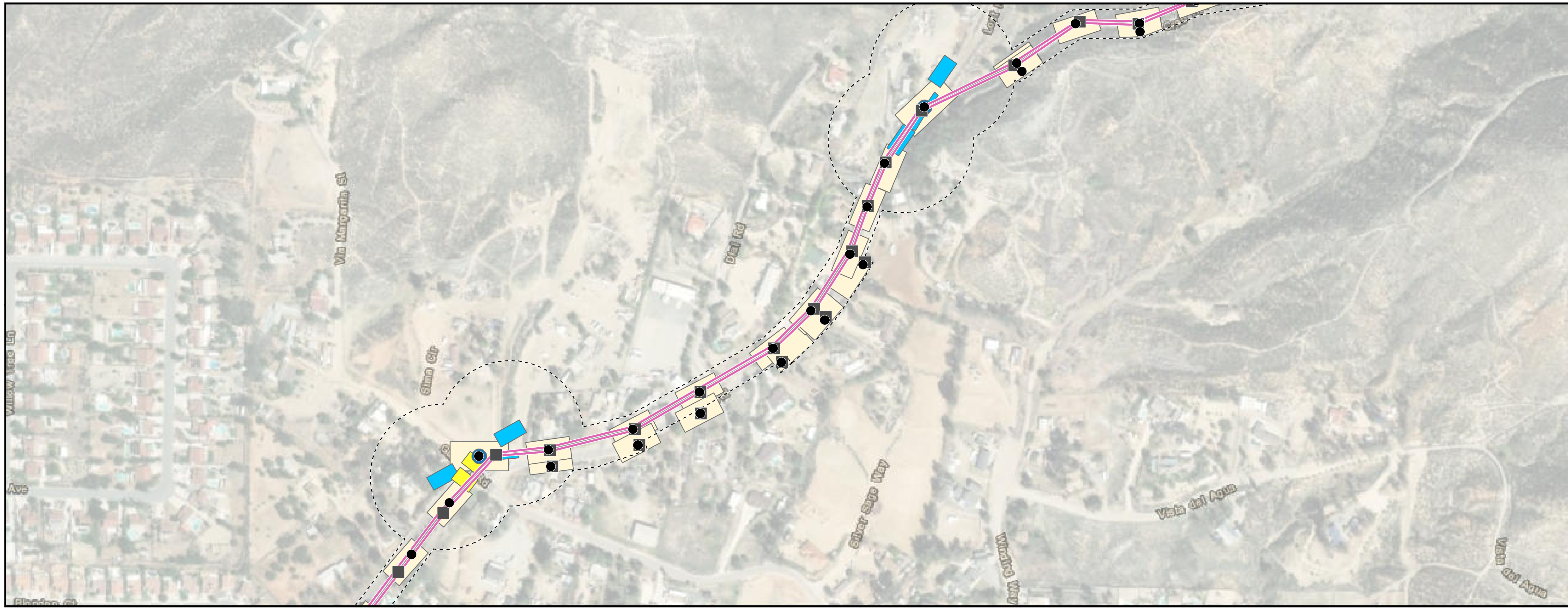


Figure N-1: Project Comparison Map 24 of 39

Alberhill System Project

Proposed Project Design

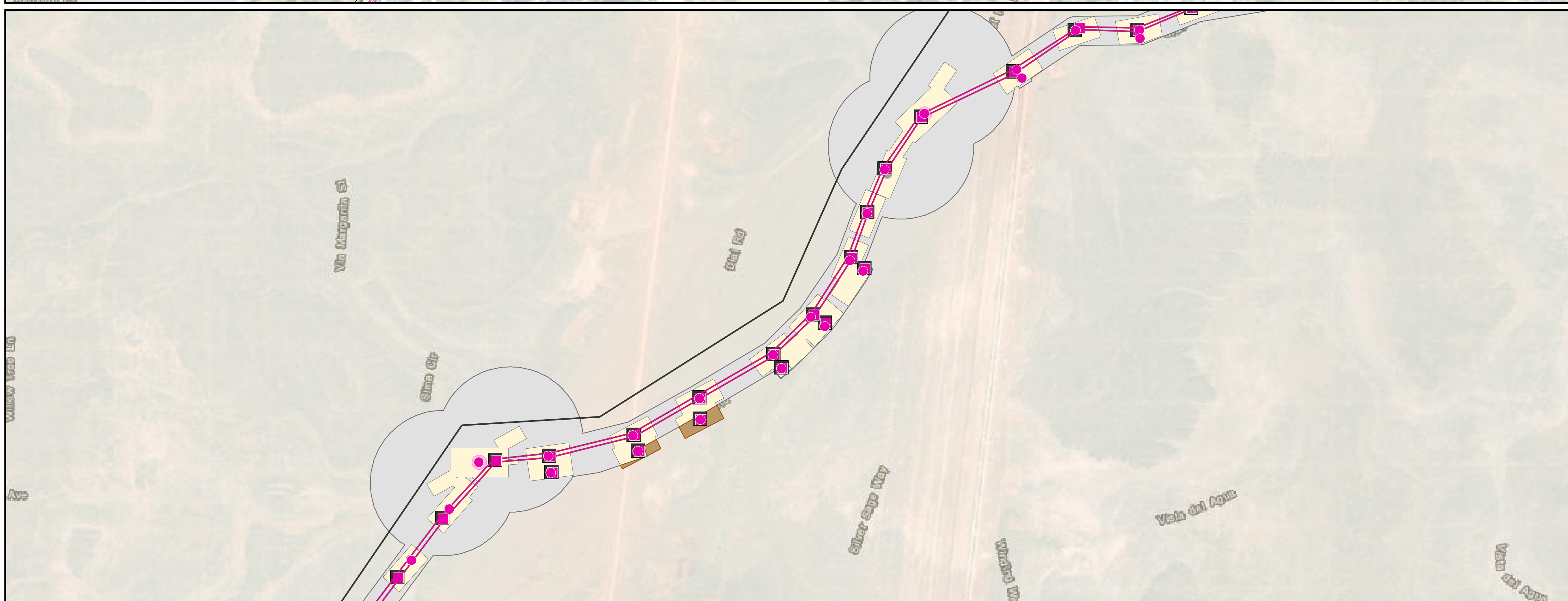
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Permanent Impact
- New Temporary Impact
- No Change

Feet 0 200 400

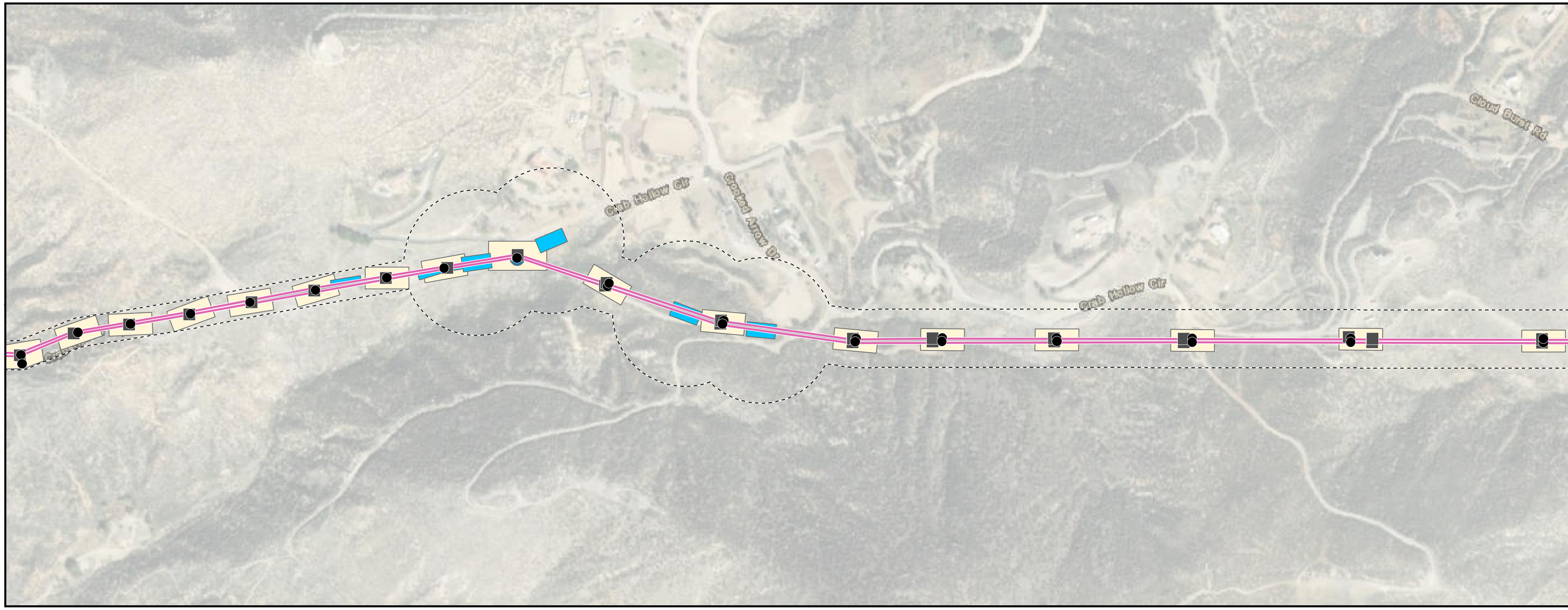


Figure N-1:
Project Comparison Map
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Alberhill System Project

