5.12 Noise

5.12.1 Environmental Setting

Fundamentals of Noise and Vibration

Noise is defined as unwanted and objectionable sound. Noise is measured in terms of sound-pressure level using units called decibels (dB). The most common system used by regulatory bodies for noise measurement is the A-weighted decibel scale. The A-weighted decibel (dBA) scale measures sound as an approximation of how a person perceives or hears it. Since the range of intensities that the human ear can detect is large, sound is measured using a logarithmic scale. The scale is based on multiples of 10 and each interval of 10 decibels indicates a sound energy 10 times greater, which is perceived by the human ear roughly twice as loud. Table 5.12-1 contains definitions of acoustical terms used in this analysis.

Table 5.12-1 Definition of Acoustical Terms

Term	Definition
Noise	Unwanted sound, which occurs as a rapid fluctuation of air pressure above and below the atmospheric pressure. There are two important characteristics of noise: frequency and loudness. The number of pressure variations per second is called the frequency of sound and is measured in Hertz. The higher the frequency, the more high-pitched a sound is perceived to be. Loudness is measured in decibels, which are defined herein.
Decibel	Noise is measured in terms of sound-pressure level using units called decibels (dB). Since the range of intensities that the human ear can detect is large, the logarithmic scale is based on multiples of 10. Each interval of 10 dB indicates a sound energy 10 times greater. Each interval is perceived by the human ear as being roughly twice as loud.
A-weighted decibel (dBA)	The most common system used by regulatory bodies for noise measurement is the A-weighted decibel (dBA) scale. This scale measures sound as an approximate to how a person perceives or hears sound. A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}).
Equivalent sound pressure level (L_{eq})	A single value of sound level for any desired duration, which includes all of the time-varying sound energy in the measurement period. Sound levels are usually best represented by an equivalent level over a given time period (L_{eq}) or by an average level occurring over a 24-hour day-night period (L_{dn}).
Statistical noise measurement	Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L_{xx}, where xx represents the percentage of time the sound level is exceeded. For example, L_{90} represents the noise level exceeded during 90 percent of the measurement period. Similarly, L_{10} represents the noise level exceeded for 10 percent of the measurement period.
Day–night average sound level (L_{dn}) noise level	The L_{dn}, or day-night average sound level (DNL), is equal to the 24-hour A-weighted equivalent sound level that is weighted to account for differences in noise levels and the perception of noise during nighttime hours (10 p.m. to 7 a.m.). Most household noise also decreases at night, and exterior noise becomes more noticeable.

Source: EPA 1978.
Key:
dB = decibel
dBA = A-weighted decibel
DNL = day-night average sound level
L_{dn} = day-night average sound level
L_{eq} = equivalent sound pressure level

Sensitivity to noise is subjective and varies from person to person, with the particular setting, and with the time of day. Sensitivity to noise typically increases during the evening and nighttime hours, when excessive noise can interfere with at-home activities and the ability to sleep. To account for these

day/evening/night differences in sensitivity, 24-hour descriptors have been developed that incorporate artificial noise penalties, which are added to quiet-time noise events.

The day/night average sound level (Ldn) is a measure of the cumulative noise exposure in a community, with a 10-dB penalty applied to nighttime (i.e., 10:00 p.m. to 7:00 a.m.) noise levels. A similar 24-hour metric is the community noise equivalent level (CNEL), which extends the sensitivity adjustment beyond the Ldn by also applying a 5-dB addition to noise levels in the evening hours (7:00 p.m. to 10:00 p.m.).

Ambient Noise Levels in the Project Area

Noise levels in communities usually relate to the intensity of nearby human activity. Communities may be affected by noise from a variety of stationary and mobile sources that generate noise of varying intensities. Ambient noise levels are generally considered to be low at levels below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the L_{dn} is more likely to be around 50 to 60 dBA.

The general human response to changes in noise levels that are similar in frequency content (e.g., increases in continuous equivalent sound pressure level [L_{eq}] for traffic) are summarized as follows:

- A 3-dB change in sound level is considered barely perceptible.
- A 5-dB change in sound level would typically be noticeable.
- A 10-dB change in sound level would represent a doubling in loudness and would likely be perceived as noisy.

The existing overhead utility lines associated with the proposed project are within the cities of San Diego and Del Mar. Ambient noise sources in each jurisdiction are described as follows:

- **City of San Diego:** characterized as a developed and urbanized city. Motor vehicle traffic on interstate freeways, state highways, and local major roads are the most prevalent noise sources. Other contributors to the city's noise environment are aircraft noise, rail traffic, and industrial and commercial activities (City of San Diego 2015).
- **City of Del Mar:** characterized as a small residential community in the coastal fringe of San Diego. Mobile sources of noise from trains and motor vehicle traffic on Camino del Mar are the most prevalent noise sources. Noise from trains is periodic, and noise from motor vehicle traffic is relatively constant (City of Del Mar 1976).

The typical noise level in agricultural and rural-residential areas is approximately 30 dBA. The typical noise level in urban areas is between 60 and 70 dBA (Caltrans 2013).

Attenuation of Noise

A person's distance from a noise source and presence of physical barriers affects how noise levels attenuate (decrease). Transportation noise sources tend to be arranged linearly, such that roadway traffic noise attenuates at a rate of 3 to 4.5 dBA per doubling of distance from the source. Point sources of noise,

including stationary, fixed, and idle mobile sources, like idling vehicles or construction equipment, may attenuate at rates of 6.0 dBA to 7.5 dBA per doubling of distance from the source, depending on the type of intervening ground surface and vegetation (HUD 1985). Meaningful attenuation of noise levels can also be accomplished by "shielding" or by providing a barrier, which may be in the form of an intervening structure or terrain. Buildings adjacent a roadway may shield people from traffic noise, with closely spaced buildings providing about 5.0 dBA of reduction (Caltrans 2013).

Vibration

Vibration is a change in pressure that at certain levels may be perceived as a nuisance. As with noise, vibration can be described by its amplitude and frequency. Amplitude may be characterized by displacement, velocity, and/or acceleration. Frequency of vibration can also change human perception—usually the longer the event and the higher the frequency, the more adverse the effect on human response (Caltrans 2013). Vibration can be felt outdoors, but the perceived intensity of vibration impacts is much greater indoors due to the shaking of structures. Human response to vibration is difficult to quantify, and vibration can be perceived at levels that are below those required to produce any damage on structures. Typically, perception and annoyance are higher for transient rather than for continuous vibration. Typical background vibration from common sources, like roads, in a residential area is 50 vibration decibels (VdB), 15 VdB below the human threshold of perception (FTA 2006).

Sensitive Receptors in the Project Area

Noise- and vibration-sensitive receptors are land uses where an excessive amount of noise would interfere with normal activities. For noise, sensitive receptors may entail primarily residences, hospitals, religious congregations, schools and libraries, nature and wildlife preserves, and parks. In addition to these land uses, research laboratories are also sensitive to groundborne vibration. For the purposes of this analysis, the project study area for sensitive receptors is 1,000 feet from all project components. Within this 1,000-foot sensitive receptor area are ~~three~~ five schools, 14 residences, ~~and~~ eight parks, and one private educational facility. No churches, religious organizations or known research laboratories are present within 1,000 feet of a project component. Figure 5.12-1 shows all sensitive receptors within 1,000 feet of the project area and highlights the nearest school, Del Mar Hills Elementary School (approximately 27 feet), and nearest residence (approximately 35 feet). Table 5.12-2 lists all noise-sensitive receptors within 1,000 feet of the proposed project.

Table 5.12-2 Noise-Sensitive Receptors within 1,000 Feet of Project Components

Project Component/Activity	Nearest Sensitive Receptor (feet)	Receptor
TL674A Reconfiguration		
New 69 kV Underground TL674A	355	Residence
Overhead Line to be Removed 69 kV TL674A	115	Residence
~~Work Area - TL674A (WA-2)~~ TL674A Underground Work Area	~~283~~ 75	~~Solano Santa Fe Elementary School~~ Therapeutic Learning Center

Table 5.12-2 Noise-Sensitive Receptors within 1,000 Feet of Project Components

Project Component/Activity	Nearest Sensitive Receptor (feet)	Receptor
TL666D Removal		
Drop Zone EL666D	107	Residence
Overhead 69 kV TL666D to be removed	Many features overlap	Peñasquitos Lagoon Open Space
Overhead 69 kV TL666D to be removed	Many features overlap	Los Peñasquitos Marsh Nature Preserve
Stringing Site TL666D SS-15	35	Residence
Stringing Site TL666D SS-16	35	Residence
Stringing Site TL666D SS-17	55	Residence
Stringing Site TL666D SS-18	52	Residence
Stringing Site TL666D SS-2	11	Residences
Stringing Site TL666D SS-25	82	Residence
Stringing Site TL674A SS-28	295	Residence
Work Area TL666D (WA-11)	822	Surf and Turf Recreational Park
Work Area TL666D (WA-44)	41	Residence
Work Area TL666D (WA-5)	79	Residence
Work Area TL666D (WA-59)	27	Del Mar Hills Elementary School
Work Area TL666D (WA-67)	175	Del Mar Nursery School
Work Area TL666D (WA-100)	400	Brighter Future Preschool
Work Area TL666D (WA-102)	400	Child Development Center
C510 Conversion		
Existing 12kV Overhead	42	Residence
New 12 kV Underground C510	91	Residence
C738 Conversion		
Underground Work Area C738	445	Shaw Valley Open Space
Del Mar Substation		
Circuit Breaker Removal and Replacement	228	Therapeutic Learning Center
All		
Del Mar Heights Fly Yard	361	Del Mar Heights Elementary School
Pumpkin Patch Staging Yard	121	Fairbanks Ranch Country Club
Pumpkin Patch Staging Yard	123	Carmel Valley Open Space
Pumpkin Patch Staging Yard	145	Residence
Torrey Pines Fly Yard	102	Torrey Pines State Reserve
Torrey Pines Fly Yard	363	Torrey Pines State Beach
Torrey Pines Fly Yard	Features overlap	San Jacinto Wilderness

