APPENDIX K: NOISE TECHNICAL REPORT

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NOISE TECHNICAL REPORT

Eldorado-Lugo-Mohave Series Capacitor Project

Prepared For

Insignia Environmental
Attention: Stephanie Hansen
258 High Street
Palo Alto, California 94301
Phone: 650-321-6787 ext. 337

Prepared By

Eilar Associates, Inc.
Acoustical & Environmental Consulting
210 South Juniper Street, Suite 100
Escondido, California 92025
www.eilarassociates.com
Phone: 760-738-5570
Fax: 760-738-5227

Job #B60102N1

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1.0 EXECUTIVE SUMMARY

The proposed project, Eldorado-Lugo-Mohave Series Capacitor Project, consists of the construction of new mid-line series capacitors to increase capacity and power flow along two of Southern California Edison's (SCE) existing 500 kilovolt (kV) transmission lines. The project also consists of upgrades to three existing substations, the installation of three fiber optic repeater sites, the installation of an Optical Ground Wire (OPGW) on two transmission lines, and modifications at 16 sites along three transmission lines, to address clearance discrepancy issues. The proposed project is located in California and Nevada, within the Mojave Basin and Range (Mojave) and will extend northeast from Lugo Substation (located in San Bernardino County, California) to Eldorado Substation (located in the City of Boulder City, Nevada) and Mohave Substation (located in Clark County, Nevada), and northwest from Mohave Substation to Eldorado Substation. This report has been prepared to assess noise impacts in comparison to the applicable standards of the County of San Bernardino, California; Clark County, Nevada; the City of Boulder City, Nevada; the City of Hesperia, California; and the California Environmental Quality Act (CEQA).

The purpose of this report is to assess temporary construction noise impacts and permanent operational equipment noise impacts from the installation of series capacitor equipment and to determine if mitigation is necessary and feasible to reduce project-related noise impacts to levels that comply with applicable standards and less than significant.

No increase in noise levels is anticipated from existing transmission lines and substations, which will be modified as a part of this project. Potential operational noise impacts were evaluated for proposed capacitor stations near the Pisgah Substation, as well as at the three proposed fiber optic repeater sites. No significant noise impacts are anticipated as a result of these proposed facilities.

Although there are no specific noise level limits for construction activity applicable to this project, noise levels were evaluated for several proposed construction sites and found to be less than significant in comparison to typically acceptable thresholds. By limiting construction activity to the daytime hours as required by local governments and following general good practices, the noise impacts from construction activity can be effectively mitigated.

2.0 INTRODUCTION

This acoustical analysis report is submitted to assess noise impacts from temporary construction and on-site project related noise sources, and to determine if mitigation will be necessary to reduce the noise impacts to meet the applicable noise limits of local jurisdictions. Potential impacts will also be assessed for significance per the California Environmental Quality Act (CEQA).

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol "L_{EQ}." Unless a different time period is specified, "L_{EQ}" is implied to mean a period of one hour. The Day-Night sound level, L_{DN}, is a calculated 24-hour weighted average, where sound levels during nighttime hours of 10 p.m. to 7 a.m. have an added 10 dB weighting. Sound levels expressed in L_{DN} are always based on A-weighted decibels. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances.

Some of the data may also be presented as octave-band-filtered and/or A-octave-band-filtered data, which are a series of sound spectra centered about each stated frequency, with half of the bandwidth above and half of the bandwidth below each stated frequency. This data is typically used for machinery noise analysis and barrier calculations.

Noise exceedance levels are used to indicate the noise level that is exceeded for a given percentage of a measurement duration, and are labeled as L_{xx}, where the subscript is the given percentage. For instance, L_{50} indicates the noise level that was exceeded for 50% of the measurement duration.

2.1 Project Description

The proposed project, Eldorado-Lugo-Mohave Series Capacitor Project, consists of the construction of new mid-line series capacitors to increase capacity and power flow along two of Southern California Edison's (SCE) existing 500 kilovolt (kV) transmission lines. The project also consists of upgrades to three existing substations, the installation of three fiber optic repeater sites, the installation of an Optical Ground Wire (OPGW) on two transmission lines, and modifications at 16 sites along three transmission lines, to address clearance discrepancy issues. The project is needed to safely deliver renewable generation to the Los Angeles Basin from the Eldorado and Mohave Substations. In addition, the project would increase capacity and power flow between SCE's existing Eldorado, Lugo, and Mohave Substations.

The project would include the following main components:

- Construct two new 500 kV mid-line series capacitors (i.e., the proposed Newberry Springs Series Capacitor and Ludlow Series Capacitor) and associated equipment

- Relocate, replace, or modify existing transmission, subtransmission, and distribution facilities at approximately 12 locations along the Eldorado-Lugo, Eldorado-Mohave, and Lugo-Mohave 500 kV Transmission Lines to address 14 potential overhead clearance discrepancies

- Perform minor grading at two discrepancy locations along the Lugo-Mohave 500 kV Transmission Line

- Install distribution facilities to provide station light and power, and connect the proposed Newberry Springs Series Capacitor and Ludlow Series Capacitor sites

- Install distribution facilities to provide station light and power to three proposed fiber optic repeater sites

- Install approximately 173 miles of OPGW on the Lugo-Mohave 500 kV Transmission Line, as well as approximately 59 miles of OPGW on the Eldorado-Mohave 500 kV Transmission Line

- Modify the ground wire peak of existing suspension towers used as splice locations for the OPGW work; some of these towers would also require minor modificaitons to the steel in the tower body

- Install approximately 1 mile of overhead and underground telecommunications facilities to connect the proposed Newberry Springs Series Capacitor and Ludlow Series Capacitor to SCE's existing system

- Install underground telecommunications facilities at three fiber optic repeater sites within the Lugo-Mohave 500kV Transmission Line ROW

- Install approximately 1,000 feet of underground telecommunications facilities within the existing Lugo, Mohave, and Eldorado Substations

- Install approximately 3 miles of underground telecommunications facilities in the vicinity of Mohave Substation

- Perform modifications within the existing Lugo Substation on the existing series capacitors and install new terminating equipment; remove two existing TSPs within the substation and install two new TSPs within the substation on the Eldorado and Mohave 500 kV Transmission Lines

- Perform modifications within the existing Eldorado Substation on the existing series capacitors and install new terminal equipment on the Lugo 500kV Transmission Line

- Replace existing series capacitors on the Lugo 500 kV Transmission Line, and install new terminal equipment on the Eldorado and Lugo 500 KV transmission Lines at the existing Mohave Substation

For additional project details and equipment positioning, please refer to the project plans, portions of which are provided in Appendix A.

2.2 Project Location

The proposed project is located in California and Nevada, within the Mojave Basin and Range (Mojave) and will extend northeast from Lugo Substation (located in San Bernardino County, California) to Eldorado Substation (located in the City of Boulder City, Nevada) and Mohave Substation (located in Clark County, Nevada), and northwest from Mohave Substation to Eldorado Substation. Portions of the proposed project would also cross through the City of Hesperia, California, Lucerne Valley, California, as well as the unincorporated communities of Searchlight and Laughlin in Nevada. The majority of the proposed project would be constructed within existing SCE easements and fee-owned property, and public franchise areas. SCE would need to acquire additional ROW from the Bureau of Land Management (BLM) to construct the proposed Newberry Springs Capacitor.

For the purpose of this report, noise measurements were taken at eight (8) sites along the route of the proposed transmission lines. For a graphical representation of the noise measurement sites, please refer to the Satellite Aerial Photographs, Figures 1 through 7, following this report.

2.3 Applicable Noise Regulations

The noise regulations that will be considered applicable to this project are contained within the San Bernardino County Development Code, the Clark County Municipal Code, and the City of Hesperia Municipal Code. The City of Boulder City does not have any noise regulations that are applicable to this project. Federal and state regulations have also been reviewed to determine applicability to this project. For pertinent sections of each of the applicable regulations, please refer to Appendix B.

2.3.1 Federal

There are no specific federal regulations limiting noise from public utilities or construction activity on federal land. The Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety* in March 1974, which suggested thresholds of noise at which annoyance and interference can occur at specific locations. For outdoor areas where people spend limited amounts of time, the suggested threshold is 55 dBA L_{EQ}, whereas for outdoor areas in residential areas where people spend largely varying amounts of time, the suggested threshold is 55 L_{DN}. The distinction between these thresholds is that an additional weighting of 10 decibels is applied to nighttime hours when calculating L_{DN}.

2.3.2 State

The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the Proposed Project. Pursuant to CPUC General Order 131-D (G.O. 131-D), Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the county and city regulations are not applicable as neither the county nor the city has jurisdiction over the Proposed Project. Accordingly, the following discussion of local land use regulations is provided for informational purposes only.

2.3.3 Local

As stated above, this project is not subject to jurisdiction of local regulations; however, the following noise limits from local ordinances are recommended to be applied in order to ensure noise impacts generated by the proposed project will be effectively controlled.

<u>San Bernardino County, California</u>

Noise impacts at neighboring properties should meet the noise regulations contained within the San Bernardino County Development Code, which specifies noise limits based on the land use of the properties in question. The Noise Standards for Stationary Noise Sources states that residential properties have noise limits of 55 dBA L_{EQ} between the hours of 7 a.m. and 10 p.m., with noise limits of 45 dBA L_{EQ} between the hours of 10 p.m. and 7 a.m.