Proposed Project Design

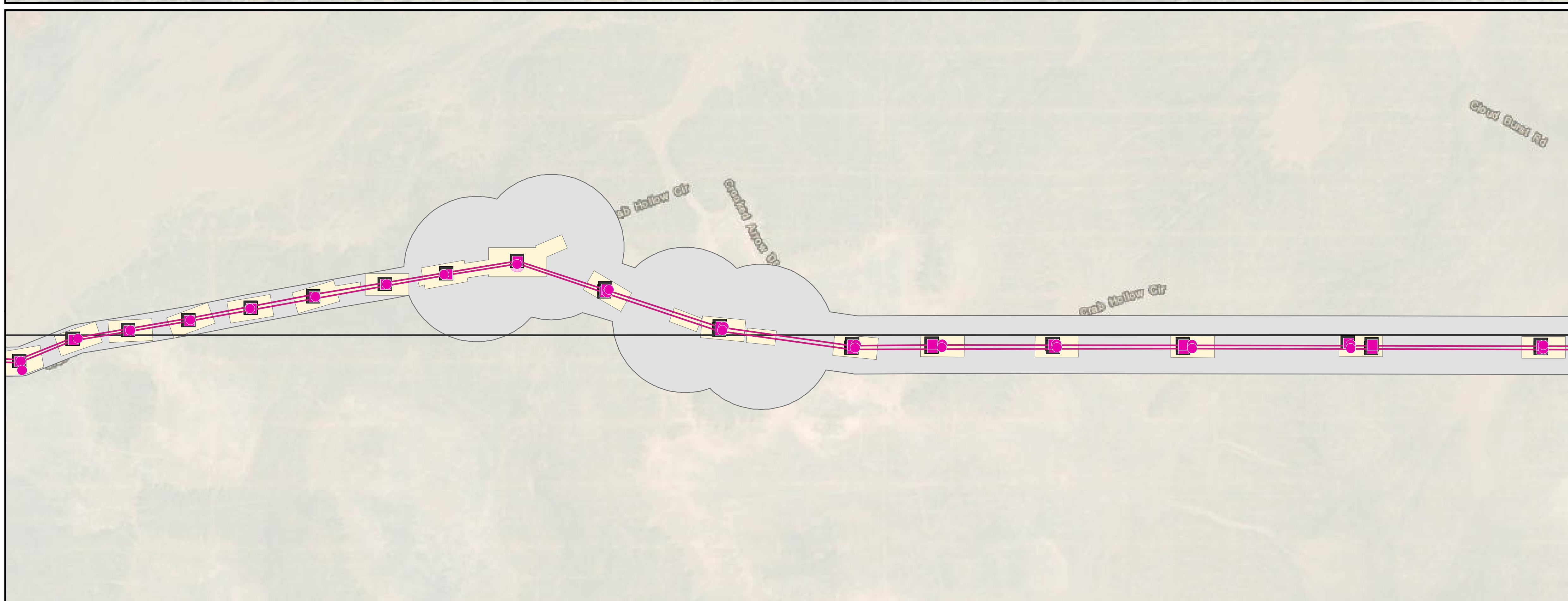
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

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Insignia Environmental

Feet
0 200 400

Figure N-1:
Project Comparison Map
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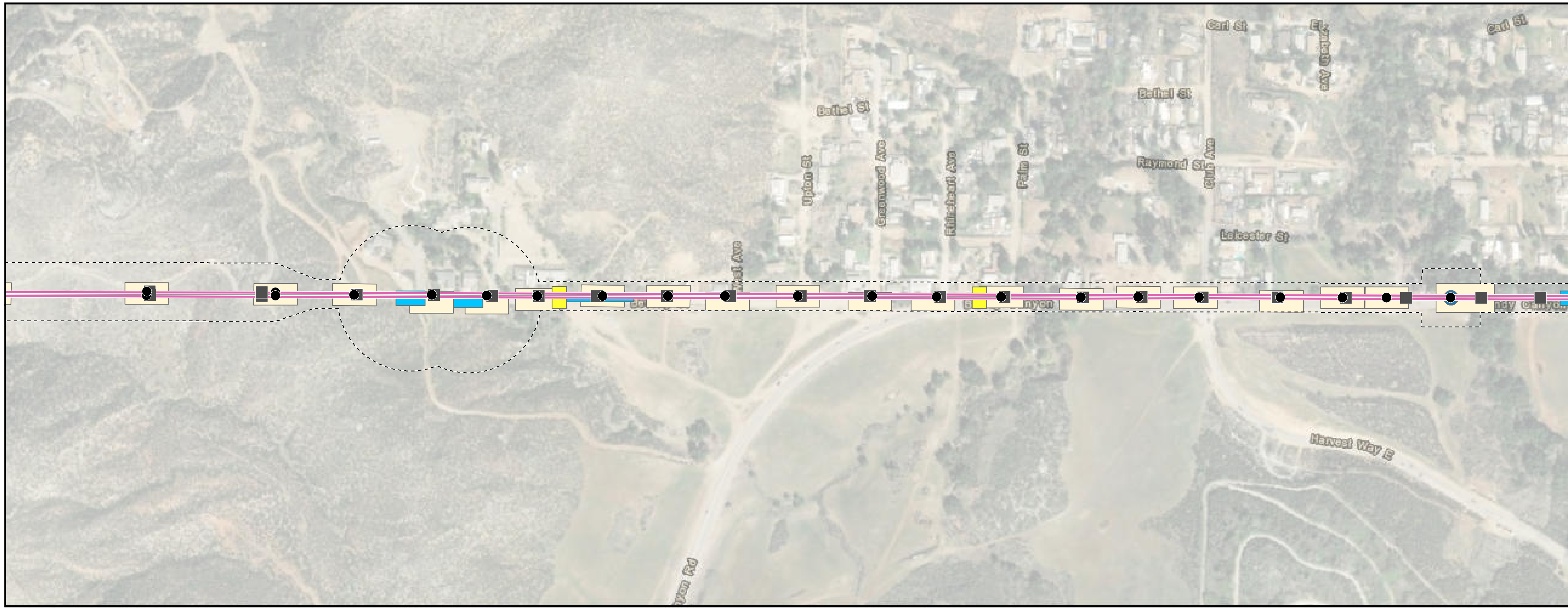
Alberhill System Project



Proposed Project Design

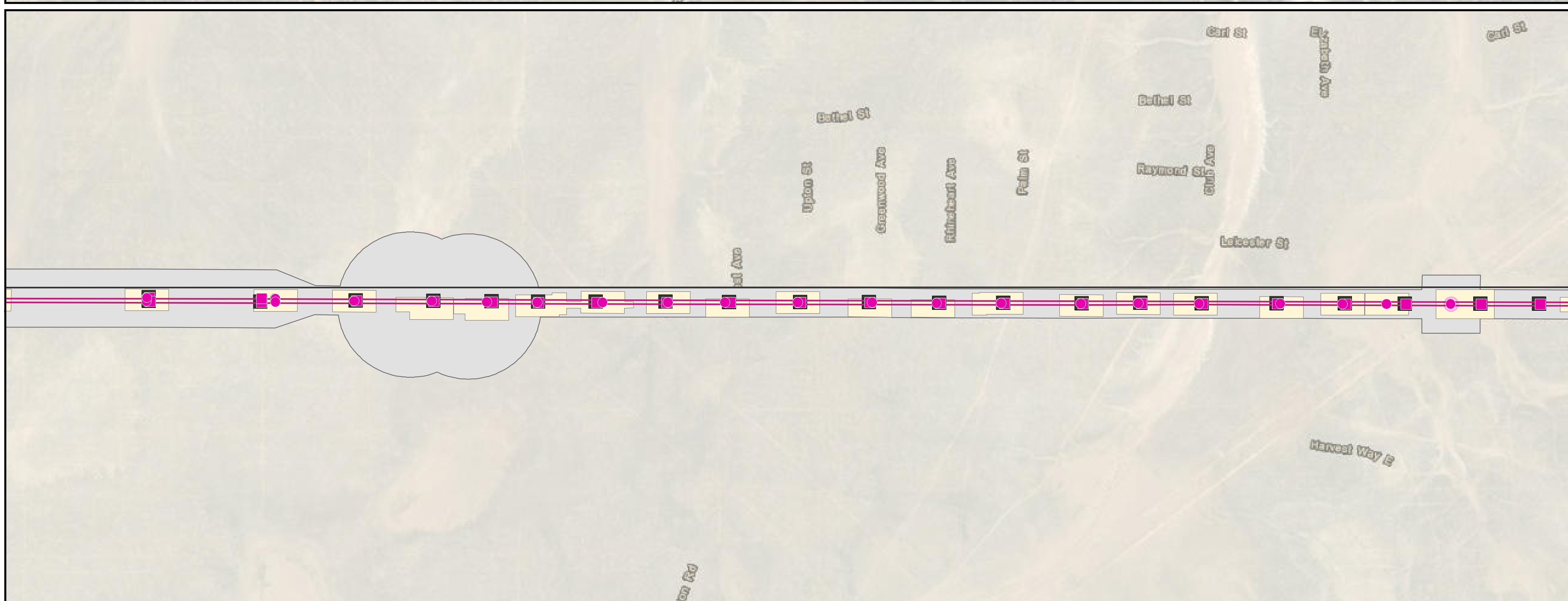
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