Key:
kV = kilovolt

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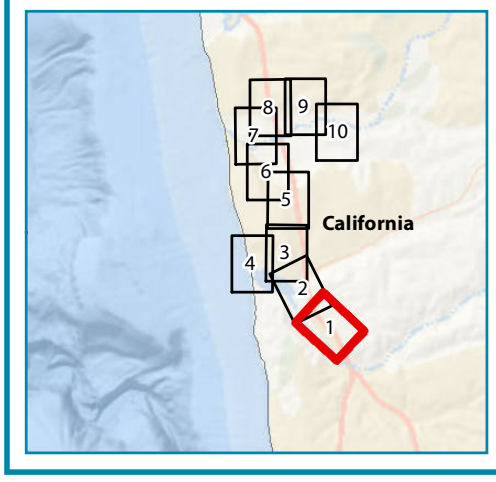

Proposed Project Components
- C738 Conversion
- TL666D Removal
- Drop Zone
- Stringing Site
- Work Area
- Temporary Footpath
- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal Project Overview Map
San Diego County, California
January 2019

0 500 1,000 Feet
0 150 300 Meters
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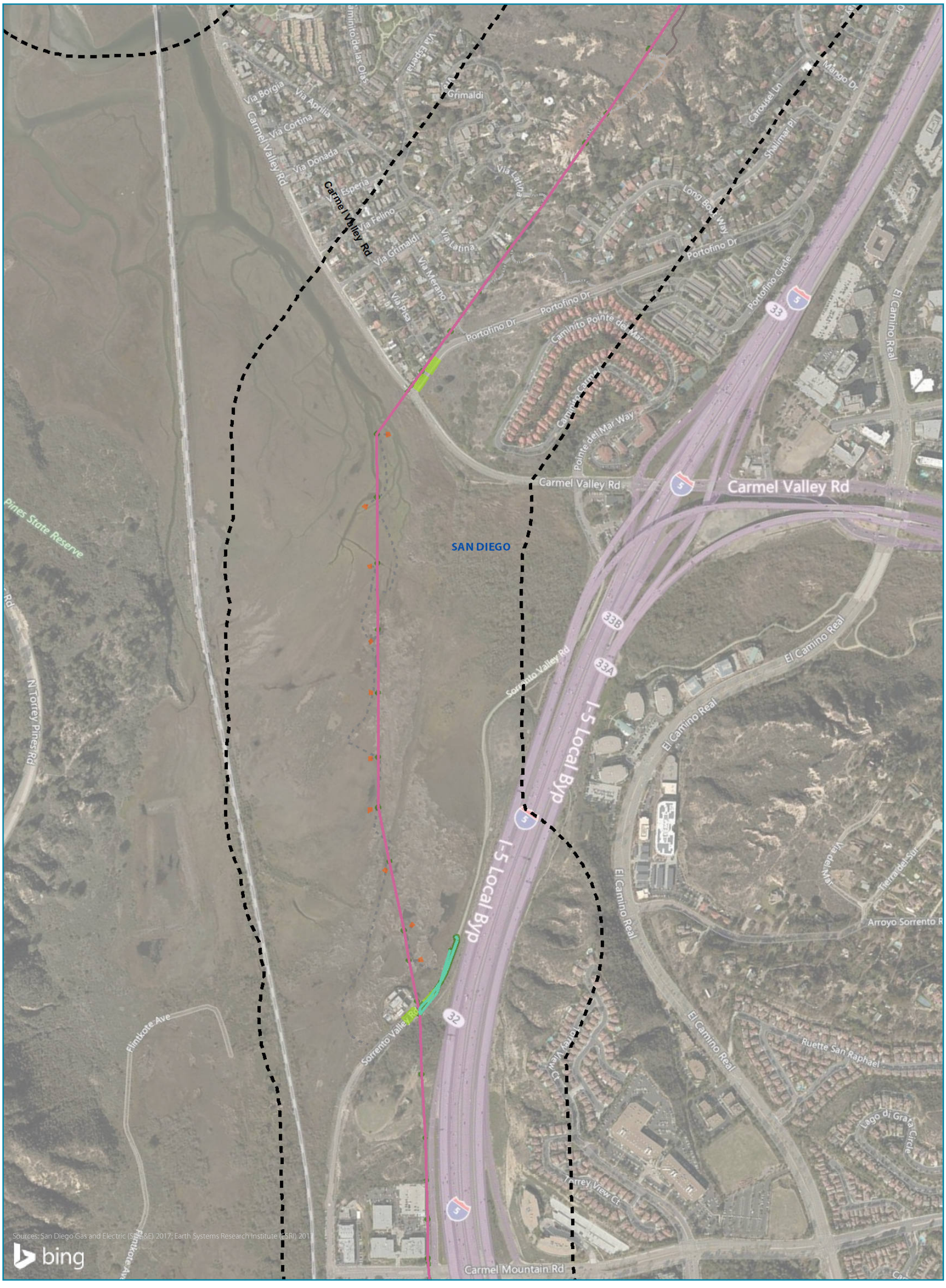

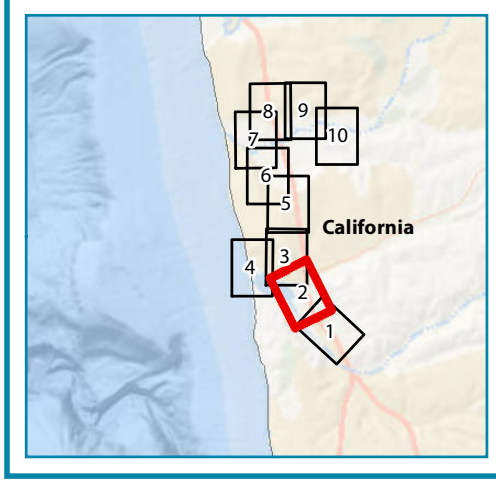

Proposed Project Components
- C738 Conversion
- TL666D Removal
- Drop Zone
- Stringing Site
- Work Area
- Existing Footpath
- Existing Footpath/ATV Access
- Temporary Footpath
- 1,000-foot Study Area

- Jurisdictional Boundary

Sensitive Receptors
- School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal
Project Overview Map
San Diego County, California
January 2019

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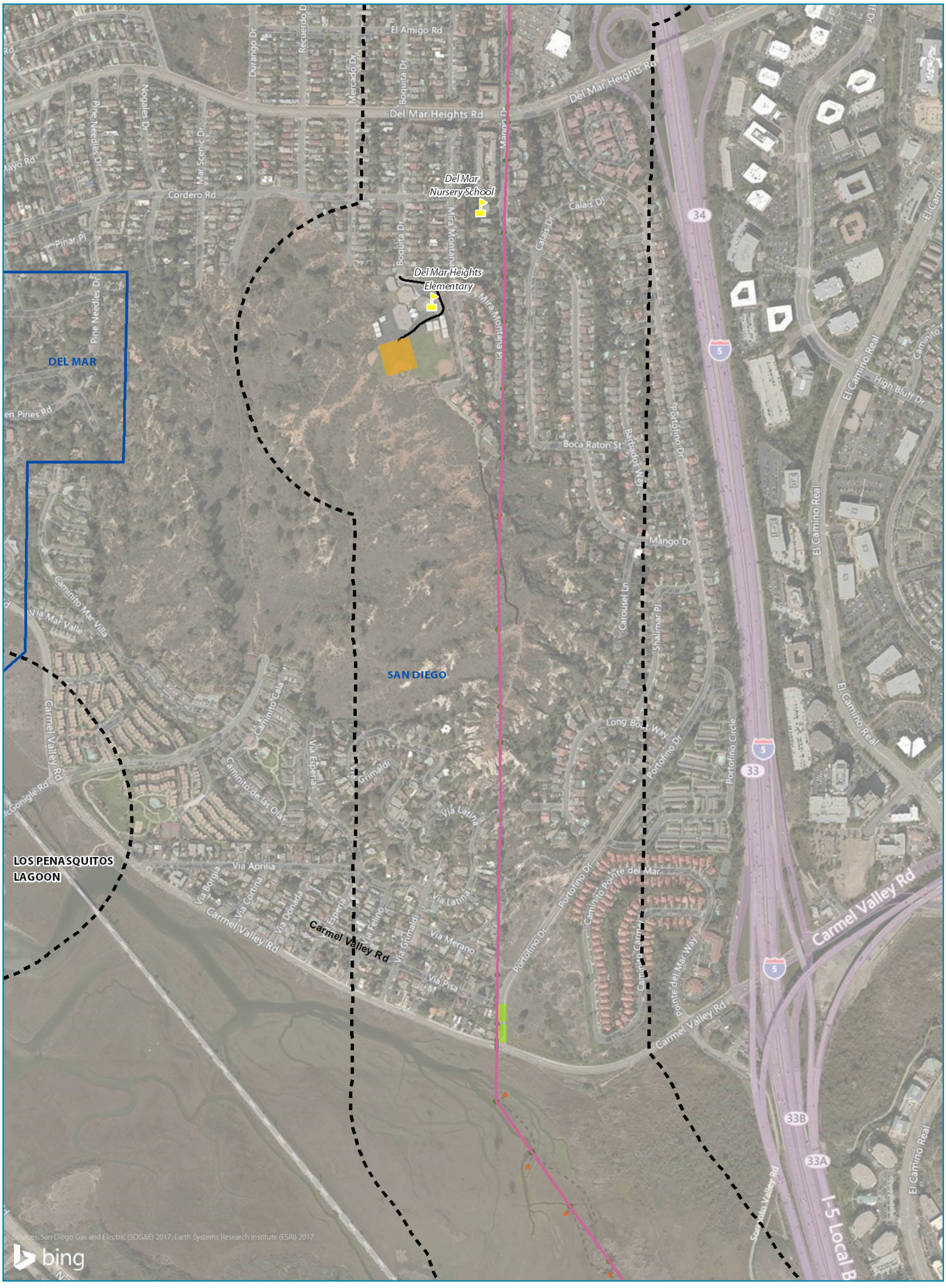