The code exempts noise from temporary construction activity from these noise limits, provided that construction activity is limited to between the hours of 7 a.m. and 7 p.m., and is completely prohibited on Sundays and federal holidays.

Clark County, Nevada

The Clark County Municipal Code provides maximum permitted sound levels for each octave band, shown below in Table 1. The code specifically exempts construction and demolition activity from these noise restrictions, provided that it is conducted during daytime hours. SCE proposes to conduct all construction activity in Clark County between the hours of 7 a.m. and 7 p.m., Monday through Saturday, with the possibility of some construction activities occurring during nighttime hours, if required to facilitate outages.

Table 1. Noise-Maximum Permitted Sound Levels (Decibels)

Octave Band Center Frequency (Hertz)	Within Residential Districts		Within Business and Industrial Districts	
	Daytime	Nighttime	Daytime	Nighttime
31.5	72	65	76	65
63	65	58	69	62
125	58	50	62	54
250	53	44	58	49
500	50	40	55	45
1000	47	37	52	42
2000	43	33	49	38
4000	40	30	46	35
8000	37	27	43	32

City of Hesperia, California

The City of Hesperia Municipal Code specifies noise limits based on the land use of the properties in question. Properties zoned A-1 (Limited Agricultural), A-2 (General Agricultural), R-1 (Single-Family Residential), R-3 (Multi-Family Residential) and RR (Rural Residential) have a maximum noise limit of 60 dBA L_{EQ} between the hours of 7 a.m. and 10 p.m., with a noise limit of 55 dBA L_{EQ} between the hours of 10 p.m. and 7 a.m. The code exempts noise from temporary construction activity from these noise limits, provided that it is limited to between the hours of 7 a.m. and 7 p.m., and is completely prohibited on Sundays and federal holidays.

City of Boulder City, Nevada

The City of Boulder City does not have any noise regulations that are applicable to this project.

2.3.4 Typical Criteria

Although there are no specific construction noise limits found within federal, state, or the local codes that are considered applicable for this project, construction noise impacts have still been evaluated in order to determine significance. When separate construction noise limits are established, they typically exceed the normally acceptable noise limits to account for the temporary nature of the impacts. Jurisdictions such as the City of San Diego, County of San Diego, and others establish a construction noise limits of 75 dBA L_{EQ} as measured during a twelve or eight-hour period of time. For purposes of this analysis and the determination of significance, a threshold of

75 dBA L_{EQ} over the time period during which construction will take place during the day has been considered an appropriate construction noise limit.

2.4 Significance Criteria

California Environmental Quality Act (CEQA)

The significance criteria for assessing the impacts from noise are determined from the California Environmental Quality Act (CEQA) Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impact if it would cause:

- Exposure of people 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
- Exposure of people to, or generation of, excessive groundborne vibration or groundborne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- Exposure of people residing or working in the project area to excessive noise levels for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport
- Exposure of people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip

National Environmental Policy Act (NEPA)

Impact significance under NEPA is defined by the Council on Environmental Quality (CEQ) regulations and requires consideration of the temporal scale, spatial extent, and intensity of the change that would be introduced by the Proposed Action. Under NEPA significant effects to noise would occur if the Proposed Action would conflict with regional and local noise regulations when sensitive receptors are located within the action area.

3.0 ENVIRONMENTAL SETTING

3.1 Existing Noise Environment

3.1.1 Ambient Noise

On-site inspections were conducted between Thursday, April 14, 2016 and Saturday, April 16, 2016. Sound level meters were left overnight in seven locations, and brief ambient noise measurements were performed in one additional location. Each of these site visits is summarized below, and satellite photographs with measurement locations are included in Figures 1 through 7.

Lugo Substation Site Visit

The outer perimeter of the Lugo Substation was inspected on April 14, 2016. The overnight monitor was placed to the south of the existing capacitor banks at 12:20 p.m. on April 14, and retrieved at

9:45 a.m. on April 15. Additional short-term measurements performed to determine the noise generated by the existing capacitors are discussed in detail in Section 5.1.2. The primary noise sources observed on site were the existing substation and transmission lines, as well as occasional freight trains on the rail line approximately 1,000 feet to the southeast of the substation. Please refer to Figure 1 for a graphic showing this measurement location.

Arrowhead Lake Road Site Visit

A site inspection of the proposed helicopter landing pad location off of Arrowhead Lake Road near Tower M7-T3 of the Eldorado-Lugo Transmission Line. The overnight monitor was placed approximately 650 feet east of Arrowhead Lake Road at 1:25 p.m. on April 14, and retrieved at 10 a.m. on April 15. The primary noise sources observed on site were wind noise and traffic on Arrowhead Lake Road. Please refer to Figure 2 for a graphic showing this measurement location.

Deep Creek Road Site Visit

A site inspection was performed on April 14, 2016 near the proposed staging area location off of Deep Creek Road near Tower M8-T1 of the Lugo-Mohave Transmission Line. The overnight monitor was placed approximately 180 feet east of Deep Creek Road at 2 p.m. on April 14, and retrieved at 10:20 a.m. on April 15. The primary noise sources observed on site were wind noise, traffic on Deep Creek Road, and recreational off-roading vehicles on the nearby trails. Please refer to Figure 3 for a graphic showing this measurement location.

Ocotillo Way Site Visit

A site inspection was performed on April 14, 2016 near the proposed staging area location off of Ocotillo Way, near Tower M19-T3 of the Eldorado-Lugo Transmission Line. The overnight monitor was placed directly underneath the transmission line tower at 4:15 p.m. on April 14, and retrieved at 10:50 a.m. on April 15. The primary noise sources observed on site were wind noise, freight trains on the rail line to the southwest, and occasional traffic on the nearby roads. Please refer to Figure 4 for a graphic showing this measurement location.

Barstow Road Site Visit

A site inspection was performed on April 14, 2016 near the proposed fiber optic repeater location off of Barstow Road near Tower M30-T3 of the Eldorado-Lugo Transmission Line. The overnight monitor was placed directly underneath the transmission line tower, approximately 450 feet from Barstow Road, at 6:36 p.m. on April 14, and retrieved at 11:10 a.m. on April 15. The primary noise sources observed on site were wind noise and traffic on Barstow Road. Please refer to Figure 5 for a graphic showing this measurement location.

Pisgah Site Visit

A site inspection was performed near the proposed capacitor stations off of Pisgah Road on April 15, 2016. The overnight monitor was placed at 2:10 p.m. on April 15, and retrieved at 12 p.m. on April 16. The meter was placed approximately 500 feet west of Tower M68-T2 of the Lugo Mohave Transmission Line, near Pisgah Road, and approximately 375 feet from Interstate 40. The primary noise sources observed on site were wind noise, traffic on Interstate 40, and freight trains on the nearby rail line. Please refer to Figure 6 for a graphic showing this measurement location.

US-95 Site Visit

A site inspection was performed near the staging area along US-95 on April 15, 2016. The overnight monitor was placed between Towers M160-T1 and M160-T2 of the Lugo Mohave Transmission Line, approximately 35 feet east of US-95 at 11:00 p.m. on April 15, and retrieved at 10 a.m. on April 16. The primary noise sources observed on site were wind noise and traffic on US-95. Please refer to Figure 7 for a graphic showing this measurement location.

Summary of Noise Monitoring Results

Results of this noise monitoring are shown in Table 2, and the noise monitoring locations are shown in Figures 1 through 7. The National Weather Service declared a wind advisory on April 15 due to wind speeds exceeding 30 mph. As a result, some of the ambient noise measurements likely exceeded typical levels. Please refer to Appendix C for a complete list of hourly noise levels measured on the sites.

Table 2. Long-Term Measured Noise Levels near Property Line

Location	Minimum Measured Noise Level		Maximum Measured Noise Level	
	dBA L_{EQ}	Date and Time	dBA L_{EQ}	Date and Time
Lugo Substation	42.3	April 14, 2016 9 p.m. to 10 p.m.	49.5	April 15, 2016 1 a.m. to 2 a.m.
Arrowhead Lake Road	34.6	April 14, 2016 2 p.m. to 3 p.m.	50.2	April 15, 2016 2 a.m. to 3 a.m.
Deep Creek Road	32.7	April 15, 2016 3 a.m. to 4 a.m.	50.7	April 15, 2016 9 a.m. to 10 a.m.
Ocotillo Way	40.3	April 15, 2016 5 a.m. to 6 a.m.	66.4	April 14, 2016 6 p.m. to 7 p.m.
Barstow Road	44.4	April 15, 2016 2 a.m. to 3 a.m.	62.7	April 15, 2016 1 a.m. to 2 a.m.
Pisgah Substation	49.0	April 16, 2016 2 a.m. to 3 a.m.	63.7	April 16, 2016 3 a.m. to 4 a.m.
US-95	57.8	April 16, 2016 2 a.m. to 3 a.m.	72.6	April 16, 2016 9 a.m. to 10 a.m.

3.2 Future Noise Environment

The future noise environment in the vicinity of the project site will be primarily a result of the same noise sources, as well as the noise generated by the new mid-line capacitors near the Pisgah Substation, and the three new fiber optic repeater sites. The noise generated by the new mid-line capacitors is expected to be similar to the capacitor noise measured at the Lugo Substation, under typical weather conditions.