Feet
0 200 400

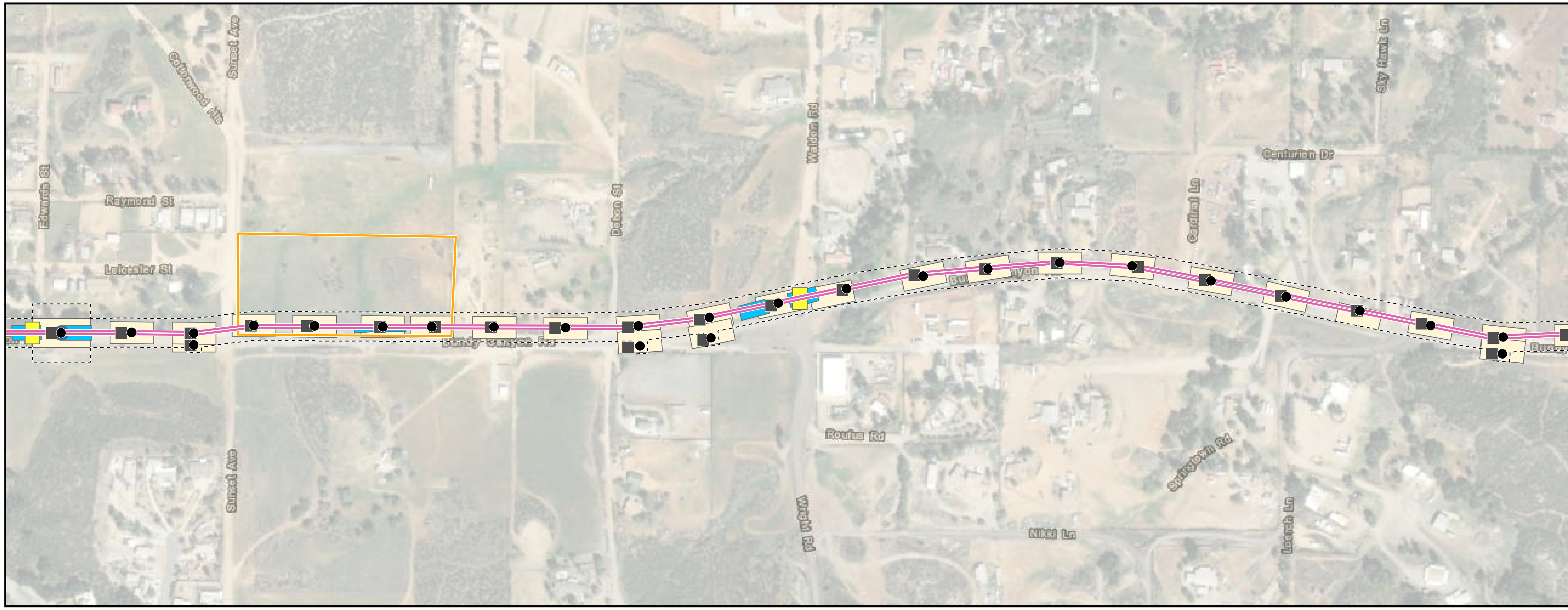


Figure N-1: Project Comparison Map

Alberhill System Project

Proposed Project Design

- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M

FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

Feet
0 200 400

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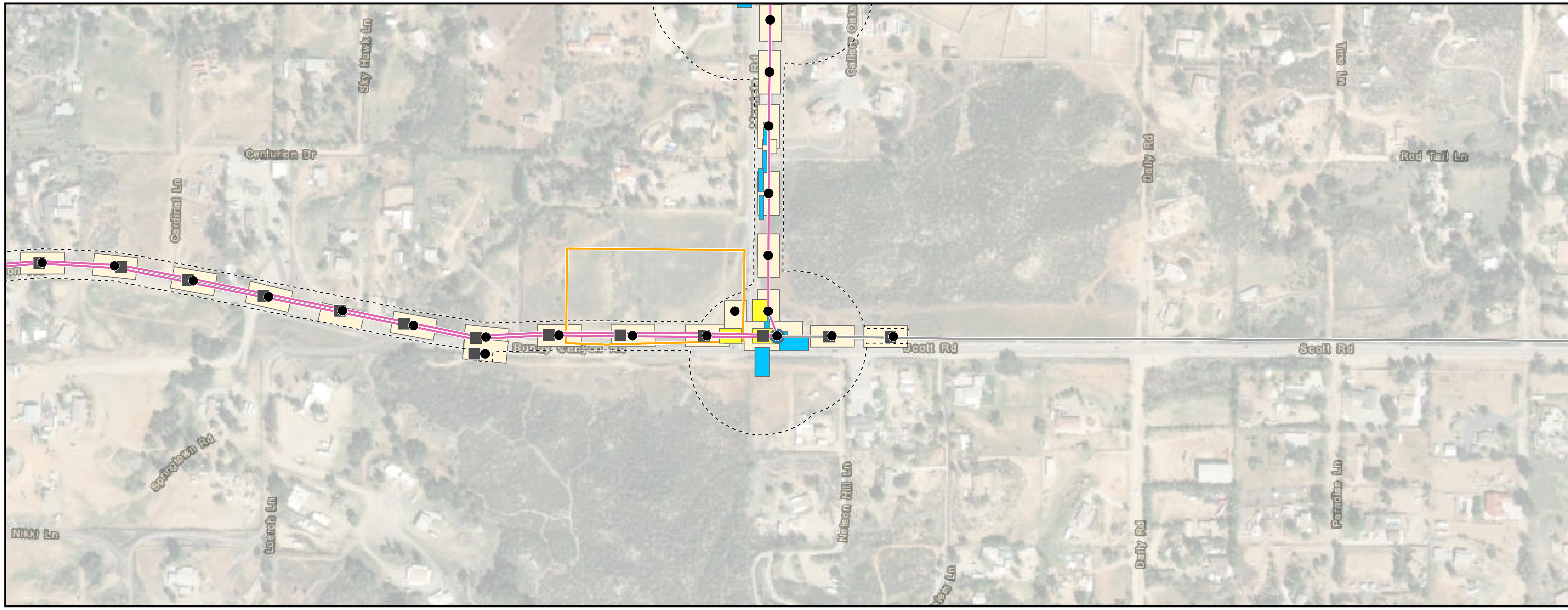
Figure N-1:
Project Comparison Map
28 of 39

Alberhill System Project



Proposed Project Design

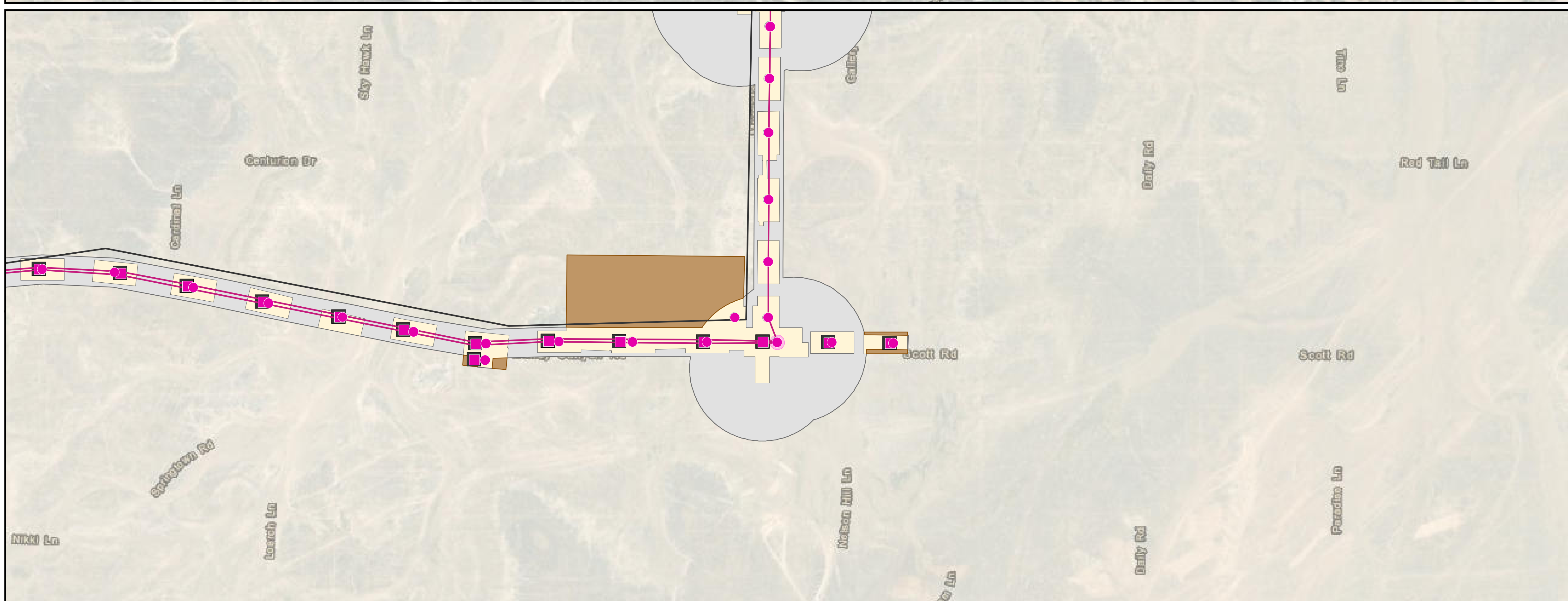
- New 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- Staging Area
- 115 kV General Disturbance Area

Permanent

- O&M



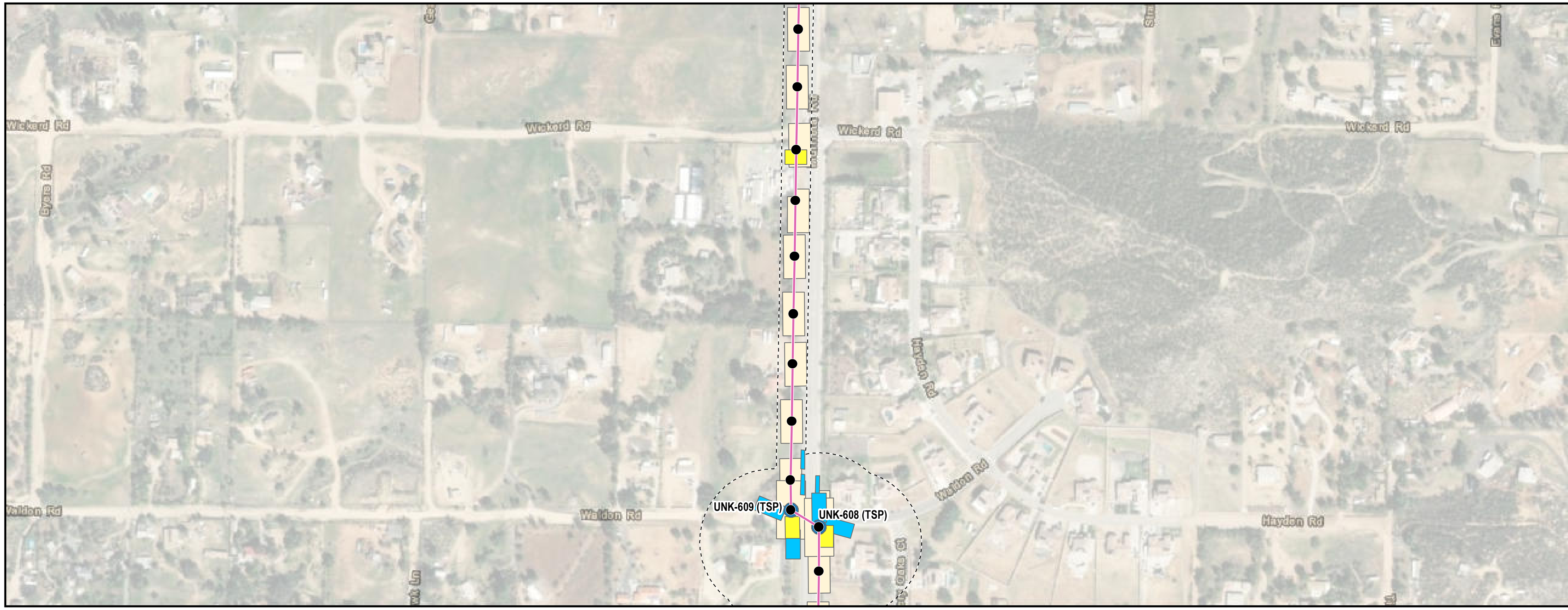
FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