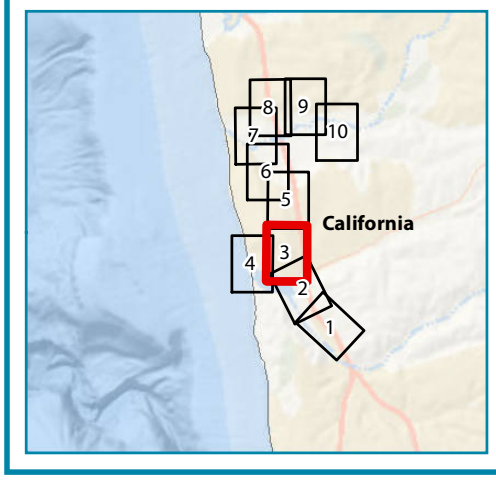

Proposed Project Components
- TL666D Removal
- Drop Zone
- Fly Yard
- Stringing Site
- Work Area
- Existing Access Road
- Existing Footpath
- Existing Footpath/ATV Access
- Temporary Footpath

- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project
Vicinity TL 674A Reconfiguration and TL666D Removal
Project Overview Map
San Diego County, California
January 2019

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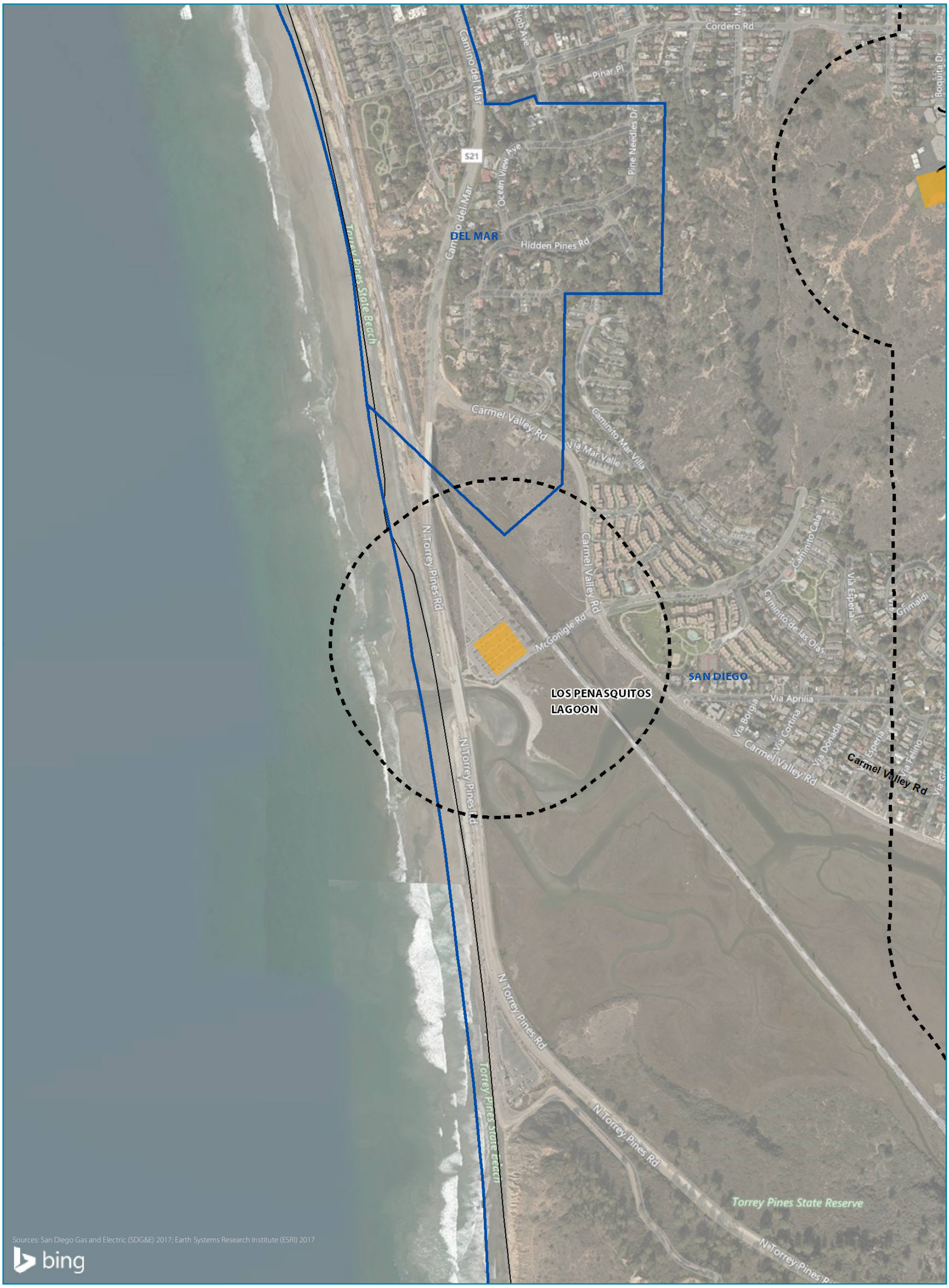

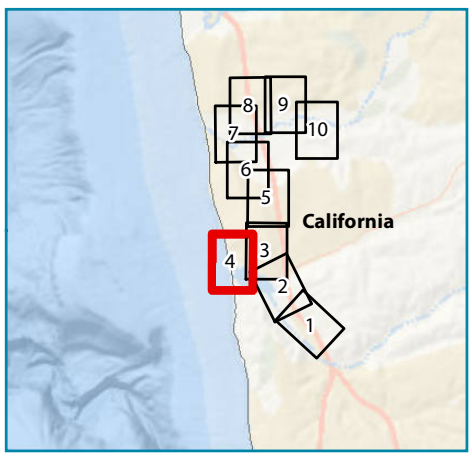

Fly Yard

Existing Access Road

1,000-foot Study Area

Jurisdictional Boundary

Sensitive Receptors

School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal
Project Overview Map
San Diego County, California
January 2019

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0 500 1,000 Feet

0 150 300 Meters

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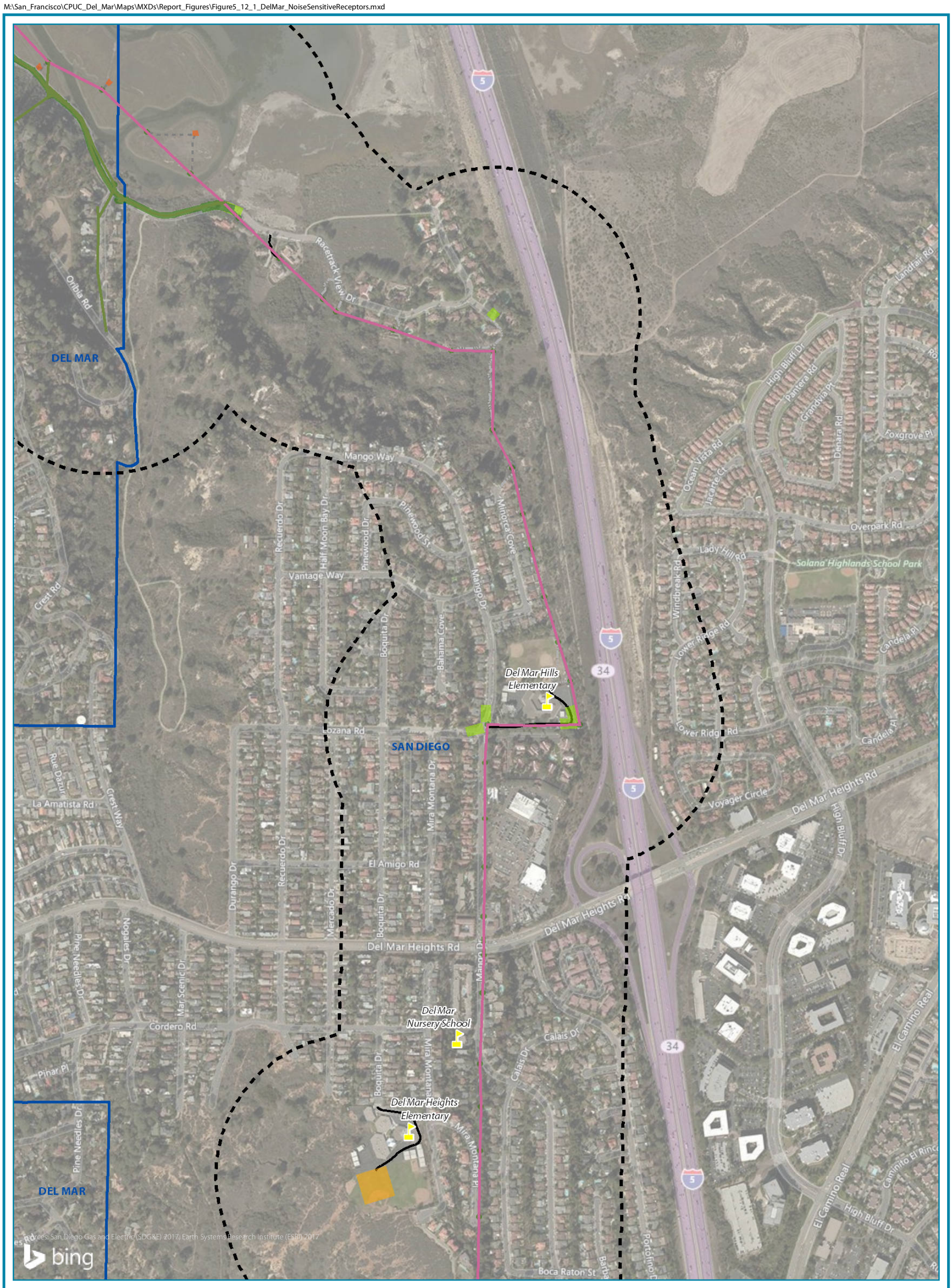