4.0 METHODOLOGY AND EQUIPMENT

4.1 Methodology

4.1.1 Cadna Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using Cadna Version 4.6, which is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. Cadna (Computer Aided Noise Abatement) assists in the calculation, presentation, assessment, and alleviation of noise exposure. It allows for the input of project information such as noise source data, barriers, structures, and topography to create a detailed model and uses the most up-to-date calculation standards to predict outdoor noise impacts. Noise standards used by Cadna that are particularly relevant to this analysis include ISO 9613 (Attenuation of sound during propagation outdoors). Cadna provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss. Further explanation may be provided upon request.

4.1.2 Formulas and Calculations

Decibel Addition

To determine the combined logarithmic noise level of two known noise source levels, the values are converted to the base values, added together, and then converted back to the final logarithmic value, using the following formula:

$$L_C = 10\log(10^{L1/10} + 10^{L2/10} + \ldots 10^{LN/10})$$

where L_C = the combined noise level (dB), and
L_N = the individual noise sources (dB).

This procedure is also valid when used successively for each added noise source beyond the first two. The reverse procedure can be used to estimate the contribution of one source when the contribution of another concurrent source is known and the combined noise level is known. These methods can be used for L_{EQ} or other metrics (such as L_{DN} or CNEL), as long as the same metric is used for all components.

Distance Attenuation

Attenuation due to distance is calculated by the equation:

$$SPL_2 = SPL_1 - 20\log(\frac{D_2}{D_1})$$

where SPL_1 = Known sound pressure level at known distance,
SPL_2 = Calculated sound pressure level at distance,
D_1 = Distance from source to location of known sound pressure level, and
D_2 = Distance from source to location of calculated sound pressure level.

This is identical to the more commonly used reference of 6 dB reduction for every doubling of distance. This equation does not take into account reduction in noise due to atmospheric absorption.

4.2 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing ambient and equipment noise levels:

- Larson Davis Model 720 Type 2 Integrating Sound Level Meters, Serial Numbers 0462, 0190, 0309, and 0219
- Larson Davis Model CA150 Type 2 Calibrator, Serial Number 2625
- Larson Davis Sound Expert LxT Type 1 Sound Level Meters, Serial Numbers 4084 and 4085
- Larson Davis Model CA250 Calibrator, Serial Number 1081
- Microphone with windscreen, tripod

The sound level meters were field-calibrated immediately prior to the noise measurement and checked afterwards, to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with sound level meters that conform to the American National Standards Institute specifications for sound level meters (ANSI S1.4). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

5.0 NOISE IMPACTS

In order to determine whether noise generated by the proposed project would create significant noise impacts, operational noise and temporary construction noise have been evaluated using Cadna software. Detailed Cadna data sheets are provided in Appendix D.

5.1 Operational Noise Sources

5.1.1 Transmission Line Noise

High voltage transmission lines produce an audible noise due to corona discharge. This noise is composed primarily of the broadband high frequency buzzing or crackling produced from low current discharges into the air around the transmission lines. The intensity of the corona noise is determined by the voltage of the transmission lines, as well as the characteristics of the conductors including the shape, diameter, distance between phases, and other factors. Corona noise increases in high humidity, and reaches its maximum during heavy rain. The Bonneville Power Administration (BPA), located in Portland, Oregon, studied noise levels of 500 kV transmission lines, and determined an average L_{50} noise level of 49 dBA, plus or minus two decibels, during rain at the edge of the right-of-way (65 feet from the base of the tower). The BPA report determined that the fair weather noise levels are typically about 25 decibels lower than during rain. This is consistent with the observations of the site visits performed by Eilar Associates. While the corona noise was faintly audible in some locations, it was not measureable over the background noise from wind, traffic, and other ambient noise sources.

Assuming that the transmission lines operate at a constant noise level of 49 dBA for a full 24-hour period, this would equate to an L_{DN} of 55 dBA. This does not exceed the EPA recommended

threshold of 55 dBA L_{DN}, which indicates potential for annoyance and interference with outdoor activity. Furthermore, this is considered to be the worst-case noise impact from the transmission lines, and will only occur during rain, when ambient noise levels are already raised. Typical noise levels that are expected in the arid environments that the transmission lines pass through are expected to be substantially lower. For these reasons, noise impacts generated by transmission lines are expected to be less than significant at off-site receivers.

No changes are anticipated that would alter the current noise levels produced by the transmission lines, except where small sections of additional transmission lines will be constructed at the Pisgah Capacitor Stations. Therefore, the project is not expected to produce an increase in the ambient noise environment in areas where transmission lines already exist.

5.1.2 Capacitor Station Noise

Noise from capacitor banks is similar to the corona discharge noise of transmission lines; however, there is less existing research on the audible noise produced by capacitor banks. Noise analysis of the capacitors in this report is based on measurements performed by Eilar Associates.

The existing capacitor banks at the Lugo Substation were measured during the site visit on April 14, 2016. Two measurements were performed outside of the substation perimeter; one at approximately 215 feet from the capacitors, and one at approximately 390 feet from the capacitors. Due to interference from ambient noise sources, the third-octave band noise level data were reviewed to determine the specific contribution of the capacitor noise to the overall measured noise level. The capacitor noise was primarily measured to be between 1 to 16 kHz at each of the locations. Based on these observations, the noise levels generated by capacitors were considered to be approximately 43.6 dBA at 215 feet, and 37.9 dBA at 400 feet, showing an attenuation of 5.7 decibels with the increased distance from the noise source. This demonstrates that the noise measured at these locations can be used to model the capacitor bank noise as a single point source.

While existing capacitors located at the Lugo, Eldorado, and Mohave Substations will be replaced as a part of this project, the noise levels generated by the new capacitors is not expected to change significantly. The noise impacts resulting from the new capacitor stations near the Pisgah Substation were analyzed assuming similar noise levels to those measured at the Lugo Substation. Three potential locations were originally proposed for both the Newberry Springs Capacitor (Sites 1, 2, and 3) and the Ludlow Capacitor (Sites 4, 5, and 6). From these six potential sites, two were eliminated in the Siting Summary Report, dated January 2016. The remaining options include the Preferred Sites 2 and 5, and the Alternative Sites 1 and 4.

The combined noise impacts were calculated for the Preferred Sites and separately for the Alternative Sites. The analysis modeled three capacitor banks at each of the sites, and also considered noise from twenty vehicle trips per hour on the access roads. The results of this analysis are shown below in Table 3.

Table 3. Capacitor Station Noise Impacts at Edges of Capacitor Stations			
Receiver Location	**Receiver Number**	**Receiver Location**	**Equipment Noise Level (dBA L_{EQ})**
Newberry Springs Capacitor Site 2 (Preferred)	R1	Northwest Edge of Station	52
	R2	Southeast Edge of Station	52
Ludlow Capacitor Site 4 (Preferred)	R3	Northwest Edge of Station	53
	R4	Southeast Edge of Station	52
Newberry Springs Capacitor Site 1 (Alternative)	R5	Northwest Edge of Station	53
	R6	Southeast Edge of Station	51
Ludlow Capacitor Site 5 (Alternative)	R7	Northwest Edge of Station	52
	R8	Southeast Edge of Station	52

While the proposed capacitor station sites are located within the County of San Bernardino, noise from construction activities is exempt from meeting the noise level limits contained within the San Bernardino County Development Code as proposed construction activities in the vicinity of these sites are only expected to occur during the daytime hours on Monday through Saturday. For this reason, the EPA recommended hourly noise threshold has been applied for receivers in the vicinity of the proposed capacitor station sites. All noise levels in Table 3 are below the EPA recommended hourly noise threshold of 55 dBA L_{EQ}, which indicates potential for annoyance and interference with outdoor activity. Therefore, any receivers located directly on the edges of the capacitor sites are not expected to be significantly impacted by noise from the standard operation of the capacitor sites. For a graphical representation of noise contours and receiver locations, please refer to Figures 8 and 9.

Based on the above analysis, there is no significant difference in the noise impacts associated with the preferred or alternative capacitor sites. It should also be noted that there are no sensitive receivers in the vicinity of any the sites.

5.1.3 Fiber Optic Repeater Sites

The new fiber optic repeater sites will include a generator and fiber optic equipment inside of an equipment shelter, and will be served by two air conditioning units, mounted on the exterior of the buildings, and configured for redundancy, where only one unit will operate at any given time. The generators will only operate in the event of an emergency power failure, or for brief testing and maintenance performed on a regular basis during daytime hours. The generator noise is also expected be contained by the placement of the generators inside the proposed equipment shelters. For these reasons, noise levels created by the generators is not considered in this analysis.

Final engineering has not been completed for the equipment shelters, and therefore, typical assumptions were made for the associated air conditioning equipment. Based on past experience

with fiber optic telecommunications sites, Eilar Associates has selected the Marvair ComPac II unit as a typical, representative air conditioning unit that could be used in this type of installation. An existing ComPac II unit was measured by Eilar Associates at a distance of five feet for a past project. The measured noise levels are shown in Table 4. No other equipment on the fiber optic repeater sites is anticipated to generate significant levels of noise.