Feet
0 200 400

Figure N-1: Project Comparison Map

Alberhill System Project



Proposed Project Design

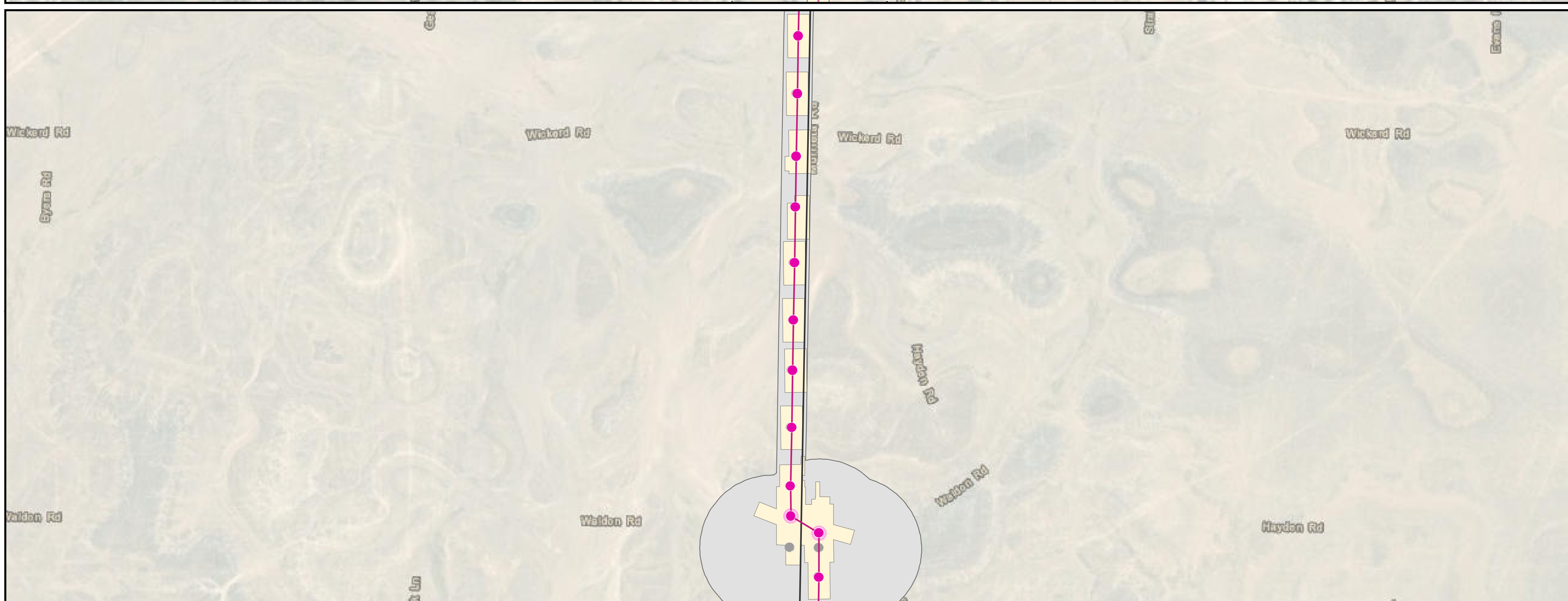
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

Feet
0 200 400

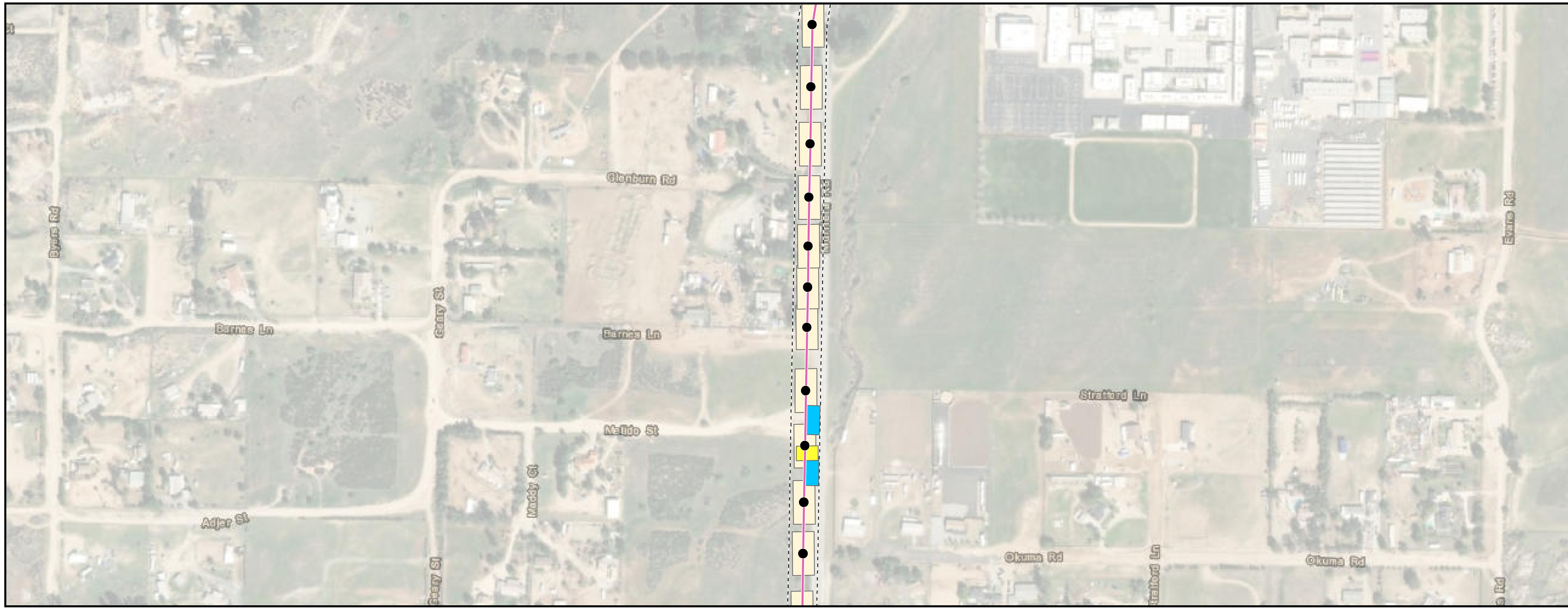


Figure N-1: Project Comparison Map

Alberhill System Project

Proposed Project Design
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent
- O&M

FEIR Design vs Proposed Project Design
- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company

INSIGNIA ENVIRONMENTAL

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0 200 400 Feet

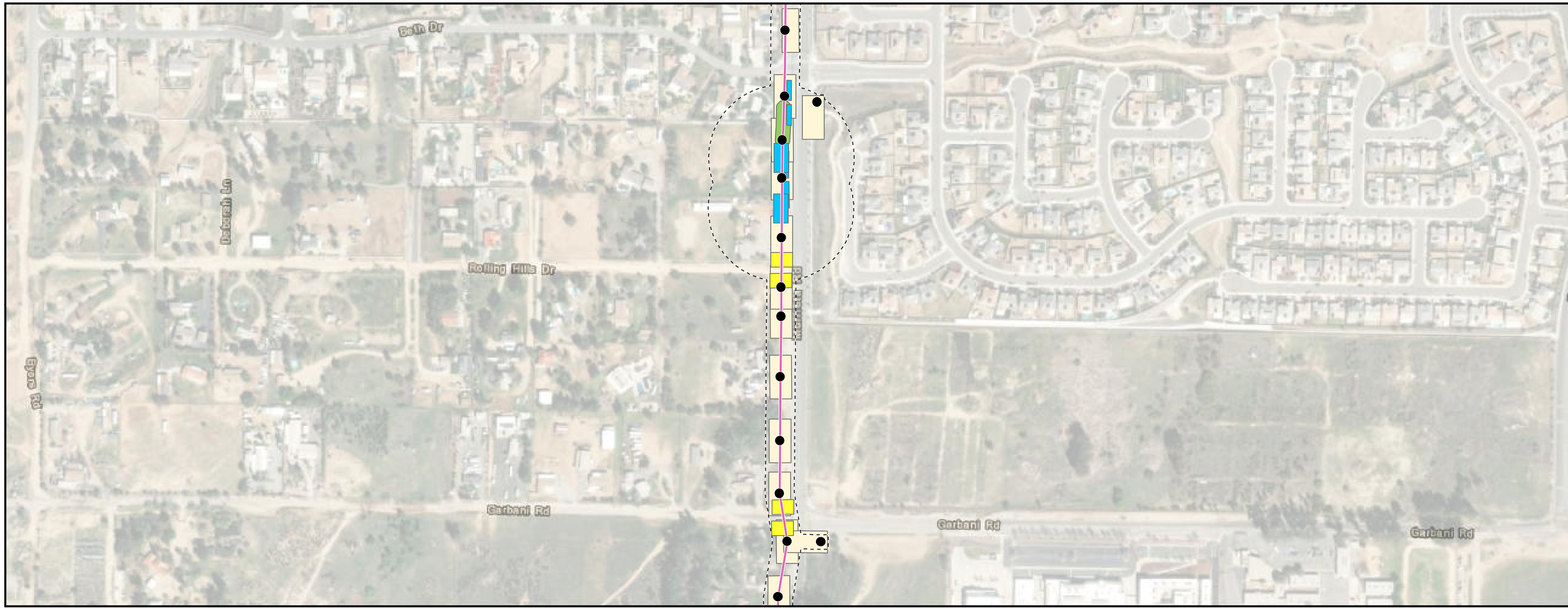


Figure N-1: Project Comparison Map

Alberhill System Project

Proposed Project Design

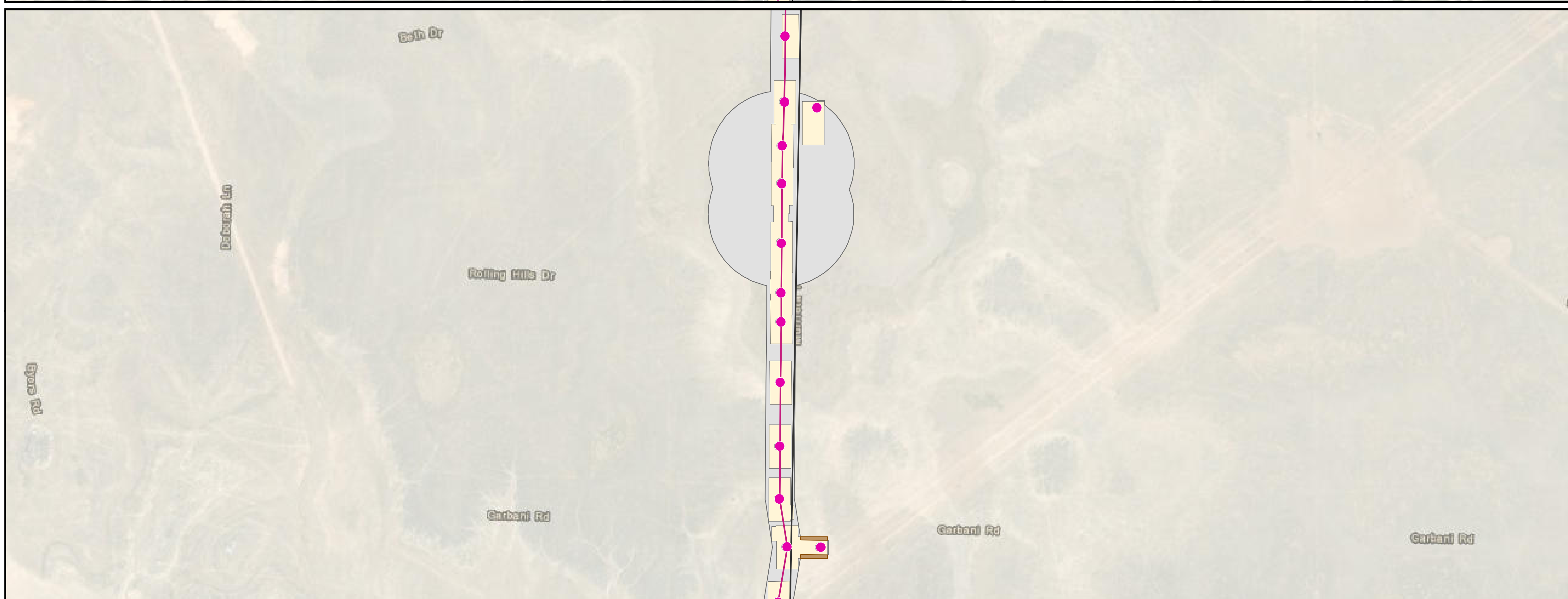
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