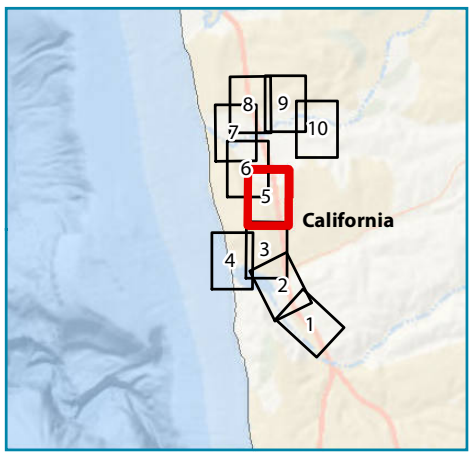

Proposed Project Components
- C510 Conversion
- TL666D Removal
- Drop Zone
- Fly Yard
- Stringing Site
- Work Area
- Existing Access Road
- Existing Footpath
- Temporary Footpath

- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project
Vicinity TL 674A Reconfiguration and TL666D Removal
Project Overview Map
San Diego County, California
January 2019

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0 150 300 Meters

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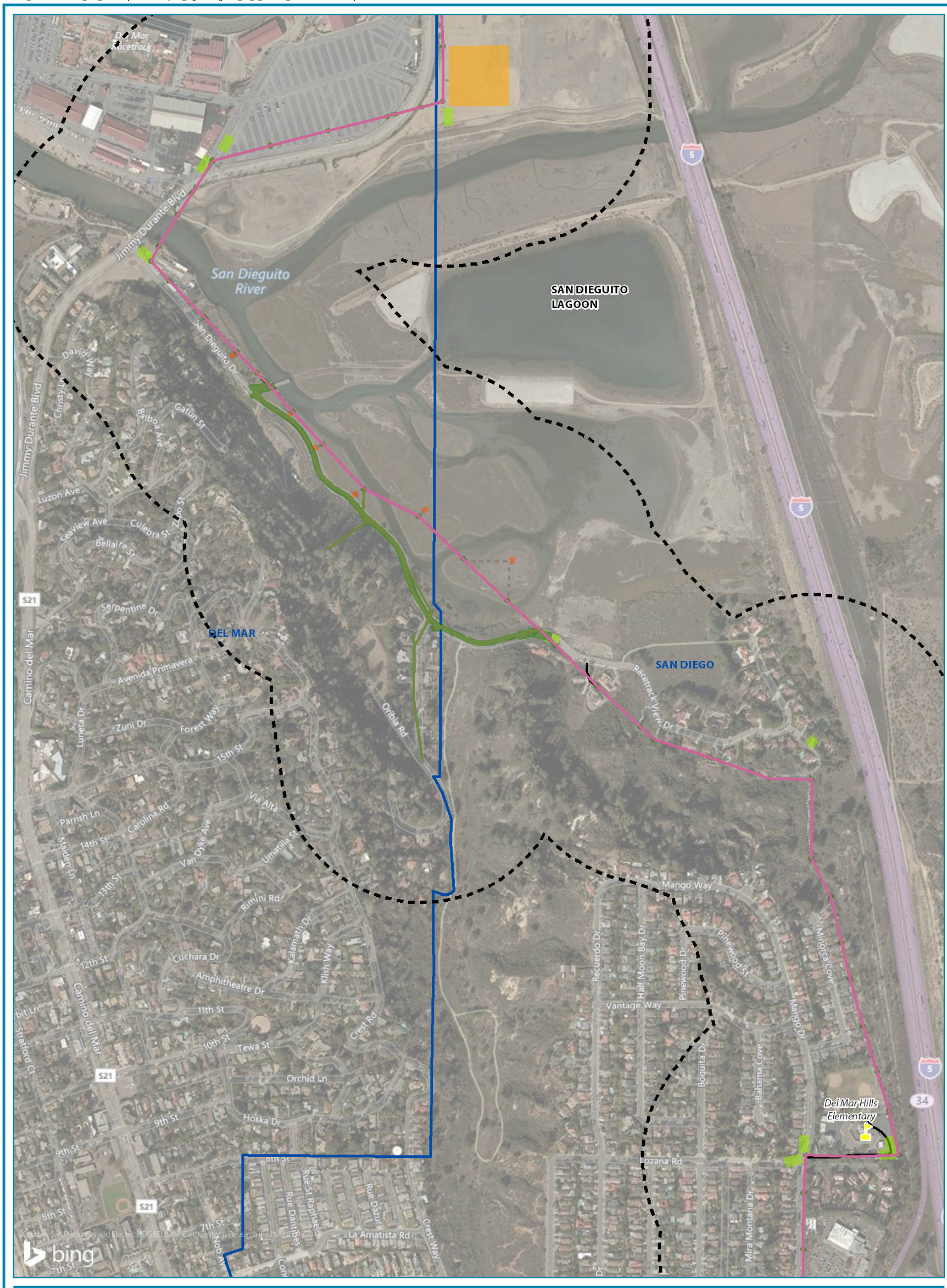

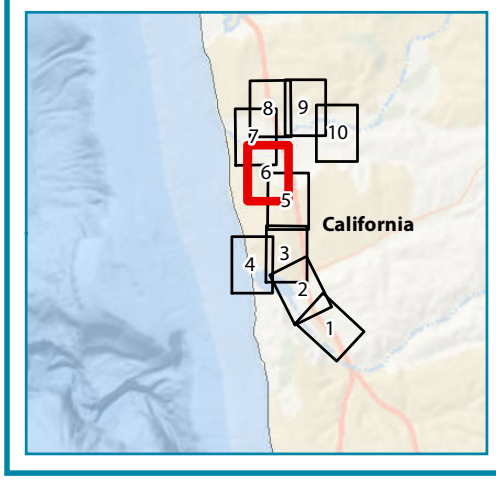

Proposed Project Components
- C510 Conversion
- TL666D Removal
- Drop Zone
- Fly Yard
- Stringing Site
- Work Area
- Existing Access Road
- Existing Footpath
- Temporary Footpath

- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal Project Overview Map
San Diego County, California
January 2019

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0 500 1,000 Feet
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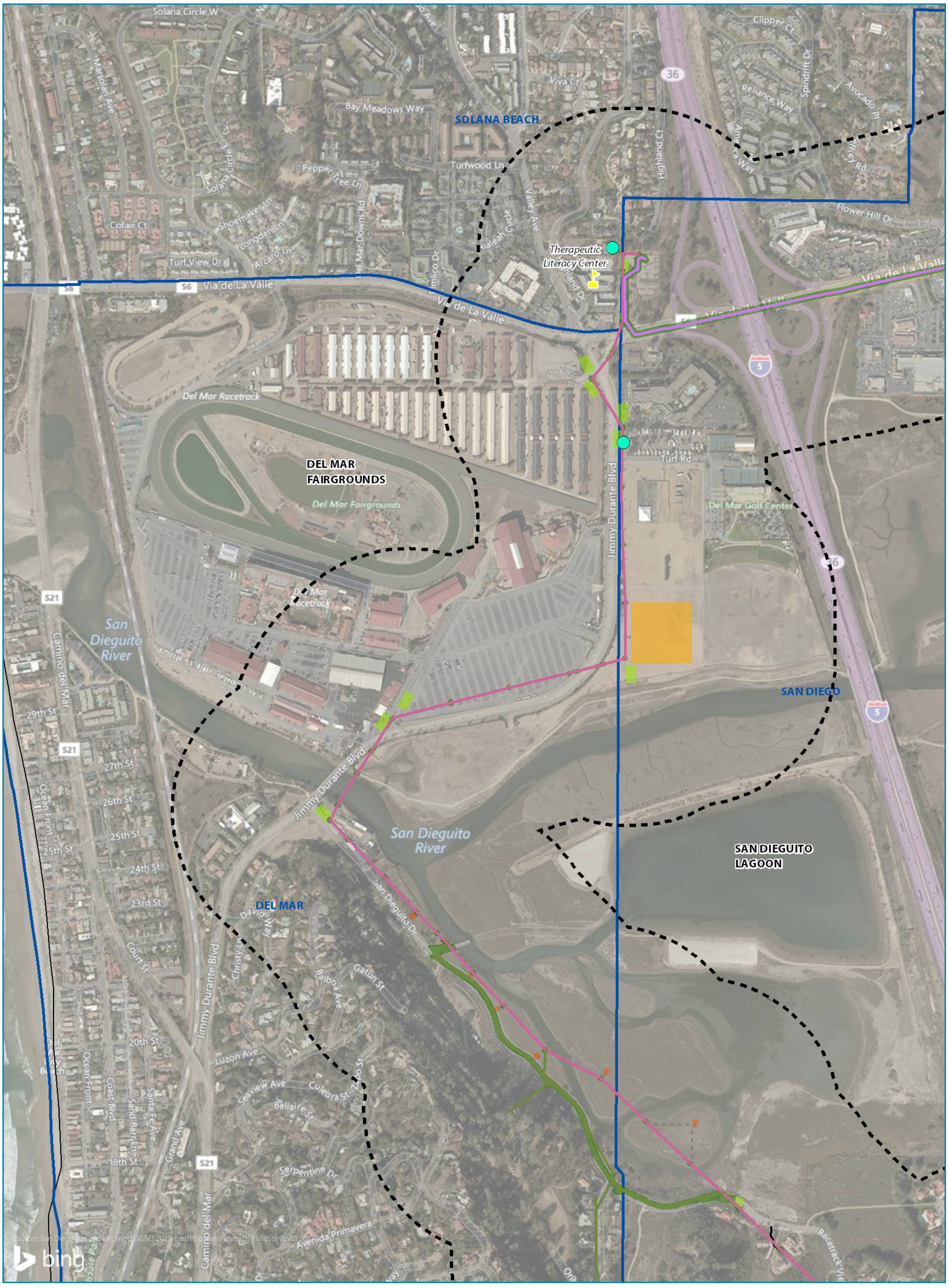