Table 4. Sound Pressure Level of Typical Air Conditioning Equipment at 5 feet

Source	Sound Pressure Level at Octave Band Frequency (dB)								Sound Pressure Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Marvair Compac II	79.9	77.5	75.5	70.5	70.6	66.8	59.6	55.2	74.8

Barstow Fiber Optic Repeater Site

The Barstow Fiber Optic Repeater site is located about eight miles north of Lucerne along Barstow Road (Hwy 247). The site is approximately 2,000 feet east of the intersection of Barstow Road (Hwy 247) and Lugo-Mohave 500 kV transmission line, within the boundary of the transmission line right-of-way. This site is located within San Bernardino County, and therefore the most restrictive hourly average noise limit of 45 dBA during nighttime hours has been applied for surrounding properties. Noise impacts were evaluated to the north and south of the equipment shelter at the edge of the existing right-of-way. The results of this analysis are shown below in Table 5.

Table 5. Barstow Fiber Optic Repeater Site Equipment Noise Impacts

Receiver Number	Receiver Location	Approximate Horizontal Distance to Equipment (ft)	Nighttime Hourly Noise Limit (dBA L_{EQ})	Equipment Noise Level (dBA L_{EQ})
R1	North, Edge of Right-of-Way	140	45	43
R2	South, Edge of Right-of-Way	165	45	42

As shown in Table 5, noise impacts generated by the anticipated air conditioning equipment at the Barstow Fiber Optic Repeater Site are not expected to exceed the nighttime residential property line noise limits the County of San Bernardino at the nearest edges of the existing right-of-way. As this noise limit is the most restrictive applicable limit for the neighboring properties, these noise impacts are considered to be less than significant. Noise contours and receiver locations are shown in Figure 10.

Kelbaker Fiber Optic Repeater Site

The Kelbaker Fiber Optic Repeater site is located about eight miles south of Kelso, California along Kelbaker Road. The site is approximately 600 feet east of the intersection of Kelbaker Road and the existing Lugo-Mohave 500 kV transmission line, within the boundary of the transmission line right-of-way. This site is located within the Mojave National Preserve, and therefore does not have a specific applicable noise regulation. However, the EPA threshold of 55 dBA L_{EQ} was used to evaluate the significance of the noise impacts, as there are no permanent receivers in the vicinity of the station. Noise impacts were evaluated to the north and south of the equipment shelter at the edge of the existing right-of-way, as well as at the nearby field office of the Pacific Lighting Service Company, to the west of the site. The results of this analysis are shown below in Table 6.

Table 6. Kelbaker Fiber Optic Repeater Site Equipment Hourly Noise Impacts

Receiver Number	Receiver Location	Approximate Horizontal Distance to Equipment (ft)	Hourly Noise Limit (dBA L_{EQ})	Equipment Noise Level (dBA L_{EQ})
R1	North, Edge of Right-of-Way	30	55	51
R2	South, Edge of Right-of-Way	145	55	44
R3	Pacific Lighting Service Company Property	150	55	43

As shown in Table 6, noise impacts generated by the anticipated air conditioning equipment at the Kelbaker Fiber Optic Repeater Site are not expected to exceed the hourly noise significance thresholds determined by the EPA at the nearest edges of the existing right-of-way, or at the neighboring utility company property. Noise contours and receiver locations are shown in Figure 11.

Lanfair Fiber Optic Repeater Site

The Lanfair Fiber Optic Repeater site is located about three miles north of Goffs along Lanfair Road, the site is approximately 2,000 feet east of Lanfair Road and the existing Lugo-Mohave 500 kV transmission line, within the boundary of the transmission line right-of-way. This site is located within the Mojave National Preserve, and therefore does not have a specific applicable noise regulation. However, the EPA threshold of 55 dBA L_{EQ} was used to evaluate the significance of the noise impacts, as there are no permanent receivers in the vicinity of the station. Noise impacts were evaluated to the north and south of the equipment shelter at the edge of the existing right-of-way. The results of this analysis are shown below in Table 7.

Table 7. Lanfair Fiber Optic Repeater Site Equipment Hourly Noise Impacts

Receiver Number	Receiver Location	Approximate Horizontal Distance to Equipment (ft)	Hourly Noise Limit (dBA L_{EQ})	Equipment Noise Level (dBA L_{EQ})
R1	North, Edge of Right-of-Way	30	55	51

Table 7. Lanfair Fiber Optic Repeater Site Equipment Hourly Noise Impacts				
Receiver Number	**Receiver Location**	**Approximate Horizontal Distance to Equipment (ft)**	**Hourly Noise Limit (dBA L_{EQ})**	**Equipment Noise Level (dBA L_{EQ})**
R2	South, Edge of Right-of-Way	150	55	43

As shown in Table 7, noise impacts generated by the anticipated air conditioning equipment at the Lanfair Fiber Optic Repeater Site are not expected to exceed the hourly noise significance thresholds determined by the EPA at the nearest edges of the existing right-of-way, or at the neighboring utility company property. Noise contours and receiver locations are shown in Figure 12.

5.1.4 Emergency Backup Generators

As a part of this project, emergency backup generators will be installed at capacitor and repeater sites, in case of an emergency power outage. These generators are not expected to be operational except in the event of a power failure, although they will typically run for 15 minutes once a month, during mid-day on a weekday, for test and maintenance purposes. As these generators will only operate in case of an emergency power outage, and for brief periods during the daytime hours on a weekday for test and maintenance purposes, they are considered to be temporary noise sources. Additionally, these generators are located on sites with large setback distances to any potential surrounding sensitive receivers. For these listed reasons, noise from the operation of emergency backup generators at capacitor and repeater sites is not expected to exceed any local noise standards.

5.2 Temporary Construction Noise

Project-related construction activity is anticipated to take place over the course of approximately 21 months. This will involve several different types of construction, including the installation of the new capacitors, pulling and tensioning of transmission lines, and modifications involved in mitigating infractions at existing transmission lines, among other activities. Noise levels generated by representative construction activity have been evaluated for the purposes of determining the significance of noise impacts from construction and the feasibility and reasonableness of mitigating any significant impacts, if necessary.

As detailed in Section 2.3.4, the local governments in the project area restrict the hours of construction, but not the construction noise levels produced, which is why the 75 dBA L_{EQ} work day threshold has been implemented. Construction activity within San Bernardino County, Hesperia, and Boulder City will occur between the hours of 7 a.m. and 7 p.m., and therefore, construction noise impacts evaluated in these areas will be averaged over a 12-hour period. Construction in Clark County will occur between 6 a.m. and 10 p.m., and therefore, construction noise impacts evaluated in this area will be averaged over a 16-hour period.

Noise levels of construction equipment involved in the analyzed activities are listed below in Table 8. Unless otherwise noted, all noise levels have been provided by the DEFRA Construction Equipment Noise Database (see reference).

Table 8. Construction Equipment Noise Levels	
Equipment	**Noise Level at 50 feet (dBA)**
Pickup Truck, 4x4	55.0[1]
Boom/Crane Truck	74.3
Truck, Semi Tractor	76.3
Track Type Dozer	77.3
Puller/Tensioner	74.3
Dump Truck	70.3

[1]Source: FHWA Construction Noise Database

In remote areas with limited vehicle access, a Hughes 500 E helicopter or equivalent will be utilized to transport crews and equipment, and assist in various construction activities. According to manufacturer data sheets for a Hughes 500 C, while hovering stationary at a height of 200 feet, the maximum noise level measured on the ground is 89.8 dBA. For this analysis, the helicopter was assumed to operate at an average height of 200 feet. The helicopter will also require the use of a support truck for refueling. This support truck is assumed to be similar to a typical semi-truck.

Helicopter Landing Zone at Towers M7-T3 and M7-T4

Noise levels generated at the helicopter landing pad location near the intersection of the transmission lines and Arrowhead Lake Road (near Tower M7-T3 of the Eldorado-Lugo Transmission Line and Tower M7-T4 of the Lugo-Mohave Transmission Line) were evaluated. This landing zone is located in an existing SCE right-of-way, but is directly adjacent to several residences. Noise impacts from helicopter operation were analyzed at the nearby residential structures. The noise impacts were evaluated assuming two different daily duty cycles. The first model assumes that the helicopter would operate in the vicinity of this landing zone for 50% of a given 12-hour work day, and the second assumes that the helicopter would operate in the vicinity of this landing zone for 20% of a given 12-hour work day. The helicopter was assumed to spend the remaining hours traveling or sitting nonoperational on a construction site. Considering these assumptions, calculated noise impacts at nearby residences are listed below in Table 9.

Table 9. Noise Impacts from Helicopter Landing Zone at Towers M7-T3 and M7-T4					
Receiver Number	**Receiver Location**	**Approximate Horizontal Distance to Landing Zone (ft)**	**12-hour Noise Threshold (dBA L_{EQ})**	**Equipment Noise Level (dBA L_{EQ})**	
				Helicopter On Site 50% of Day	**Helicopter On Site 20% of Day**
R-1	Residence 1	475	75	**79**	75
R-2	Residence 2	675	75	**76**	72
R-3	Residence 3	950	75	73	69
R-4	Residence 4	500	75	74	74

As shown in Table 9, noise impacts at nearby residences due to helicopter operation are not expected to exceed an average noise level of 75 dBA L_{EQ} over a 12-hour workday assuming that the helicopter does not operate in the vicinity of the landing zone for more than 20% of that time period. Noise contours and receiver locations for the scenario that assumes the helicopter will operate in the vicinity of this landing zone for 50% of the workday as well as for the scenario that assumes the helicopter will operate at this landing zone for 20% for the workday are provided as Figures 13 and 14, respectively.