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INSIGNIA ENVIRONMENTAL

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Feet 0 200 400

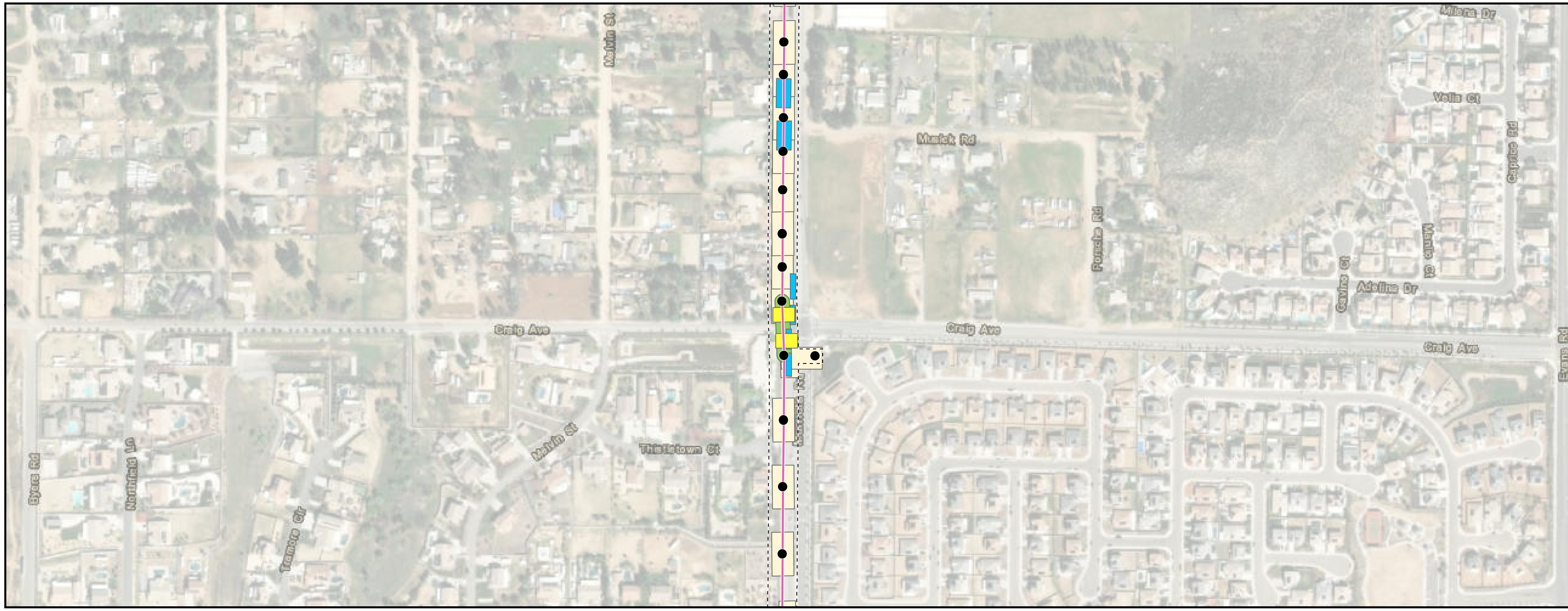

Figure N-1: Project Comparison Map

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Alberhill System Project

Proposed Project Design

- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Construction/Disturbance Area
- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M

FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

SOUTHERN CALIFORNIA EDISON
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INSIGNIA ENVIRONMENTAL

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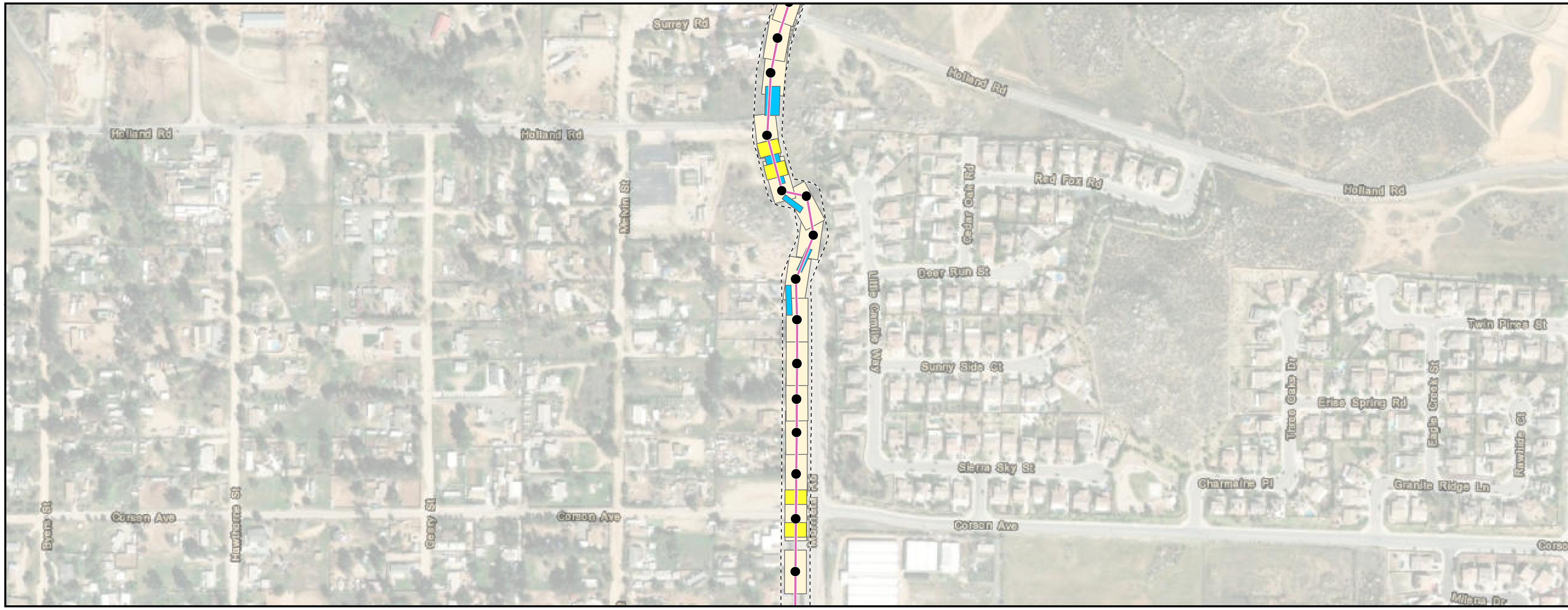


Figure N-1: Project Comparison Map

Alberhill System Project

Proposed Project Design

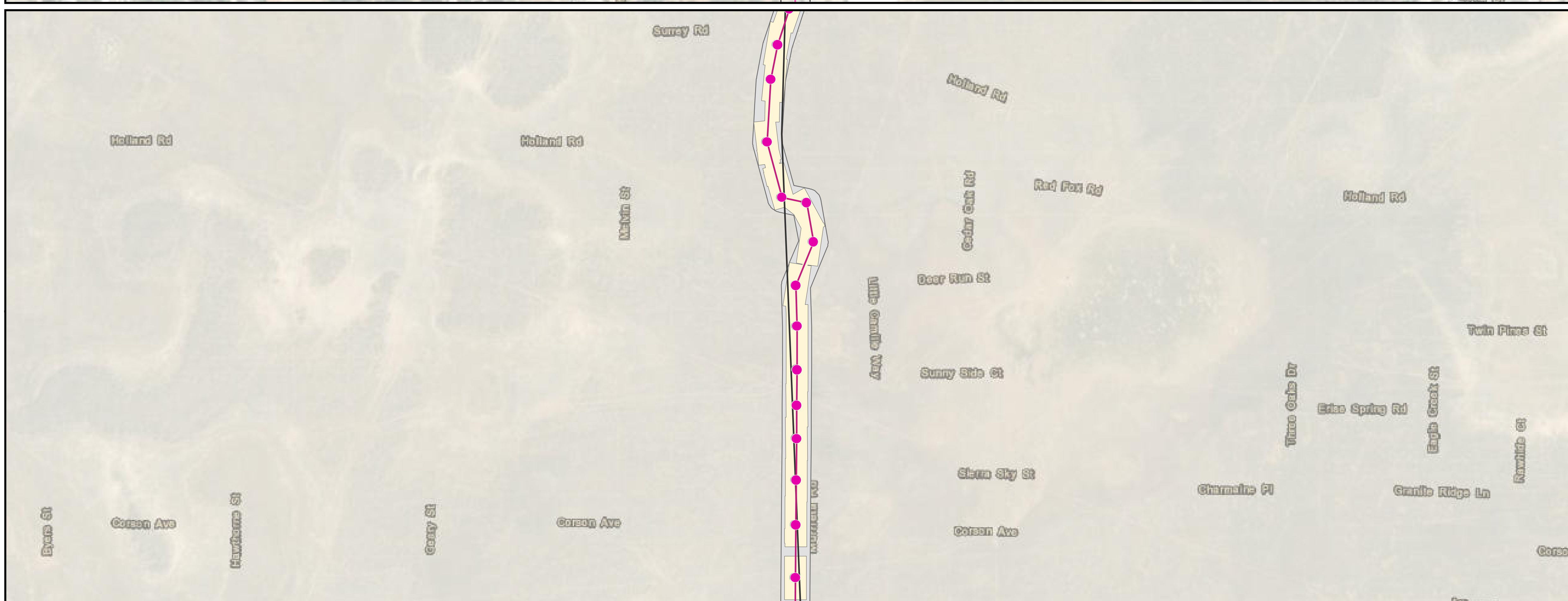
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