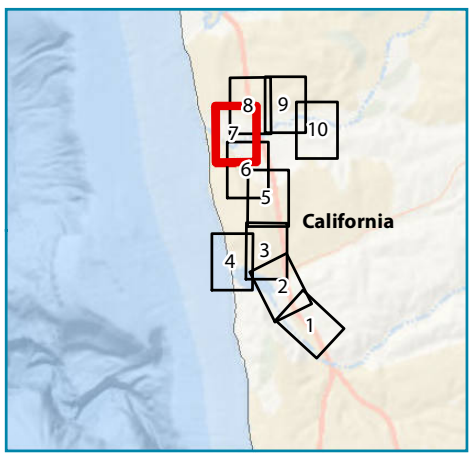

Proposed Project Components
- C510 Conversion
- TL666D Removal
- TL674A Reconfiguration
- Drop Zone
- Fly Yard
- Stringing Site
- Work Area
- Existing Access Road
- Existing Footpath
- Temporary Footpath
- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School
- Residence

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal Project Overview Map
San Diego County, California
January 2019

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0 500 1,000 Feet
0 150 300 Meters

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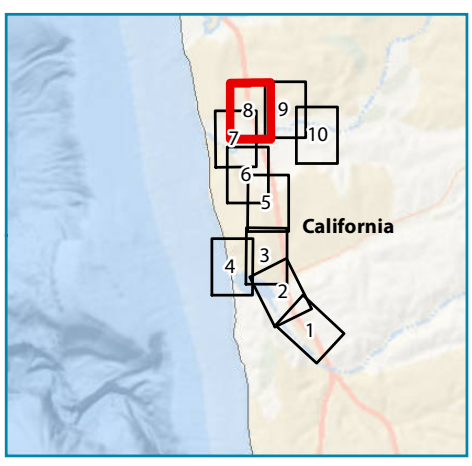

Proposed Project Components
- TL666D Removal
- TL674A Reconfiguration
- Fly Yard
- Stringing Site
- Work Area
- Temporary Footpath
- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School
- Residence

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project
Vicinity TL 674A Reconfiguration and TL666D Removal
Project Overview Map
San Diego County, California
January 2019

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0 500 1,000 Feet
0 150 300 Meters

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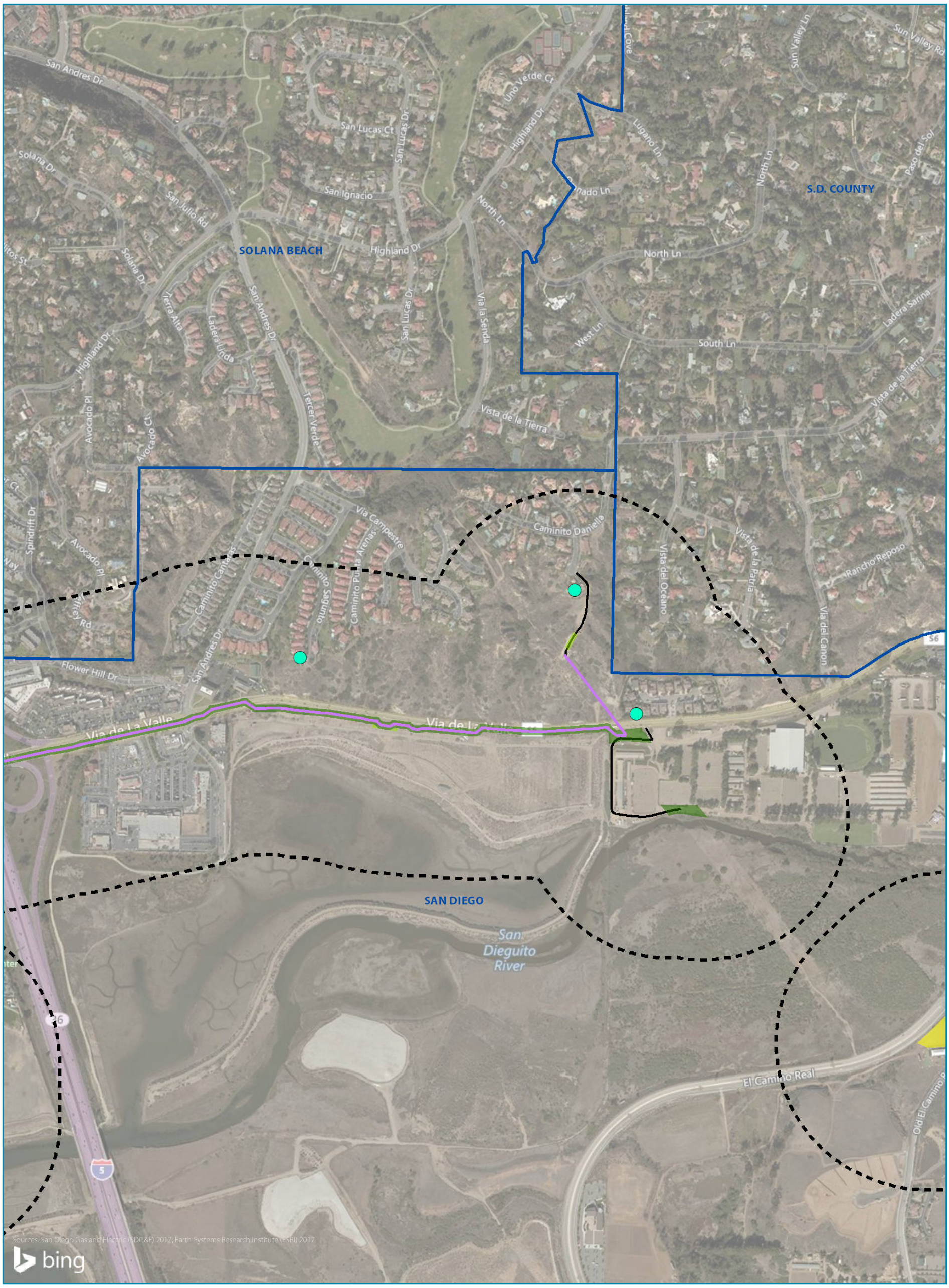

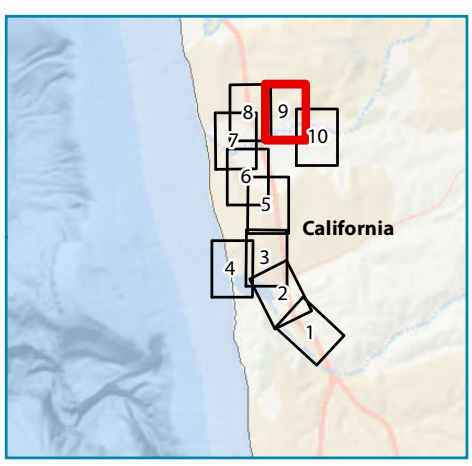

Proposed Project Components
- TL674A Reconfiguration
- Staging Yard
- Stringing Site
- Work Area
- Existing Access Road
- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors
- School
- Residence

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal Project Overview Map
San Diego County, California
January 2019