In order to reduce noise impacts associated with this helicopter landing zone, Southern California Edison will implement Applicant Proposed Mitigation (APM) measure NOI-1, limiting helicopter use in this area to two hours per day during construction.

Helicopter Landing Zone at Tower M16-T4

The helicopter landing pad location near Tower M16-T4 was evaluated. This landing zone is located in an existing SCE right-of-way, but is near several residences. Noise impacts from helicopter operation were analyzed at the nearby residential structures. The helicopter was assumed to operate in the vicinity of this landing zone for 50% of a given 12-hour work day, and spend the remaining nine hours traveling or sitting nonoperational on a construction site. The noise impacts at nearby residences are listed below in Table 10.

Table 10. Noise Impacts from Helicopter Landing Zone at Tower M16-T4

Receiver Number	Receiver Location	Approximate Horizontal Distance to Landing Zone (ft)	12-hour Noise Threshold (dBA)	Equipment Noise Level (dBA)
R-1	Residence 1	900	75	72
R-2	Residence 2	1050	75	71
R-3	Residence 3	1200	75	69
R-4	Residence 4	1400	75	68

As shown in Table 10, noise impacts at nearby residences due to helicopter operation are not expected to exceed an average noise level of 75 dBA over a 12-hour workday. Noise contours and receiver locations are provided as Figure 15.

As the two landing zones analyzed above are in closest proximity to residential receivers and are shown to fall below the established 75 dBA workday threshold, all other helicopter landing pads included in this project are also expected to have less than significant noise impacts at neighboring residential receivers, assuming the helicopter does not operate in close proximity to residential receivers for more than 20% of the 12-hour workday near Towers M7-T3 and M7-T4, and for more than 50% of the 12-hour workday near Tower M16-T4.

Pulling/Tensioning Site at Towers M2-T1 and M173-T3

Noise levels generated at the transmission line pulling and tensioning site at Towers M2-T1 of the Eldorado-Mohave Transmission Line and M173-T3 of the Lugo-Mohave Transmission Line were

also evaluated. This site is located in an existing SCE right-of-way, but is located near a residential subdivision in Laughlin, Nevada. As the construction equipment will be located uphill from the residences, this analysis considers sound attenuation that will be achieved due to distance as well as noise shielding from topography.

The analysis assumed that a puller and a tensioner would operate on opposite sides of the tower. No specific noise data were available for this equipment, so both the puller and tensioner were modeled as having similar noise characteristics to a large crane. Additional equipment on site included three flatbed trucks, two dump trucks, a bulldozer, and a rough terrain mobile crane. It is not clear if this site will require the use of a helicopter, and therefore, construction noise impacts were calculated with and without the helicopter and helicopter support truck. In the "with helicopter" scenario, the helicopter was assumed to operate in the vicinity of this tower for 75% of a given 12-hour work day. The noise impacts at nearby residences are listed below in Table 11.

Table 11. Noise Impacts from Pulling/Tensioning Site at Towers M2-T1 and M173-T3

Receiver Number	Receiver Location	Approximate Horizontal Distance to Landing Zone (ft)	12-hour Noise Threshold (dBA)	Equipment Noise Level (dBA)	
				With Helicopter	Without Helicopter
R-1	Residence 1	900	75	75	48
R-2	Residence 2	1050	75	72	46
R-3	Residence 3	1200	75	70	45
R-4	Residence 4	1400	75	73	48

As shown in Table 11, noise impacts at the nearest residences are not anticipated to exceed the significance threshold with or without the use of a helicopter on the project site. This site represents the pulling/tensioning site nearest to residential receivers included in this project, and therefore, any pulling/tensioning activity included in this project is also expected to have a less than significant noise impact at neighboring residential receivers. Noise contours and receiver locations for the scenarios with and without the use of the helicopter are provided as Figures 16 and 17, respectively.

In order to reduce noise impacts associated with this helicopter landing zone, Southern California Edison will implement Applicant Proposed Mitigation Measure NOI-2 to further reduce the impacts of helicopter noise in residential areas.

Pulling/Tensioning Site at Tower M9-T1

Noise levels generated at the transmission line pulling and tensioning site at Towers M9-T1 of the Eldorado-Lugo and Lugo-Mohave Transmission Lines were also evaluated. This site is located in an existing SCE right-of-way. The nearest noise-sensitive receiver locations are residential properties to the north of Towers M9-T1. In addition to noise from equipment at the pulling/tensioning site, there are three helicopter landing zones in the vicinity of this tower, Landing Zones 12 (south of Tower M8-T3 of the Lugo-Mohave Transmission Line), 13 (north of Tower M8-T4 of the Eldorado-Lugo Transmission Line), and 14 (south of Tower M9-T1 of the Lugo-Mohave Transmission Line).

The analysis of noise impacts from construction activities at Tower M9-T1 used the same equipment assumptions as the M2-T1 pulling/tensioning site; however, a separate noise analysis was conducted with the helicopter in use at each landing zone for a full 12-hour workday, while the pulling/tensioning equipment is in use. Considering these assumptions, calculated noise impacts at nearby receivers with the pulling/tensioning equipment in use, and the helicopter operating for a full workday at Landing Zones 12, 13, and 14 are listed below in Tables 12, 13, and 14, respectively.

Table 12. Noise Impacts from Pulling/Tensioning Site at Tower M9-T1 – Helicopter in Use at Landing Zone 12

Receiver Number	Receiver Location	Approximate Horizontal Distance to Landing Zone (ft)	12-hour Noise Threshold (dBA)	Equipment Noise Level (dBA)
R-1	Residence 1	1050	75	73
R-2	Residence 2	1600	75	69

Table 13. Noise Impacts from Pulling/Tensioning Site at Tower M9-T1 – Helicopter in Use at Landing Zone 13

Receiver Number	Receiver Location	Approximate Horizontal Distance to Landing Zone (ft)	12-hour Noise Threshold (dBA)	Equipment Noise Level (dBA)
R-1	Residence 1	1400	75	71
R-2	Residence 2	1130	75	73

Table 14. Noise Impacts from Pulling/Tensioning Site at Tower M9-T1 – Helicopter in Use at Landing Zone 14

Receiver Number	Receiver Location	Approximate Horizontal Distance to Landing Zone (ft)	12-hour Noise Threshold (dBA)	Equipment Noise Level (dBA)
R-1	Residence 1	2700	75	61
R-2	Residence 2	1860	75	65

As shown in Tables 12, 13, and 14, noise impacts at the nearest residences are anticipated to comply with the applicable noise threshold, with the helicopter in use for a full workday at any of the landing zones in the vicinity of the pulling/tensioning site at Tower M9-T1. Noise contours and receiver locations for the scenarios with the helicopter in use for a full workday at Landing Zones 12, 13, and 14 are provided as Figures 18, 19, and 20, respectively.

In order to reduce noise impacts associated with these helicopter landing zones, Southern California Edison will implement Applicant Proposed Mitigation Measure NOI-2 to further reduce the impacts of helicopter noise in residential areas.

Applicant Proposed Mitigation Measures

Southern California Edison has designed and incorporated the following mitigation measures into the Proposed Project to avoid or minimize potential impacts associated with noise.

NOI-01: Duration of Helicopter Use. Active helicopter operation at landing zones within 700 feet of occupied residences would be limited to 2 hours per day. Helicopter use may be extended if required to ensure that electrical service is maintained for customers for safety reasons.

NOI-02: Helicopter Use in Residential Areas. Helicopters would be required to maintain a height of at least 500 feet when passing over residential areas, except at temporary construction areas or when actively assisting with conductor stringing. All helicopters would be required to maintain a lateral distance of at least 500 feet from all schools.

General Construction Recommendations

With the implementation of applicant proposed mitigation measures NOI-1 and NOI-2, no significant noise impacts are expected as a result of the construction activity; however, the project should employ typical construction noise reduction methods in addition to these measures, including but not limited to the following:

1. Turn off equipment when not in use.

2. Limit the use of enunciators or public address systems, except for emergency notifications.

3. Equipment used in construction should be maintained in proper operating condition, and all loads should be properly secured, to prevent rattling and banging.

4. Schedule work to avoid simultaneous construction activities that both generate high noise levels.

5. Use equipment with effective mufflers.

6. Minimize the use of backup alarms.

With the implementation of applicant proposed mitigation measures NOI-1 and NOI-2, these general construction mitigation methods in place, and with construction limited to the allowable hours detailed within this report, it is determined that construction noise impacts associated with this project are expected to be less than significant at noise-sensitive receivers in the vicinity of the project sites. Construction noise impacts are temporary in nature, and are expected to remain below reasonable thresholds for temporary construction noise.

5.3 CEQA Significance Determination

Noise impacts to and from the project site are summarized below and classified per the noise portion of the CEQA Environmental Checklist form. This list summarizes conclusions made within the report and classifies the level of significance as: Potentially Significant Impact, Less than Significant with Mitigation Incorporated, Less than Significant Impact, or No Impact.

Italics are used to denote language from the CEQA Environmental Checklist form.

XII. NOISE—Would the project result in:

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?