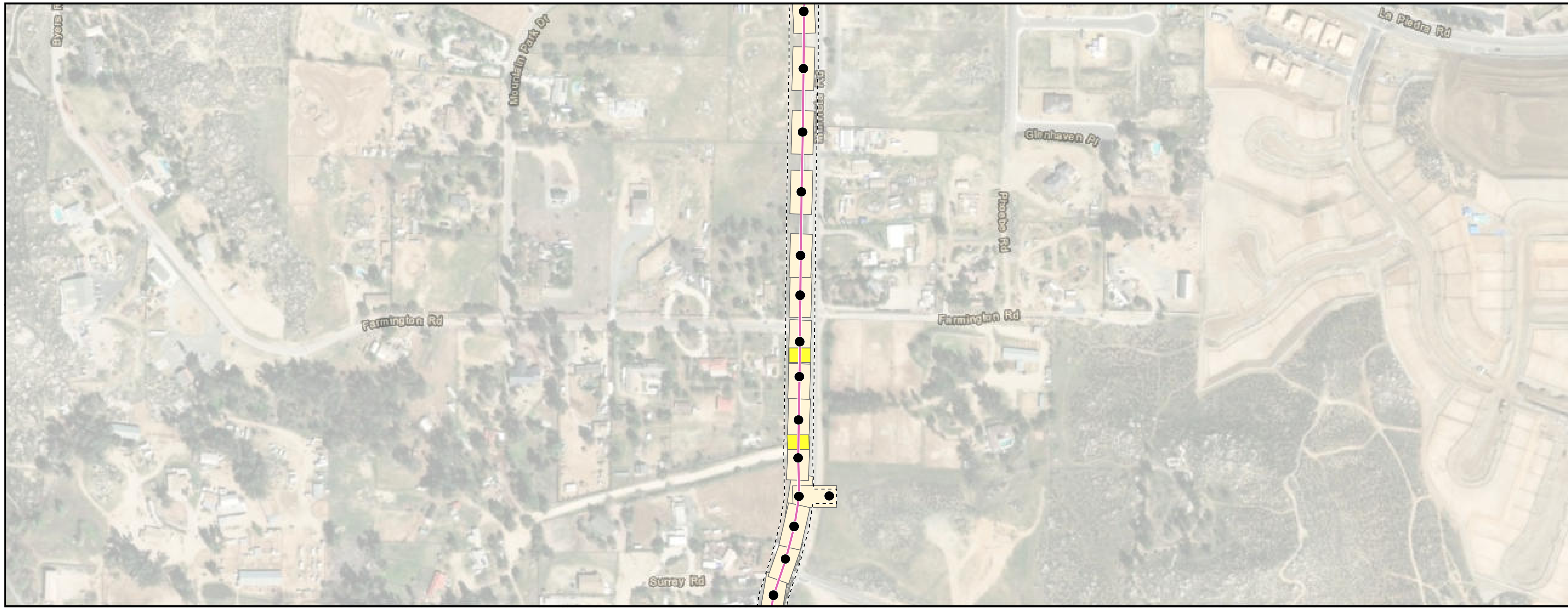
FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- No Change

Feet
0 200 400

Figure N-1: Project Comparison Map

Alberhill System Project



Proposed Project Design

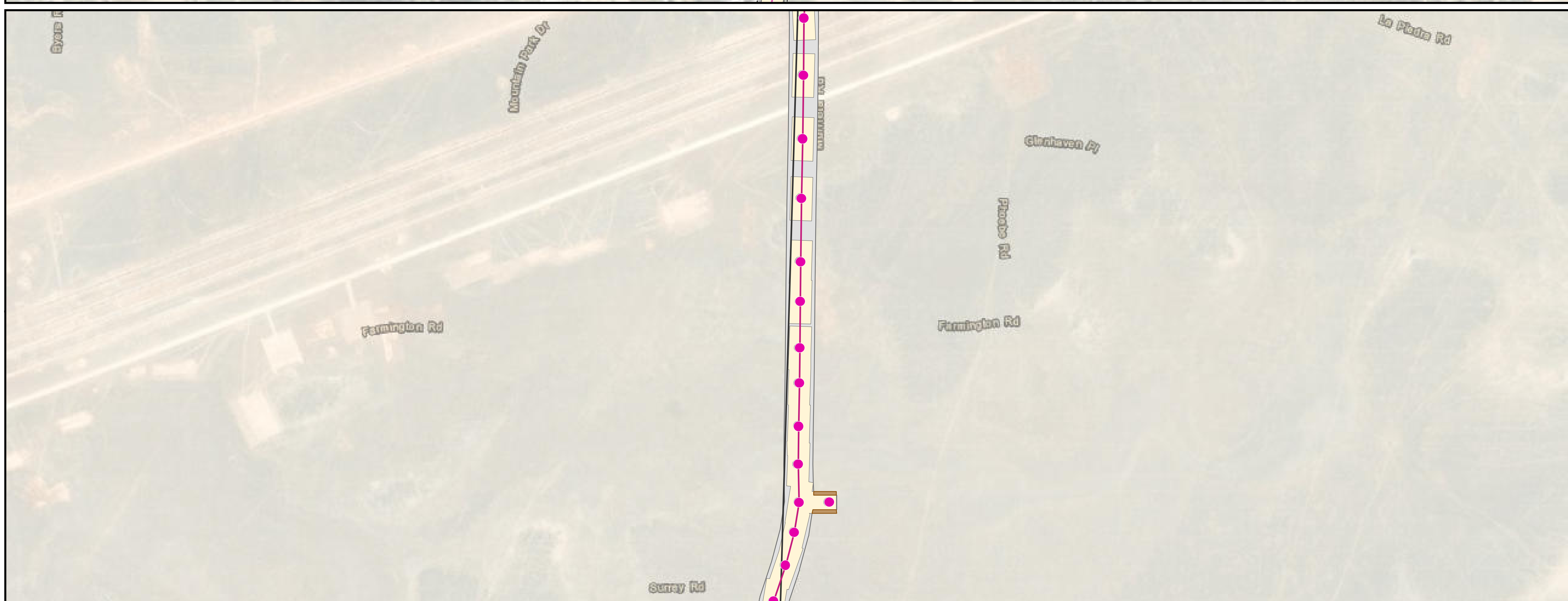
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Guard Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

Feet
0 200 400

Figure N-1: Project Comparison Map
35 of 39

Alberhill System Project

Proposed Project Design

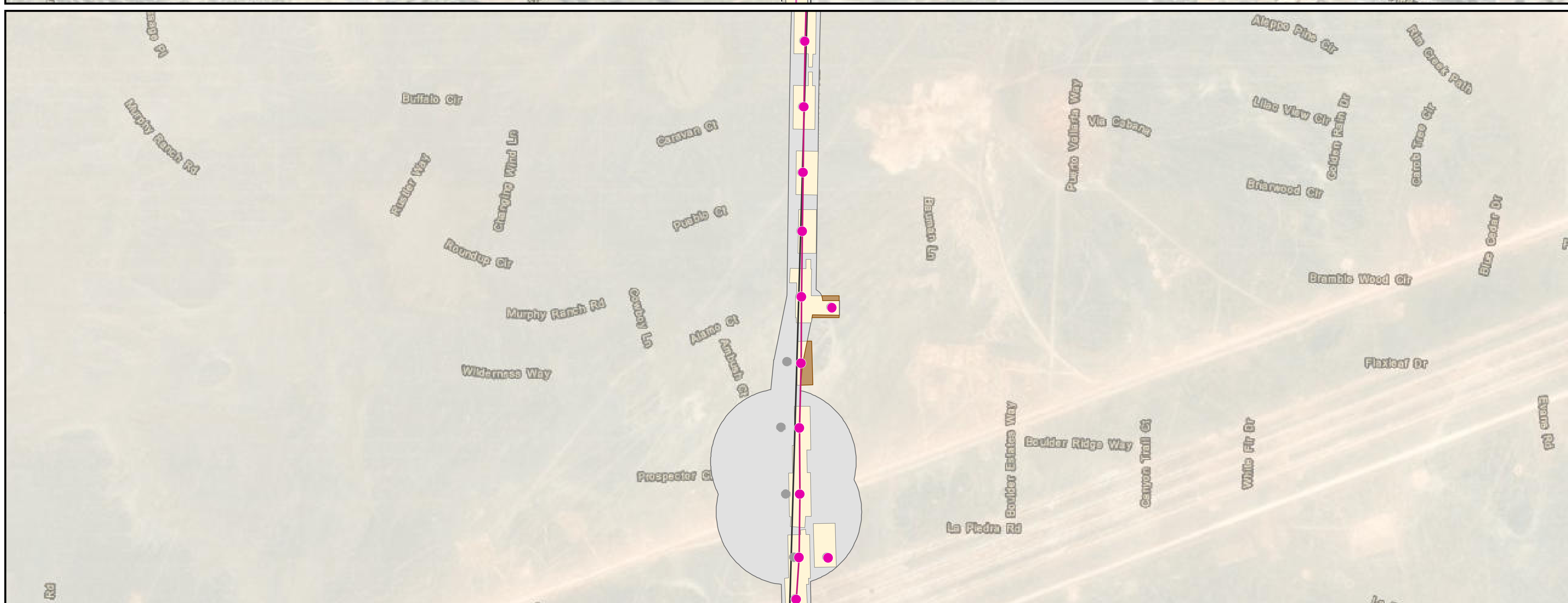
- New 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line

Temporary

- Guard Site
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

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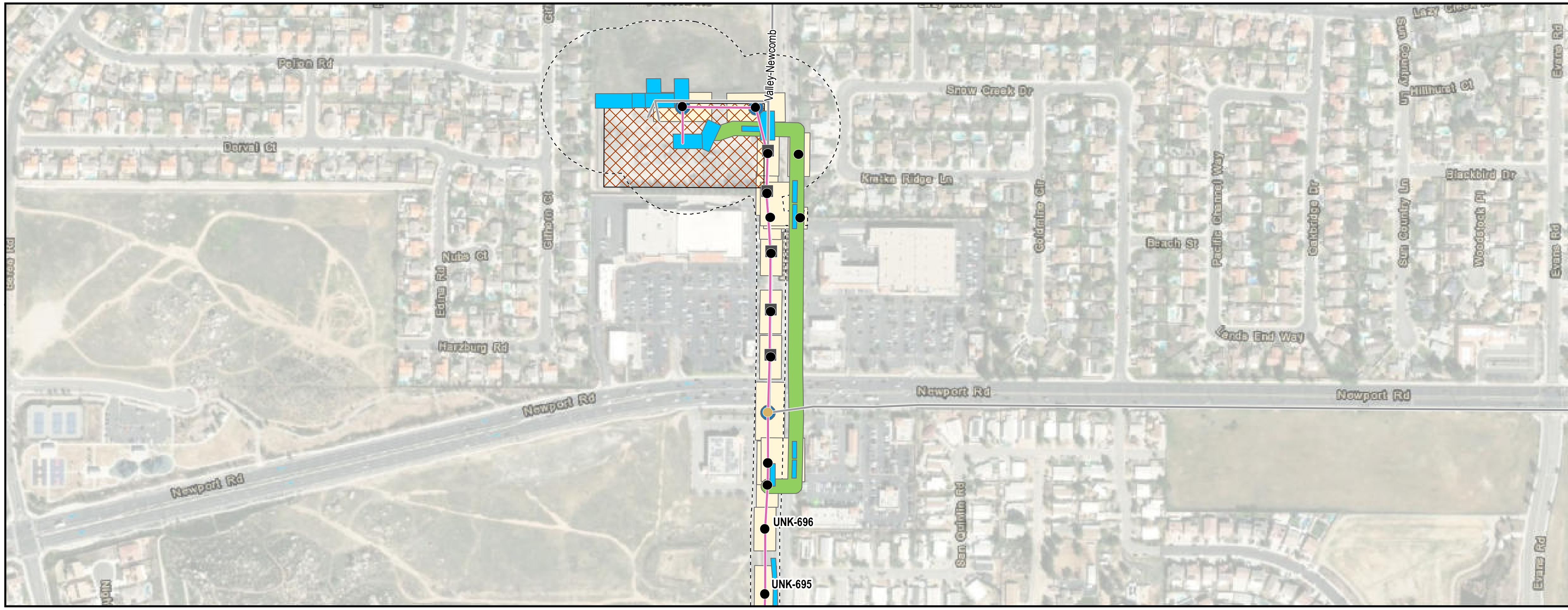
INSIGNIA ENVIRONMENTAL