N

0 500 1,000 Feet
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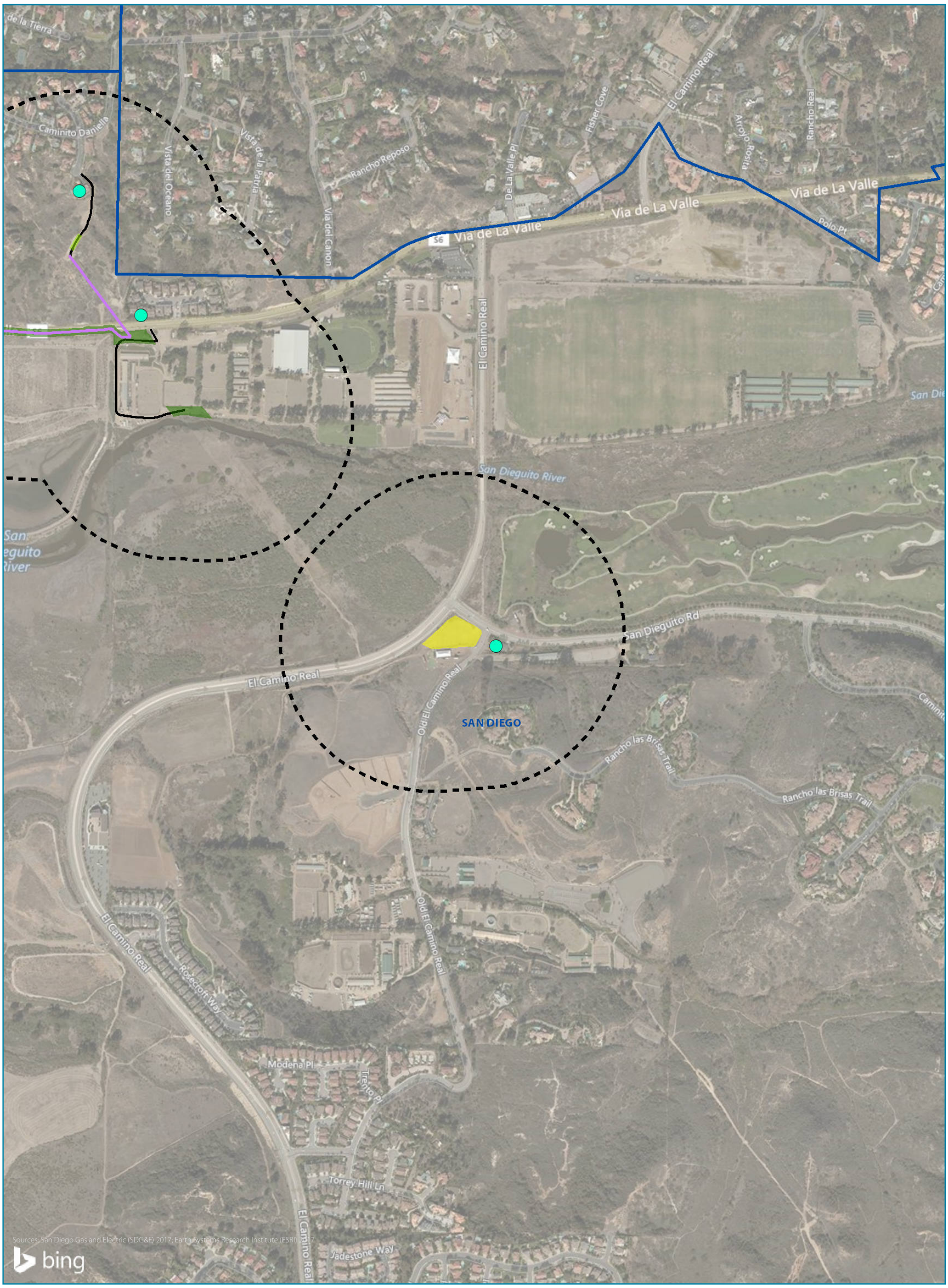

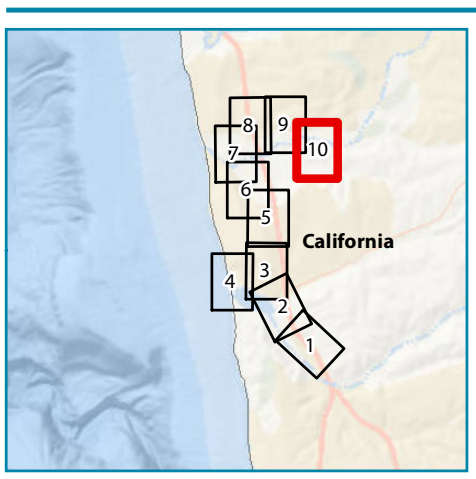

Proposed Project Components

- TL674A Reconfiguration
- Staging Yard
- Stringing Site
- Work Area
- Existing Access Road
- 1,000-foot Study Area
- Jurisdictional Boundary

Sensitive Receptors

- School
- Residence

Figure 5.12-1
Noise-Sensitive Receptors within 1,000 Feet of the Proposed Project Vicinity TL 674A Reconfiguration and TL666D Removal Project Overview Map
San Diego County, California
January 2019

N

0 500 1,000 Feet
0 150 300 Meters

5.12.2 Regulatory Setting

Federal

Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual

This manual includes guidelines for construction noise and vibration thresholds that can be used as reference for noise impact analyses. The threshold for daytime construction noise impacts in outdoor areas is 90 dBA L_{eq}. The guidance threshold for construction vibration damage to non-engineered timber and masonry buildings is 0.2 inches per second peak particle velocity (PPV). The threshold for human annoyance (i.e., distinctly perceptible vs. barely perceptible) for groundborne vibration is 75 VdB (FTA 2006). These thresholds are used in the impact analysis in Section 5.12.3, "Environmental Impacts and Assessment."

Occupational Health and Safety Administration Hearing Conservation Program

This program requires employers to monitor noise exposure levels to accurately identify employees exposed to noise at or above 85 dB averaged over 8 working hours. Workers must be provided hearing protectors if they are exposed to 8-hour time-weighted average noise levels of 85 dB and above (OSHA 2002). The proposed project would expose workers to noise during construction.

State

California Health and Safety Code Sections 1600 to 46080 (California Noise Control Act)

This act declares excessive noise a serious hazard to public health and welfare and acknowledges the continuous and increasing bombardment of noise in urban, suburban, and rural areas. Furthermore, the state must provide an environment for all Californians free from noise that jeopardizes their health or welfare through the control, prevention, and abatement of noise (State of California 1993). The proposed project would expose the public to noise.

California Government Code Section 65302

The State of California requires local governments to perform noise surveys and implement a noise element as part of their General Plans. The state also recommends interior and exterior noise standards by land use category and standards for the compatibility of various land uses and noise levels (State of California 2015). Project construction would be subject to performance-based noise regulations and limitations (e.g., noise ordinances) as established in the municipal code for the cities of San Diego and Del Mar.

Local

California Public Utilities Commission (CPUC) General Order 131-D, Section XIV.B, states that "local jurisdictions acting pursuant to local authority are preempted from regulating electrical power line projects, distribution lines, substations or electrical facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters."

San Diego Municipal Code, Noise Abatement and Control

The City of San Diego regulates noise to promote public health, comfort, and convenience. It is unlawful for any person to cause noise by any means to the extent that the 1-hour average sound level exceeds the applicable limit given in the following table, at any location in the city of San Diego on or beyond the boundaries of the property on which the noise is produced. The following provisions for construction are relevant to the proposed project, and Table 5.12-3 lists the City of San Diego's sound level limits:

Article 9.5 Section 59.5.0404 of the City of San Diego Municipal Code dictates that except for emergency work, construction equipment shall not be operated between 7 p.m. and 7 a.m., or on Sundays or holidays. Construction equipment operating within approved daytime hours (7 a.m. to 7 p.m.) may not exceed an average sound level of 75 dBA for the 12-hour period, as measured from the property boundary where the noise source is located, or on a property occupied by receptors.

Table 5.12-3 City of San Diego Sound Level Limits in Decibels (dBA)

Zone	Time	Sound Level Limits (dBA)[a]
Single Family Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
Multi-Family Residential[b]	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
All other residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60 60
Industrial or Agriculture	Anytime	75

Source: City of San Diego 2017
Notes:
[a] One-hour average
[b] Up to a maximum density of 1 unit per 2,000 sq. ft. of lot area

City of Del Mar Community Plan

The City of Del Mar Community Plan references noise in the context of reducing the level of noise created by major transportation routes in the community, but does not have policies specific to construction activities (City of Del Mar 1976).

City of Del Mar Municipal Code

Del Mar's Municipal Code addresses noise in Chapter 9.20, Noise Regulations. Table 5.12-4, lists the city's general sound level limits, which would apply to construction noise in Del Mar.

Table 5.12-4 City of Del Mar Sound Level Limits in Decibels

Zone[a]	Time of Day	Sound Level (dBA)[b]
generally residential, residential-mixed and open space overlay zoning categories	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 40
generally commercial (professional, visitor, residential commercial, beach commercial) zoning categories	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 50
rail corridor	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55

Source: City of Del Mar Municipal Code, Ch. 9.20
Notes:
[a] The municipal code establishes sound level limits that apply to individual zoning districts; this table presents a simplified version of the applicable limitations grouped by land use category. Please refer to Chapter 9.20 of the Municipal Code for specific limitations by zoning district.
[b] One-hour average

In accordance with the City of Del Mar Municipal Code, construction activities may not cause an hourly average sound level greater than 75 dBA on property zoned or used for residential purposes, and shall not be performed:

- On Sundays or city holidays,
- Before 9:00 a.m. or after 7:00 p.m. on Saturday, or
- Before 7:00 a.m. or after 7:00 p.m. on Monday through Friday.

The municipal code permits individuals to perform construction work on their own property, provided such construction activity is not carried on for profit or livelihood, between the hours of 10:00 a.m. and 5:00 p.m. on Sundays and city holidays (City of Del Mar 2017).

5.12.3 Environmental Impacts and Assessment

Applicant-Proposed Measures

The applicant has not incorporated applicant-proposed measures (APMs) into the proposed project to specifically minimize or avoid noise-related impacts. **APM PS-01**, included in Section 5.14, "Public Services" addresses project construction activities that have "the potential to impact schools… in an effort to avoid major school events and to minimize any disruption to learning..." This APM includes actions by the applicant to reduce or avoid construction-related noise by coordinating with school officials to "conduct construction activities outside of the scheduled school year, during seasonal breaks, outside of peak drop-off and pick-up hours for the standard school day, at night, or during weekends." A list of all project APMs is included in Table 4-9 in Section 4.0, "Project Description."

Significance Criteria

Table 5.12-5 includes the significance criteria from Appendix G of the CEQA Guidelines' noise section to evaluate the environmental impacts of the proposed project.