Less Than Significant Impact. As documented herein, operational noise impacts from the proposed project are not expected to exceed any of the local noise regulations. The local noise regulations limit the hours of construction activity, but do not limit the specific noise levels produced during construction.

For these reasons, this impact can be classified as less than significant.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. Worst-case groundborne vibration impacts would be expected to result from the installation or modification of transmission line towers. However, this activity would be brief, and is not expected to occur in close enough proximity to sensitive receivers to cause annoyance or damage. No measurable groundbourne vibration is anticipated due to operational activity.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. The noise levels at the existing Eldorado, Lugo, and Mohave Substations are not expected to change significantly, and the modifications to the existing transmission lines are not expected to result in significant changes to the noise at the edges of SCE right-of-way. The ambient noise in close proximity to the two new capacitor stations and the three new fiber optic repeater sites is expected to increase; however this is not expected to have a significant impact outside of the existing SCE right-of-way.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. As shown in Section 5.3 of this report, noise from temporary construction activity is expected be less than significant considering the anticipated construction schedule and assuming that equipment is maintained in proper operating condition and using appropriate mufflers. If helicopters are operated in close proximity to specific sensitive receivers for periods exceeding 20-50% of the workday, the significance threshold may be exceeded. However, this would not be expected to occur, as SCE would implement the recommended measures (applicant proposed mitigation measures NOI-1 and NOI-2) contained herein, in order to reduce impacts to sensitive receivers. Additionally, no construction activity will take place during the more sensitive nighttime hours when ambient noise levels tend to be lower, as per local regulations. Therefore, this impact is deemed to be less than significant.

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?

No Impact. The project site is not located within an airport land use plan nor is it located within two miles of a public airport or public use airport. Therefore, the proposed project would not expose people working in the project area to excessive noise levels from such uses.

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?

No Impact. The project site is not located within the vicinity of a private airstrip. Therefore, the proposed project would not expose people working in the project area to excessive noise levels from such uses.

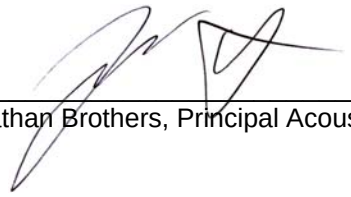
6.0 CONCLUSION

Calculations show that, with the implementation of applicant proposed mitigation measures NOI-1 and NOI-2, the general construction mitigation methods listed above in place, and with construction limited to the allowable hours detailed within this report, it is determined that construction noise impacts associated with this project are expected to be less than significant at noise-sensitive receivers in the vicinity of the project sites. Construction noise impacts are temporary in nature, and are expected to remain below reasonable thresholds for temporary construction noise.

This analysis is based upon a current worst-case scenario of anticipated equipment noise levels. Substitution of equipment with higher noise emission levels may invalidate the recommendations of this study. These conclusions and recommendations are based on the best and most current project-related information available at the time this study was prepared.

7.0 CERTIFICATION

This report is based on the related project information received and measured noise levels, and represents a true and factual analysis of the acoustical impact issues associated with the Eldorado-Lugo-Mohave Series Capacitor Project, located in California and Nevada, within the Mojave Basin and Range (Mojave). This report was prepared by Jeff Russert and Jonathan Brothers and updated by Jonathan Brothers.



Jonathan Brothers, Principal Acoustical Consultant

8.0 REFERENCES

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3. City of Hesperia Municipal Code.

4. County of San Bernardino Development Code.

5. Clark County Municipal Code.

6. Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control*, Acoustical Society of America, 3rd Edition, 1998.

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FIGURES

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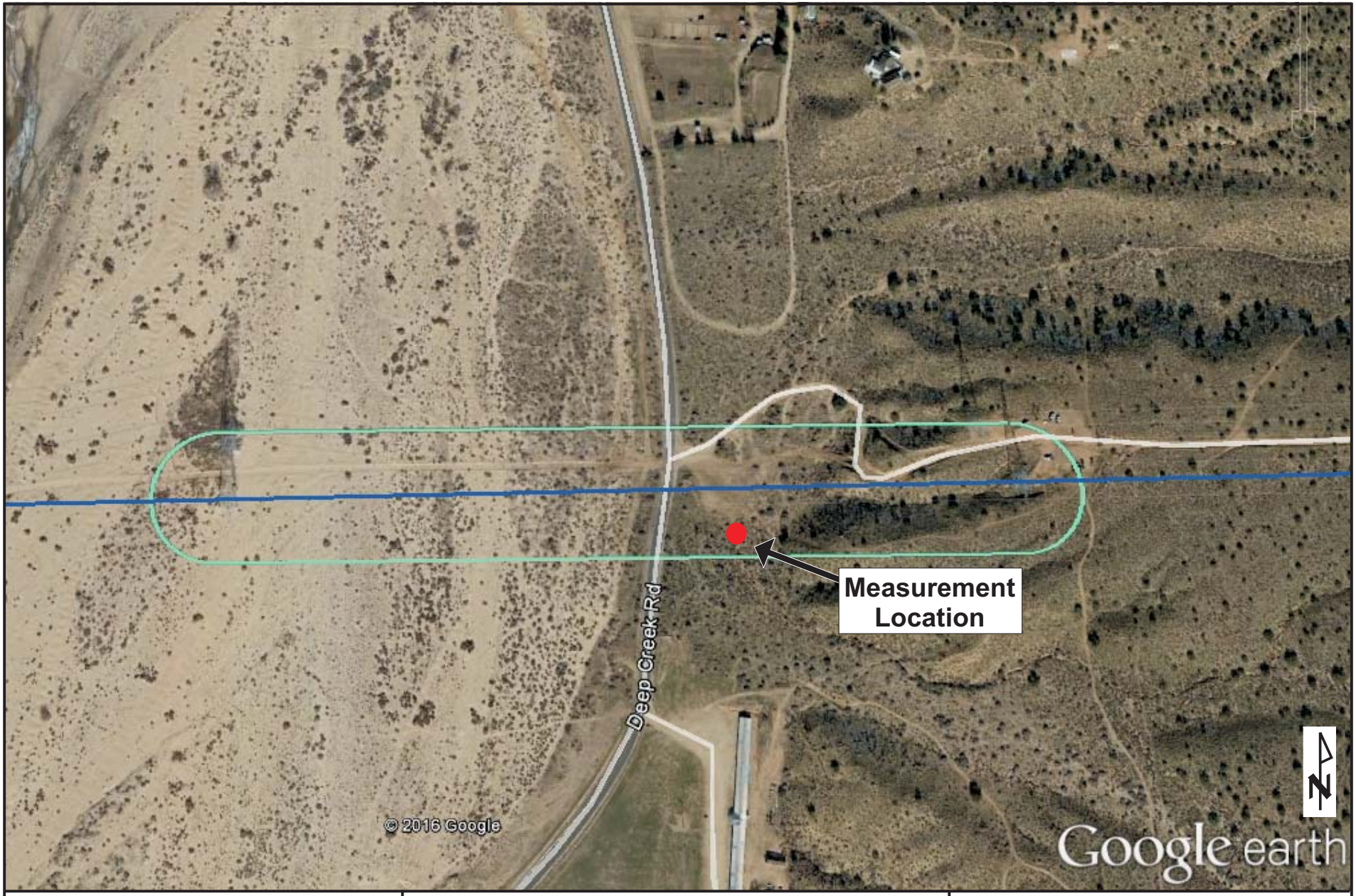
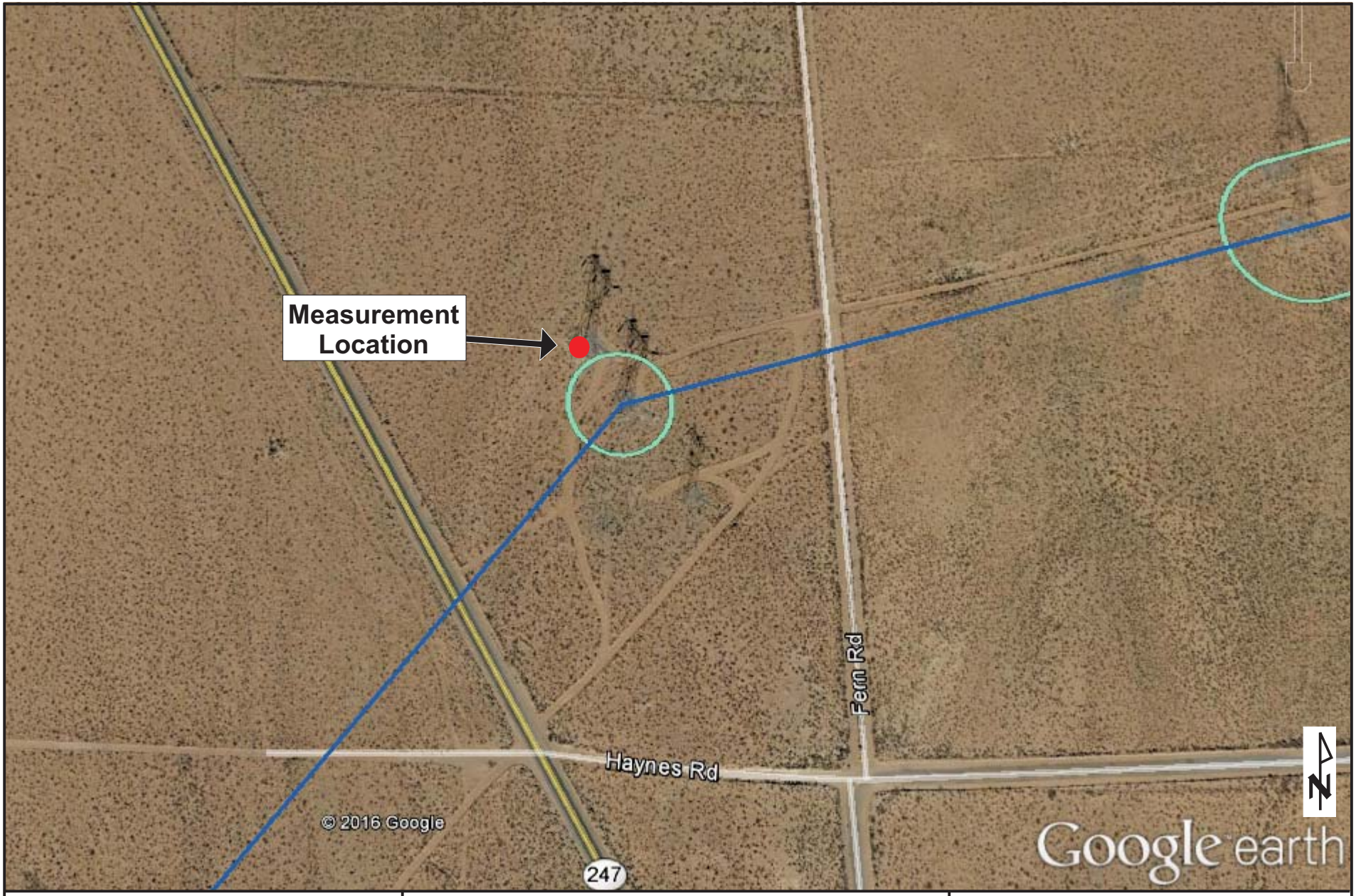
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph** **Lugo Substation** **Job # B60102N1**	**Figure 1**

Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Arrowhead Lake Road Job # B60102N1	Figure 2

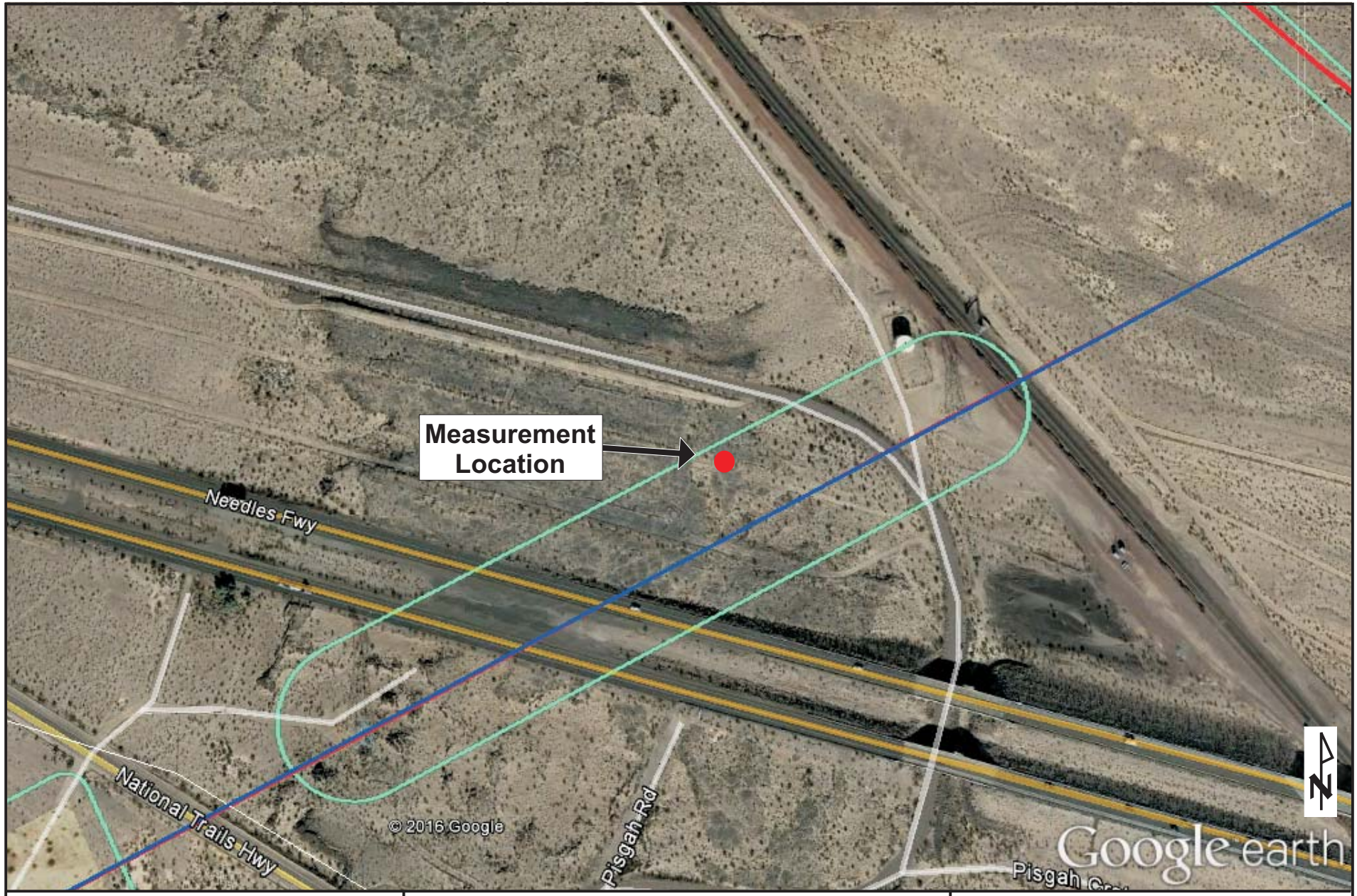


Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Deep Creek Road Job # B60102N1	Figure 3

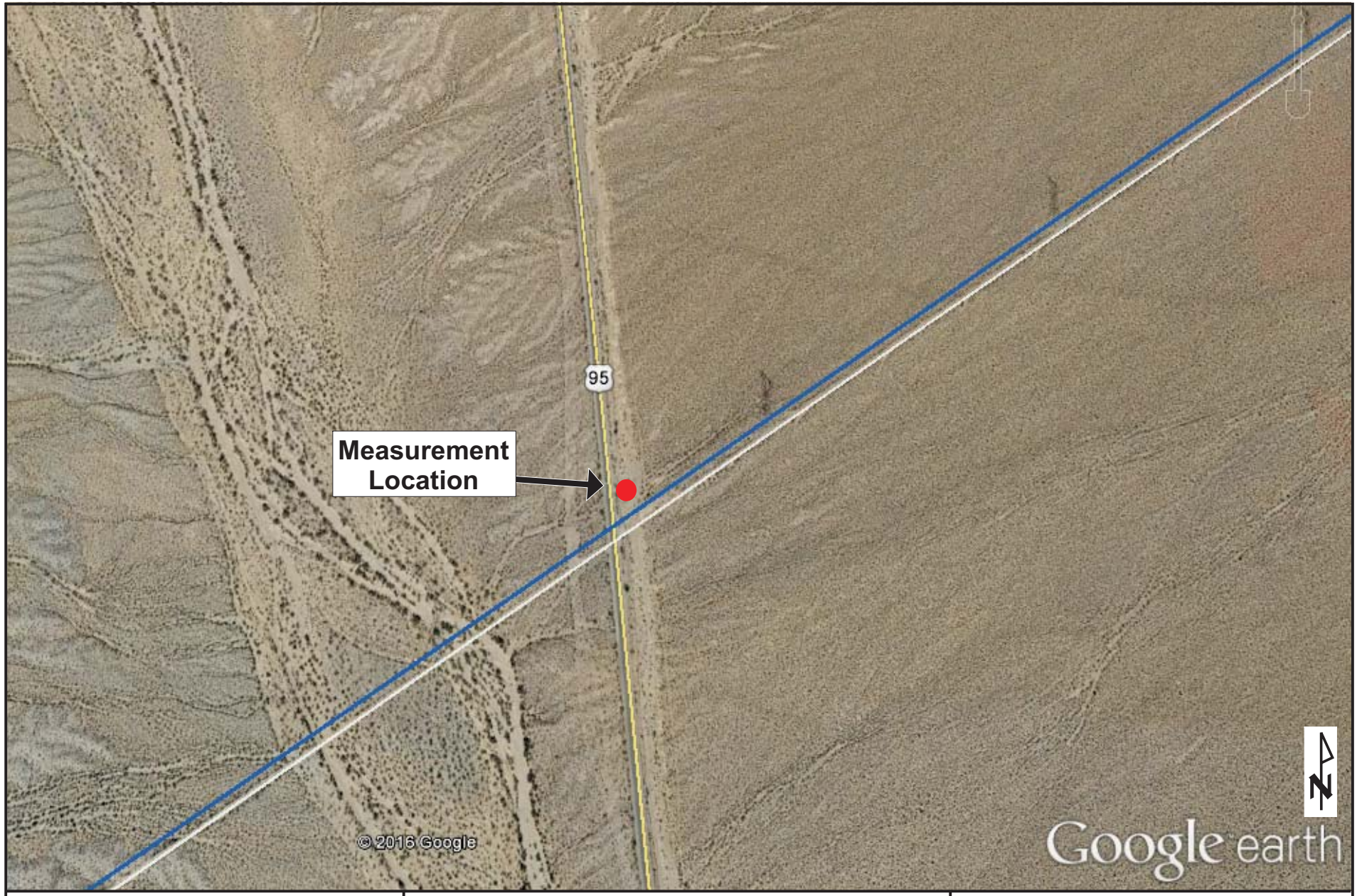
Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Ocotillo Way Job # B60102N1	Figure 4