N

0 200 400 Feet

Figure N-1: Project Comparison Map

Alberhill System Project

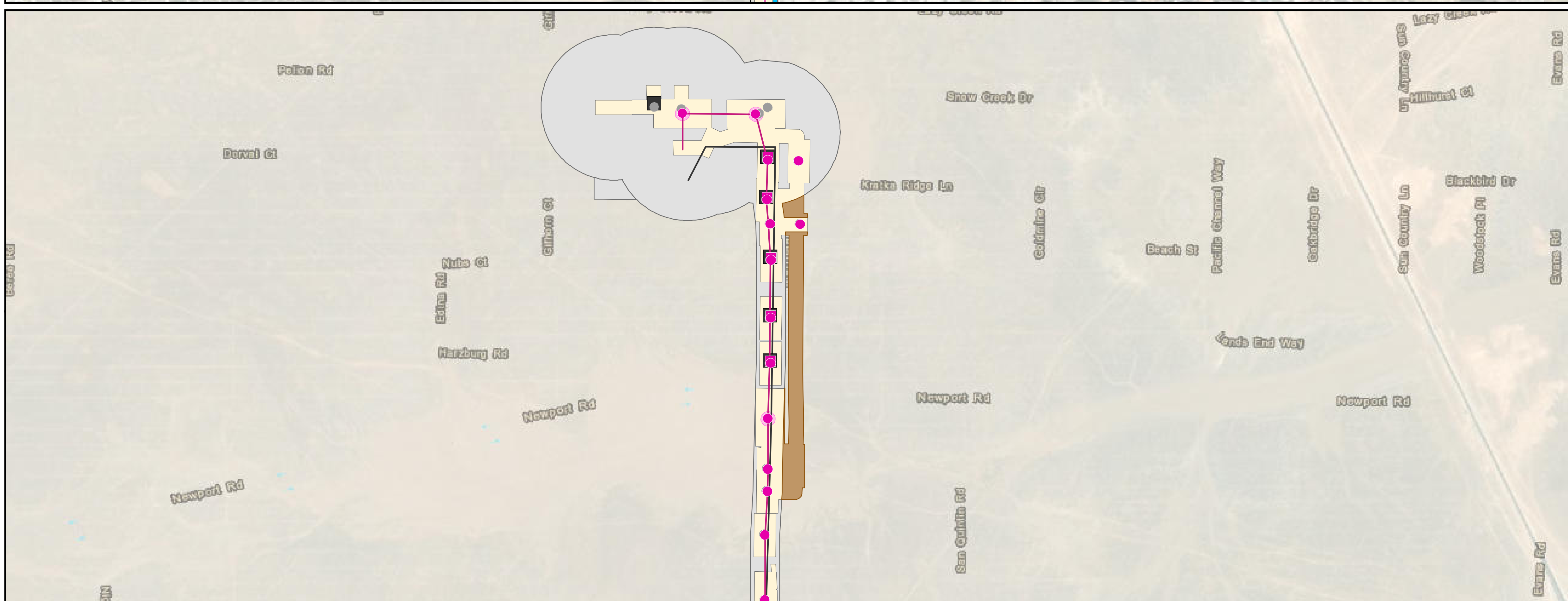


Proposed Project Design
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- Proposed Overhead 115 kV Subtransmission Line
- Existing Overhead 115 kV Overhead Line

Temporary
- Construction/Disturbance Area
- Pull Site
- Structure Work Area
- 115 kV General Disturbance Area

Permanent
- O&M

No Impact
- Fence



FEIR Design vs Proposed Project Design
- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Proposed Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR ASP 115 kV Pole to Remove
- FEIR Proposed Overhead 115 kV Subtransmission Line
- Defined Permanent Impact
- Defined Temporary Impact
- New Temporary Impact
- No Change

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INSIGNIA ENVIRONMENTAL

Feet
0 200 400

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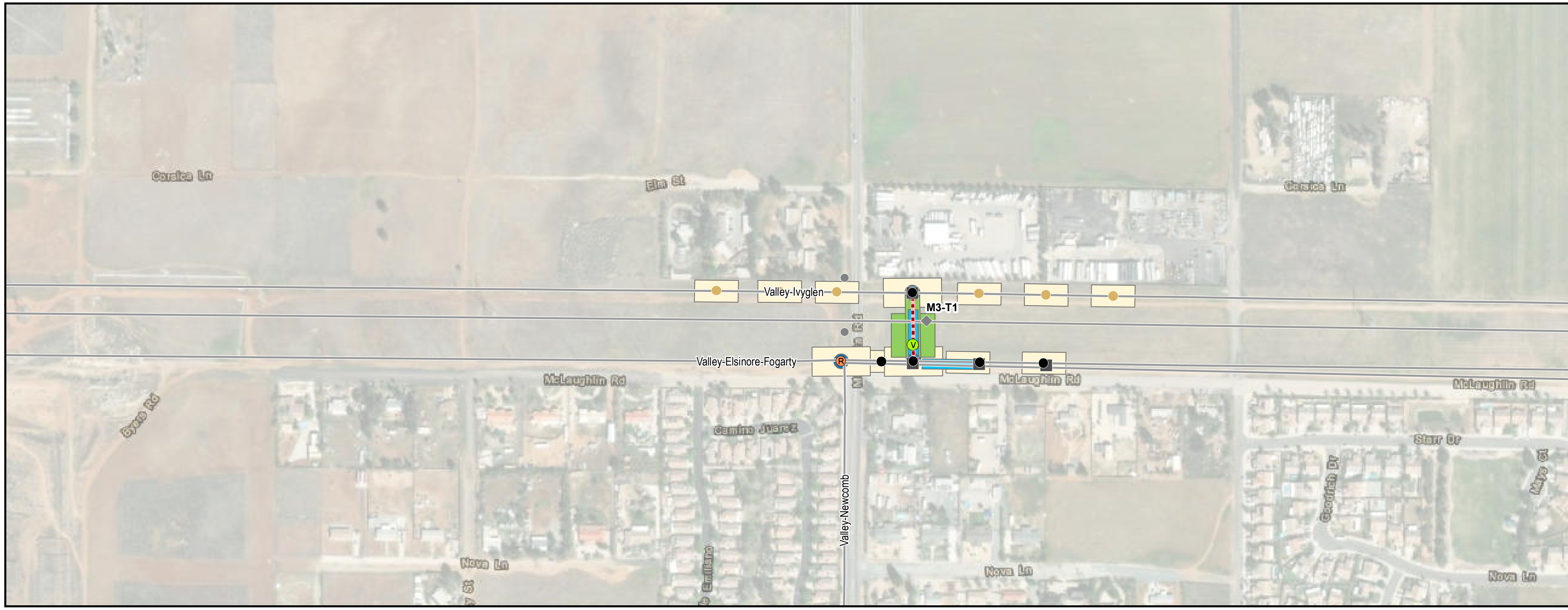
Figure N-1:
Project Comparison Map

Alberhill System Project



Proposed Project Design

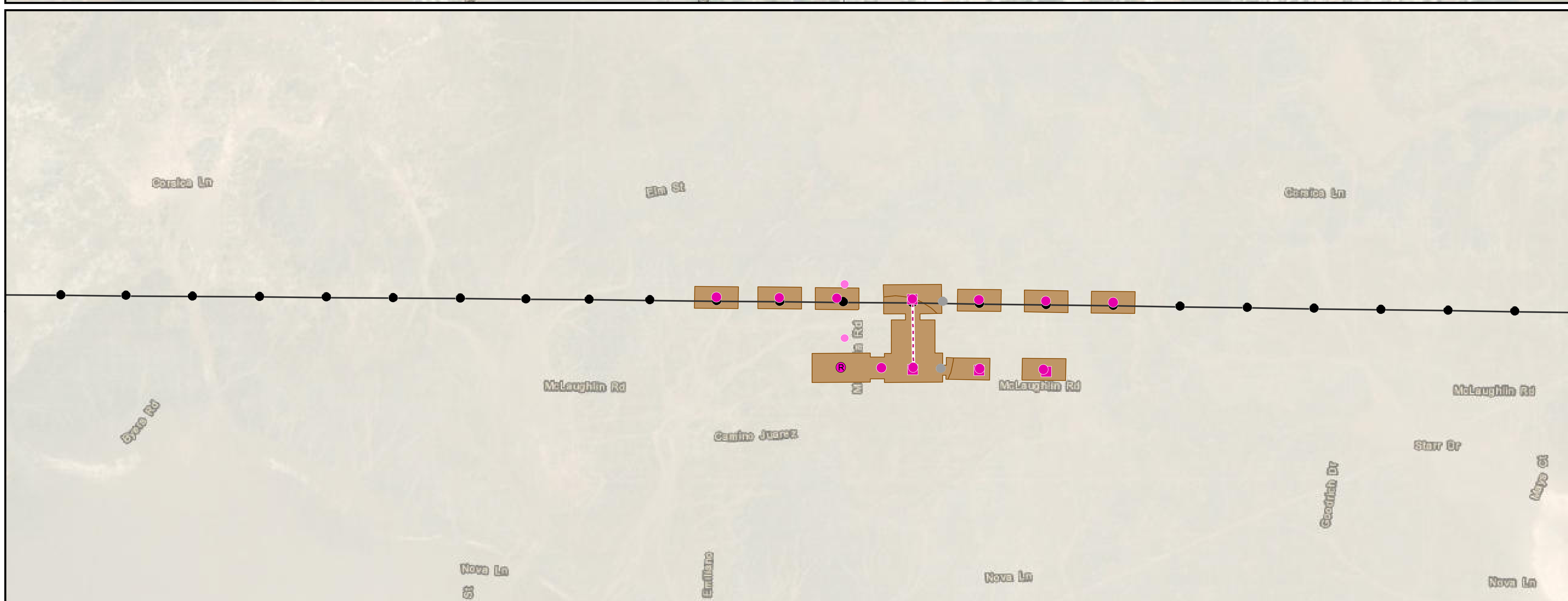
- Existing 500 kV Tower
- New 115 kV Pole/Structure
- Modify 115 kV Pole/Structure
- Existing 115 kV Pole/Structure
- Replace 115 kV Pole/Structure
- Remove 115 kV Pole/Structure
- New 115 kV Underground Vault
- Existing Overhead Serrano-Valley 500 kV Transmission Line
- Proposed 115 kV Cable in New Underground Duct Bank
- Existing Overhead 115 kV Overhead Line