Table 5.12-5 Noise Checklist

Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

a. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Equipment that may be used to carry out project construction activities would be similar to equipment used in most public works projects. Table 5.12-6 identifies ~~20 of~~ the most commonly used types of equipment. Noise levels are measured in decibels at a reference distance of 50 feet from the source. Noise levels are conservatively presented, because the reported outputs assume that no equipment muffling, shielding/baffling, or other means of noise reduction is reflected in the data. Muffling, shielding/baffling, or other noise reduction techniques could reduce the level of noise from its source to receptor.

Construction work would occur at specific work areas, proceeding from one location to the next within one of the four utility corridors where specific construction activities have been identified. Construction would also occur at the Del Mar Substation site during works associated with circuit breaker removal and replacement. Each work area is considered separate to ensure that noise-generating characteristics are captured in the evaluation of potential construction noise impacts.

Table 5.12-6 Typical Construction Equipment Noise Levels

Equipment Type	Maximum Noise Level at 50 feet (dBA)
Concrete Saw	90
Mower	88
Drill Rig/Truck-Mounted Augur	85
Grader	85
Impact Wrench	85
Jackhammer	85
Vacuum Truck	85
Dump Truck, Flatbed Truck	84
Crane	81
Excavator	81
Rock Drill/Rock-Drilling Equipment	81
Air Compressor	80
Backhoe	80
Forklift	80
Haul/Dump Truck	80
Water Truck	80
Wire-pulling Machine	80
Loader	79
Paver	77
Aerial Bucket Truck	75
Portable Generator	73

Source: SDG&E 2017

The ~~three~~ four distinctive groups of activities involve the use of mechanical tools to facilitate (1) construction and removal of overhead power lines and infrastructure; (2) converting and reconfiguring existing overhead circuitry to an underground configuration; (3) removing and replacing a circuit breaker at the Del Mar Substation; and (~~3~~ 4) noise-generating activities associated with vehicle movements, machinery, and from helicopter operations associated with power pole topping and removal in environmentally sensitive areas. These ~~three~~ four groups of construction activities contain adequate detail to evaluate the proposed project's anticipated construction noise impacts. Table 5.12-7 would be used for overhead power line construction and removal as well as various other tasks at other work sites within project utility corridors

Overhead Power Line Construction and Removal

The proposed project would entail removal of existing overhead conductor, removal and topping of existing power line poles, and installation of new power line poles. Construction at each discrete work site may include vegetation clearing, foundation excavation and installation (as needed) and replacement poles, as well as wire stringing. Where existing wood poles would be completely removed, extracted pole bases would be backfilled with soil, except in the San Dieguito Lagoon, Los Peñasquitos Lagoon, and Torrey Pines State Natural Reserve Extension.

Table 5.12-7 Typical Eight-hour Average Noise Levels from Construction Equipment

Equipment	8-hour Noise Levels from Source (dBA)				
	50 ft.	100 ft.	200 ft.	500 ft.	1,000 ft.
Air Compressor	73	67	61	53	46
Aerial Bucket Truck	73	67	61	53	46
Backhoe	76	70	64	56	49
Crane	76	70	64	56	49
Drill Rig/Truck-Mounted Augur	78	72	66	58	51
Grader	75	69	63	55	48
Mower	75	69	63	55	48
Impact Wrench	80	74	68	62	58
Forklift	80	74	68	62	58
Haul/Dump Truck	80	74	68	62	58
Water Truck	80	74	68	62	58
Loader	79	73	67	61	57
Portable Generator	70	64	58	50	43
Rock Drill/Rock-Drilling Equipment	74	68	62	54	47
Backhoe	83	77	71	63	56
Concrete Saw	73	67	61	53	46
Crane	77	71	65	57	50
Excavator	78	72	66	58	51
Jackhammer	75	69	63	55	48
Paver	74	68	62	54	47
Dump Truck, Flatbed Truck	76	70	64	56	49
Vacuum Truck	81	75	69	61	54
Wire Pulling Machine	74	68	62	54	47

Source: FHWA 2006

Note: Noise levels listed above are illustrative and represent the typical types of equipment that would be used for project construction. Values in dark boxes exceed the 75 dBA noise threshold at the stated distance from the source; grey shading indicates noise level is at the reported threshold.

Key:
dBA = A-weighted decibels
ft = feet

Generally, pole work could be moderately noisy at times, averaging about 82 dBA, which would exceed the 75-dBA threshold at adjoining residential property lines established in both City of San Diego and City of Del Mar noise ordinances. As noted in the applicant's Proponent's Environmental Assessment, construction activity between three sets of existing poles (San Diego Gas & Electric [SDG&E] poles 24 and 49; poles 52 and 71; and poles 77 and 81) on TL666D would occur within 50 feet of approximately 84 residential parcel lines (SDG&E 2017).

In the event that construction noise could expose sensitive receptors to noise levels greater than 75 dBA at 50 feet from residential parcel lines, the applicant shall adhere to the timeframes established by local ordinances to limit noise events to permitted times for construction activity as identified in **MM NOI-1**.

> **MM NOI-1: Limit Construction Hours.** Hours of operation of all construction equipment shall be limited to the following days and times as permitted by the noise ordinances in each jurisdiction:
>
> - **City of San Diego:** 7:00 a.m. to 7:00 p.m. Monday through Saturday (no holidays).
> - **City of Del Mar:** 9:00 a.m. to 7:00 p.m. on Saturday and 7:00 a.m. to 7:00 p.m. Monday through Friday (no holidays).
>
> In the event that project scheduling necessitates work outside of the hours permitted under local noise ordinances, SDG&E would meet and confer with the local jurisdictions, as needed, for guidance on scheduling and managing such construction noise in compliance with Article 9.4: Noise Abatement and Control, of the City of San Diego Municipal Code.

It is not likely that any one piece of machinery would operate continuously or fully throttled. Noise events would be punctuated by periods during which no equipment would operate, and noise levels at work sites would be near ambient levels. The characteristics related to a particular tool's use (duration, intensity and location) factor into developing average sound levels assigned to each piece of equipment over a typical 8-hour day.

Circuit Breaker Removal and Replacement, Del Mar Substation

The nearest receptor to the Del Mar Substation is a residential use located upslope approximately 130 feet north from the circuit breaker removal and replacement area. To the east of the substation and downslope is an I-5 off-ramp connecting to Via De La Valle and interstitial open space. To the south is the substation's private driveway from Via De La Valle. To the west is an approximately 30-foot-wide roadway that provides access to the residents atop the hill north of the substation site. On the western side of the roadway are a mix of commercial uses, including the Therapeutic Learning Center about 228 feet southeast of the circuit breaker work area on the substation site. Construction noise would be generated by the use of equipment and machinery, such as jackhammers, loaders, forklifts, and haulers, at the substation site. This equipment would be used to remove existing an circuit breaker and to lay new concrete foundation; to remove, replace, and off-haul circuit breaker unit(s); and to create a trench for underground conduit that would connect transmission/distribution lines that would feed into the substation.

Substation work could generate 8-hour average noise levels of up to 80 dBA at 50 feet from the source. Noise levels would attenuate to about 71 dBA at the nearest residential receptor to the north and to approximately 69 dBA at the property line of the Therapeutic Learning Center to the southeast. It is noted that on this site as on others, crews would not operate noisy equipment for entire workdays uninterrupted. Noise levels represent maximum levels from intermittent noise events from various noise-producing sources that are then averaged over an 8-hour period. Although construction noise would be temporary and intermittent, **MM NOI-2** is identified to address receptors 50 or nearer to construction noise sources.

~~Moreover, **MM NOI-2** has been identified for the notification of receptors within 50 feet of construction areas.~~ As noted in the measure, sensitive receptors shall be notified at least 30 days prior to commencement of construction in order to provide opportunity to avoid construction noise when work is scheduled nearest the affected party.

> **MM NOI-2: Advance Notice of Construction.** The applicant shall notify all sensitive receptors, including residences, within 50 feet of all project components at least 30 days prior to construction activities occurring in that area to provide opportunity to avoid the noise. The notice shall include dates, times, and description of construction activities. The applicant shall provide documentation of the notice and coordination to the CPUC at least 20 days prior to construction.

According to the applicant, work in the proximity of any single location on the power line would likely last between a few hours when topping or removing an existing pole to a few days to one week when installing new poles or removing/installing new conductor. As a means of further reducing construction noise exposure to sensitive receptors, the applicant shall implement **MM NOI-03**.

> **MM NOI-3: Measures to Reduce Noise Levels.** The applicant shall include measures to ensure that the project would not increase ambient noise levels in excess of 10 dBA or to exceed levels specified in the City of San Diego or Del Mar's noise ordinance, whichever is higher. The measures shall be selected based on the specific equipment used, activity conducted in specific locations, and proximity to sensitive noise receptors and efficacy to reduce, avoid or eliminate sources of project-generated noise in excess of acceptable standards. Specific measures may include:
>
> - Temporarily and safely installing and maintaining absorptive noise control barriers ~~in the perimeter of construction sites and/or~~ between stationary construction equipment and sensitive noise receptors when located within 200 feet of noise-intensive equipment operating more than 4 hours a day. The applicant shall notify all residents located within 50 feet of the absorptive barriers.
> - Limiting heavy equipment activity adjacent to residences or other sensitive receptors to the shortest possible period required to complete the work activity.
> - Ensuring that proper mufflers, intake silencers, and other noise reduction equipment are in place and in good working condition.
> - Maintaining construction equipment according to manufacturer recommendations.
> - Minimizing unnecessary construction equipment idling.
> - Reducing noise from back-up alarms (i.e., alarms that signal vehicle travel in reverse) in construction vehicles and equipment by providing a layout of construction sites that minimize the need for back-up alarms. Use flagmen to minimize the time needed to back up vehicles.
> - When possible, using construction equipment specifically designed for low noise emissions, such as equipment that is powered by electric or natural gas engines instead of diesel or gasoline reciprocating engines.
> - Where practical, locating stationary equipment such as compressors and generators away from sensitive receptors.