Temporary

- Construction/Disturbance Area
- Pull Site
- Structure Work Area

Permanent

- O&M



FEIR Design vs Proposed Project Design

- Final New 115 kV Pole/Structure
- Final Modify 115 kV Pole/Structure
- Final Existing 115 kV Pole/Structure
- Final Replace 115 kV Pole/Structure
- Final Remove 115 kV Pole/Structure
- Final Underground Overhead 115 kV Subtransmission Line
- FEIR ASP 115 kV Pole
- FEIR VIG 115 kV Pole
- New Permanent Impact
- New Temporary Impact

Feet
0 200 400

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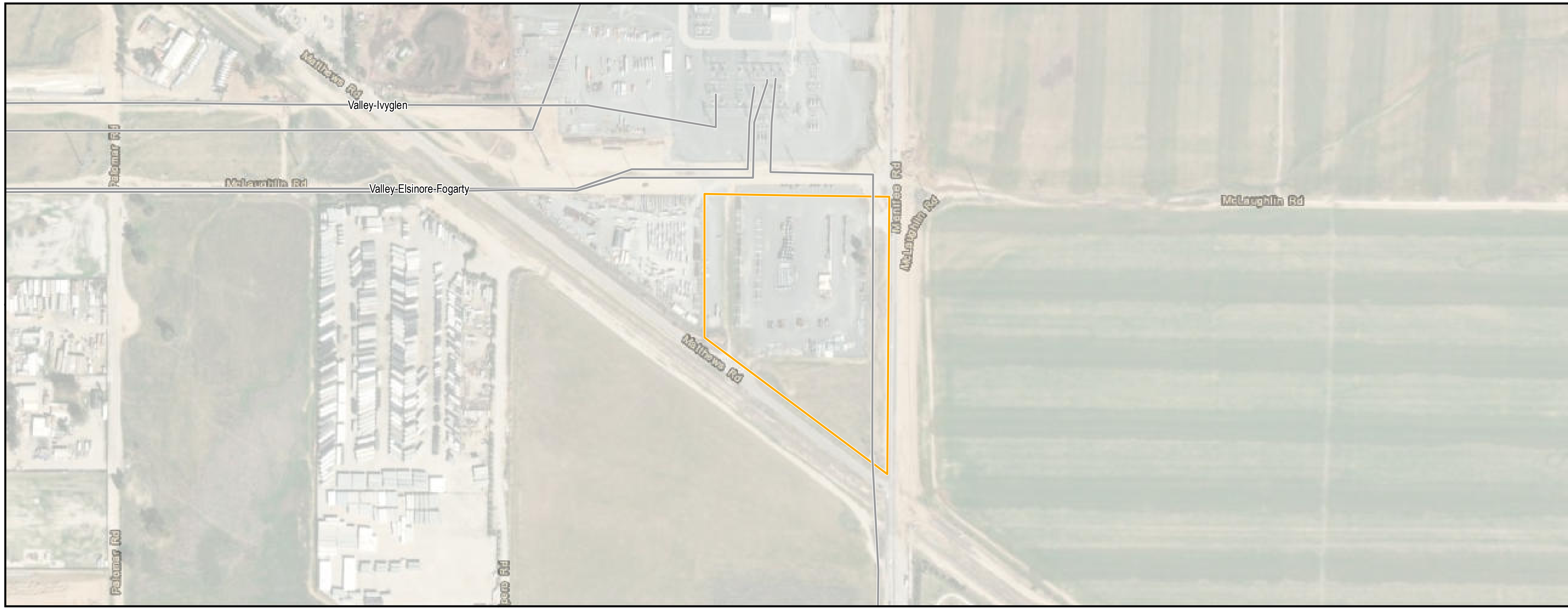
Figure N-1:
Project Comparison Map

Alberhill System Project

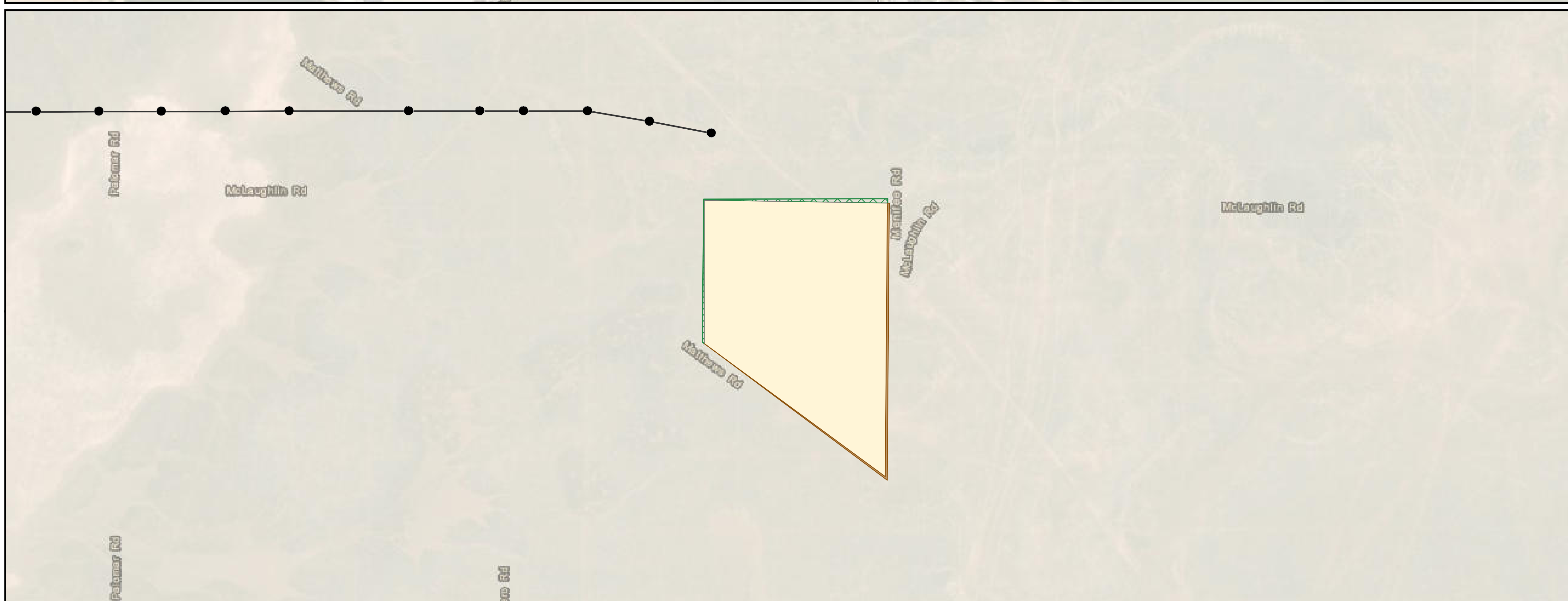


Proposed Project Design

- Existing Overhead Serrano-Valley 500 kV Transmission Line
- Existing Overhead 115 kV Overhead Line

Temporary

- Staging Area



FEIR Design vs Proposed Project Design

- FEIR VIG 115 kV Pole
- Defined Temporary Impact
- New Temporary Impact
- Removed from Project

Feet
0 200 400

Z:\Projects\SCE_Alberhill\Amended_PEA\MXD\Figures\Compare.mxd

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Figure N-1: Project Comparison Map

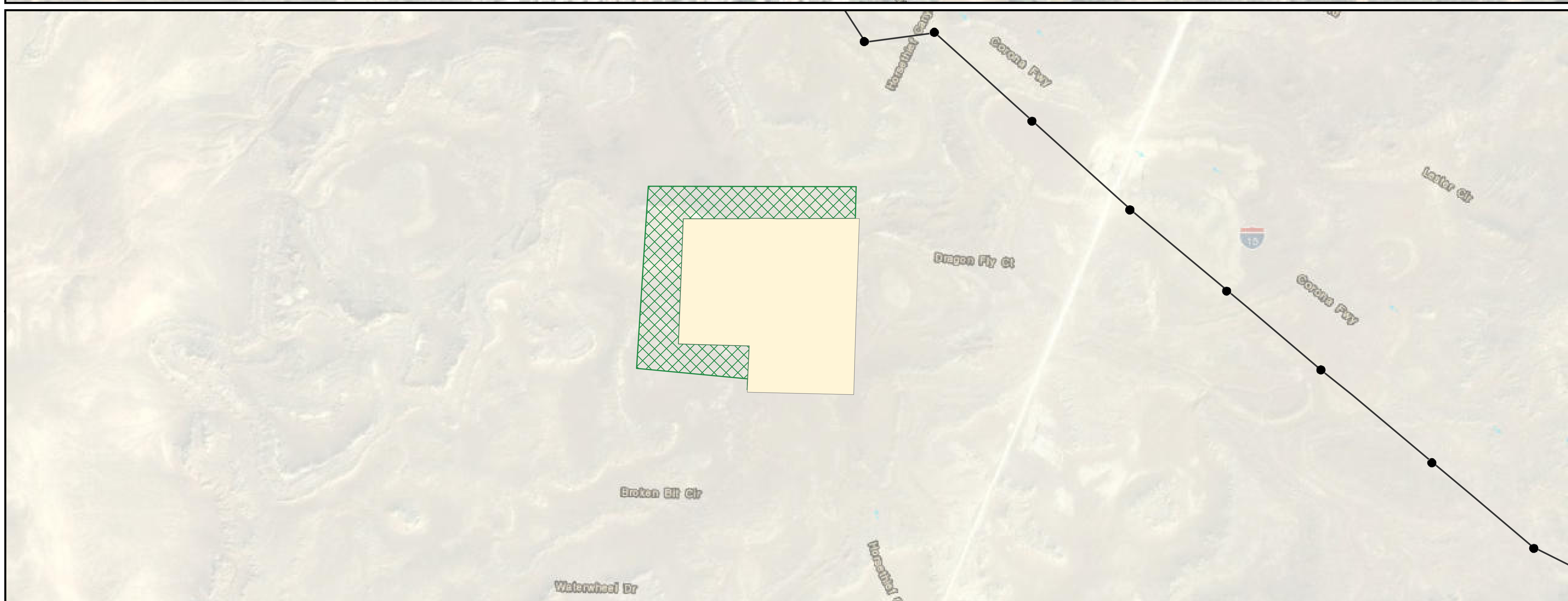
Alberhill System Project

Proposed Project Design

Existing Overhead 115 kV Overhead Line

Temporary

Staging Area



FEIR Design vs Proposed Project Design

FEIR VIG 115 kV Pole

Defined Temporary Impact

Removed from Project

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Feet
0 200 400

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