SDG&E has determined that the use of temporary noise barriers would be infeasible due contractors using mobile construction equipment to complete the pole removal, installation, and topping work. Noise attenuation for these activities would necessitate barriers placed outside of planned work areas in order to maintain safe clearances for mobile equipment. Further, most work at pole locations is anticipated to last one day or less. Set up and removal of barriers would constitute substantial additional time and work at each location and could delay construction and attendant construction-related effects to residents. For those reasons, the use of temporary noise control barriers recommended in **MM NOI-3** would be only feasible to implement with the use of stations (i.e., non-mobile) construction equipment.

Underground Power Line Construction

As described in ~~Section~~ Chapter 4.0, "Project Description," the proposed project would also include three segments of new underground power line associated with TL674A reconfiguration, C510 conversion, and C738 conversion. As shown in Table 5.12-7, above, concrete saws for cutting through pavement prior to excavating the required trenches would be the loudest piece of equipment utilized during construction of the underground segments. Shaded boxes illustrate that construction noise may exceed the 75-dBA limit in various locations. Use of this type of saw would generate an eight-hour average noise level of 75 dBA at a distance of approximately 125 feet from the source. As a result, any residences located within 125 feet of these underground segments may be temporarily exposed to noise levels in excess the acceptable threshold (75 dBA). Of the proposed project's three underground segments, the C510 conversion is the only one with residential parcels (approximately 12) located within 125 feet of the proposed alignment.

MM NOI-1, **MM NOI-2**, and **MM NOI-3**, as previously discussed, would be implemented to reduce noise from work in the C510 and C738 corridors. Because the applicant has determined the use of temporary barriers is infeasible for temporary mobile construction work, SDG&E would, in the event that construction noise would exceed 75 dBA at adjacent residential property lines, meet and confer with the City of San Diego and/or the City of Del Mar to discuss temporarily deviating from the local noise standards. This process is included as a Project Design Feature and Ordinary Construction Restriction in Chapter 4, "Project Description." If requested by the pertinent local agency, SDG&E would evaluate the potential to offer temporary relocation of residents.

With and the implementation of **MM NOI-1**, **MM NOI-2**, and **MM NOI-3**, as well as ordinary construction restrictions, impacts associated with overhead power line construction and removal would be less than significant.

Staging / Fly Yards

The proposed project would include four staging areas/fly yards for use during construction for refueling construction vehicles, pole assembly, open storage of material equipment, trailers, portable restrooms, and construction personnel parking. These sites may also be used for the staging and refueling of helicopters during the conductor installation/removal processes and during pole removal and topping activities. The applicant indicates the potential for the use of two helicopter types, a Kaman K-Max and/or Hughes 500, to facilitate conductor and pole removal in wetland and other sensitive areas where access limitations would preclude use of ground-based crews, such as within the San Dieguito Lagoon, Peñasquitos Lagoon and Torrey Pines State Nature Reserve Extension. While it is likely that either helicopter would accomplish pole topping, removal, and off-haul tasks, this analysis conservatively considers the craft that

would result in higher operating noise generation, which would account for the other craft's lesser noise, should SDG&E use the helicopters interchangeably. Helicopter use would occur up to 8 hours per day for 10 days during the 12-month construction period. According to technical specifications, the Hughes500's operational noise ranges from about 89 dBA at liftoff, 88 dBA during flyovers, and about 90 dBA on approach.

Table 5.12-8 indicates average noise levels proximate to nearest residential parcels at the proposed staging areas and fly yards.

Table 5.12-8 Anticipated Staging Area/Fly Yard Noise Levels

Staging Area/Fly Yard	Distance and Direction Nearest Residential Property Line (feet)	Anticipated 8-hour Average Noise Level (dBA)
Pumpkin Patch	450 feet south	71
Del Mar Fairgrounds	2,400 feet southwest	56
Del Mar Heights	420 feet east	72
Torrey Pines State Beach	640 feet northeast	68

Source: SDG&E 2017

Noise generated at these sites would be intermittent and associated with periodic movement of equipment in and out of the staging area and helicopter operation. When noise attenuation is considered based on distances to receptors at the nearest residential parcels, resulting 8-hour noise levels may audible and to some potentially considered a nuisance, but levels would not exceed the 75 dBA threshold established in local ordinances.

Noise generated from the operation and maintenance phase of the project is anticipated to be minimal and would result primarily from the operation of maintenance vehicles. Normal operations and maintenance would not cause noticeable increases of ambient noise at the closest receptors. While construction noise may temporarily expose certain receptors nearest work areas to noise at levels in excess of 75 dBA, implementation of **MM NOI-1**, **MM NOI-2**, and **MM NOI-3**, project noise impacts would be less than significant.

Significance: Less than Significant with Mitigation Incorporation.

b. ***Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?***

Groundborne vibration during construction would occur mainly from heavy duty construction equipment, such as drilling rigs, jack hammers, and loaded trucks. Construction vibration levels for one piece of each type of equipment at 50 feet are shown in Table 5.12-9.

Table 5.12-9 Anticipated Construction Vibration Levels

Equipment	Vibration of One Piece of Equipment at 50 feet		Exceeds FTA Threshold at 50 feet?	
	PPV[a]	VdB[b]	Structural Damage (0.2 PPV)	Human Annoyance (75 VdB)
Caisson Drill	0.03	43	No	No
Jack Hammer	0.01	39	No	No
Loaded Truck	0.03	43	No	No

Source: FTA 2006.
Notes:
[a] Calculated using PPVequip = PPVref x (25/D)1.5, where PPVequip is the calculated vibration of the equipment in PPV, PPVref is the equipment's PPV at 25 feet (inches/second), and D is a distance of 50 feet.
[b] Calculated using Lv(D) = Lv(25 feet) – 30log(D/25), where Lv(D) is the calculated vibration of the equipment in VdB, Lv is the approximate level of vibration of the equipment at 25 feet, and D is a distance of 50 feet.
Key:
FTA = Federal Transit Administration
PPV = perturbation projection vector
VdB = vibration decibels

The applicant anticipates simultaneously using a maximum of two drill rigs with augers and five loaded trucks during the various construction activities for each component of the proposed project. Jackhammers would be used on an as-needed basis to break up concrete (SDG&E 2017). Though multiple pieces of equipment could cause greater vibration levels than those in Table 5.12-9, vibration would be either intermittent or continuous with a limited duration, and it would be unlikely that all described pieces of equipment would operate concurrently during project construction. For example, perception of vibration from trucks would be intermittent as trucks pass through the vicinity of sensitive receptors. Perception of vibration from drilling would be continuous, but with a limited duration. The vibration annoyance from construction would be less than significant. Groundborne noise would be lower than noise emitted directly from equipment. Groundborne noise levels generated from operation of the proposed project would be minimal to the closest receptors, resulting primarily from the operation of maintenance vehicles. Operational groundborne noise impacts would therefore be less than significant. Normal operations and maintenance activities are not anticipated to cause noticeable groundborne vibration at the closest receptors. Therefore, there would be no change in vibration levels associated with project operations and maintenance activities, and there would be no impact to receptors.

Significance: Less than Significant.

c. Would the project result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction activities would occur over a finite, 12-month period; therefore, no permanent increase in noise would occur, and there would be no impact. The proposed project would not involve construction of any new noise-generating facilities. The removal of TL666D and the conversion of portions of TL674A, C510, and C738 from an overhead to underground configuration would result in a reduction in existing corona noise as underground power line facilities are not audible. As a result, there would be no impact related to increases in ambient noise levels.

Significance: No Impact.

d. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

As described under criterion (a), construction activities would, in most instances, comply with the relevant local noise ordinances for the City of San Diego and City of Del Mar. There may be locations during pole installation/removal and underground duct bank construction where 8-hour average noise levels may exceed 75 dBA at nearby residences and other noise-sensitive receptors (e.g., parks and other recreational uses). Because of the linear nature of the proposed project, construction at each location would range from a few hours to up to one week at a time. Due to the short-term nature of the construction at each location, the number of residents that would be exposed to noise levels in excess of 75 dBA would be limited, and SDG&E would meet and confer with the local agencies to discuss additional measures that may be implemented to reduce impacts. As a result, impacts will be less than significant.

The proposed project would also utilize workspaces within or directly adjacent to two schools—Del Mar Hills Elementary School and Del Mar Heights Elementary School. The majority of these workspaces would be used to top or remove existing TL666D poles. Heavy equipment, including bucket trucks and aerial lifts, would be used in these locations. In addition, a staging area/fly yard would be located within the athletic field at Del Mar Heights School. This landing zone would require construction crews to utilize the school's parking lot and internal roadways for access.

These activities could generate temporary noise levels in excess of 75 dBA, which has the potential to disrupt school activities. To ensure that these schools are not disrupted during construction, SDG&E would implement **APM-PS-01**, which would require that all construction activities be coordinated with schools to minimize potential impacts from noise. With the implementation of this APM and mitigation measures **MM NOI-1**, **MM NOI-2**, and **MM NOI-3**, impacts would be less than significant.

Significance: Less than Significant with mitigation incorporated.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project would not be located within an airport land use plan area or within 2 miles of a public airport or public use airport (the nearest airport, McClellan-Palomar Airport, is at least 10 miles away). Therefore, no impact would occur under this criterion.

Significance: No Impact.

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project would not be located within the vicinity of a private airstrip. The nearest restricted-use runway is Marine Corps Air Station Miramar, at least 6 miles away. Therefore, no impact would occur under this criterion.

Significance: No Impact.

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