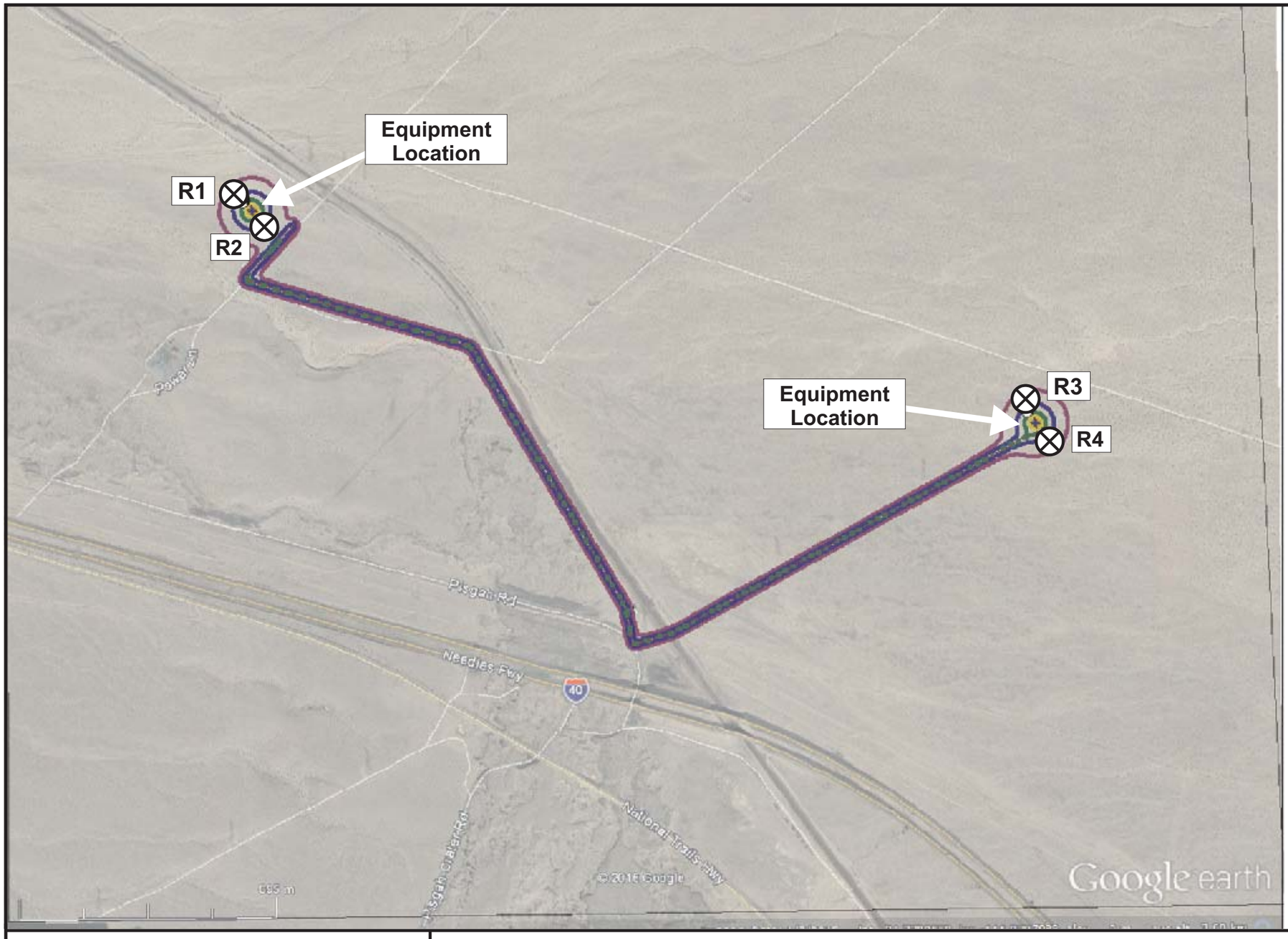
Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Barstow Road Job # B60102N1	Figure 5



Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Pisgah Substation Job # B60102N1	Figure 6



Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph US-95 Job # B60102N1	Figure 7



>= 40.0
>= 45.0
>= 50.0
>= 55.0
>= 60.0
>= 65.0
>= 70.0
>= 75.0

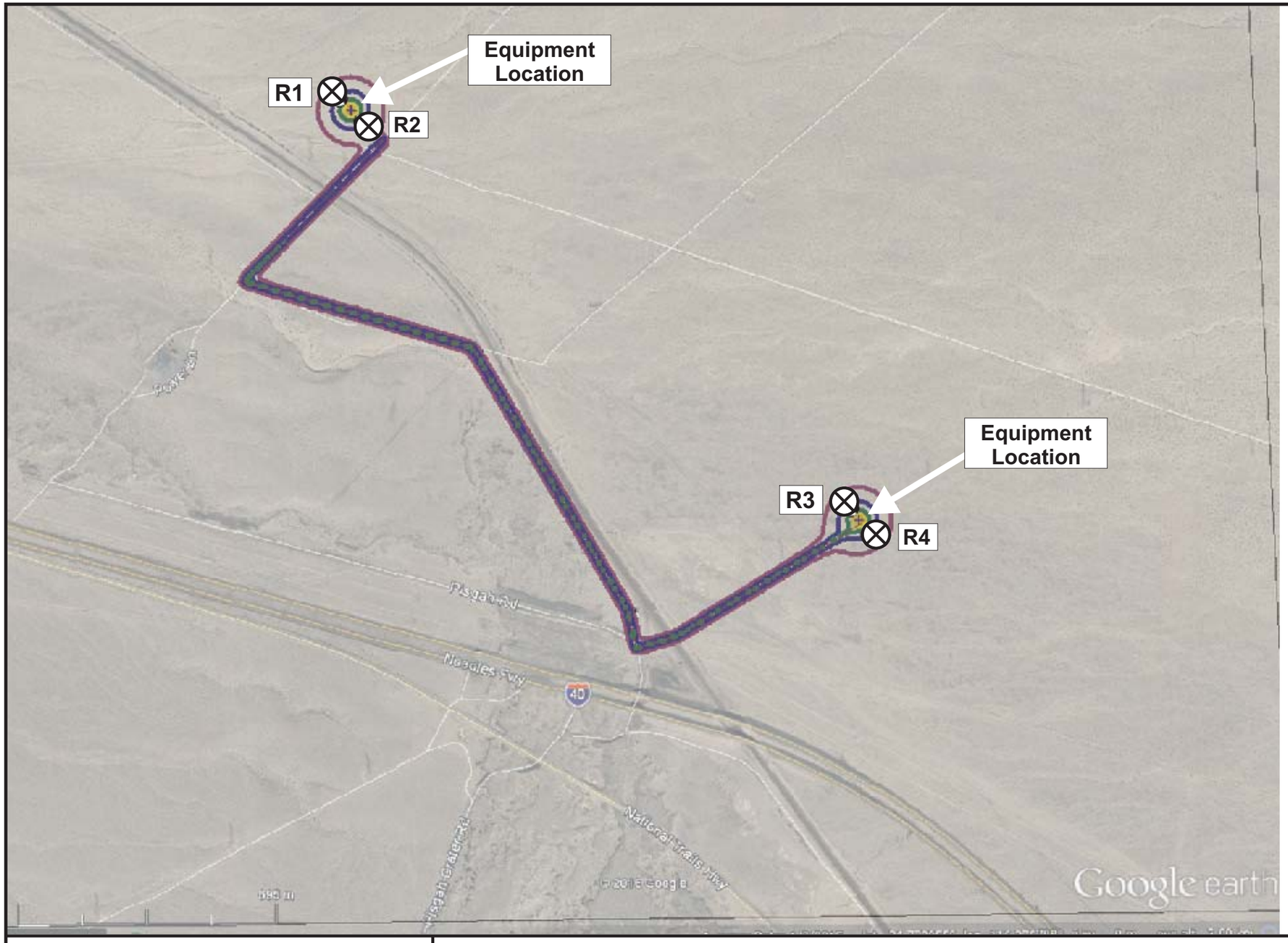
N

Calculated Equipment Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	52
R-2	52
R-3	53
R-4	52

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025
760-738-5570

Satellite Aerial Photograph Showing Operational Equipment Noise Contours and Receiver Locations for Preferred Pisgah Capacitor Stations
Job # B60102N1

Figure 8



>= 40.0
>= 45.0
>= 50.0
>= 55.0
>= 60.0
>= 65.0
>= 70.0
>= 75.0

N

Calculated Equipment Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	53
R-2	51
R-3	52
R-4	52

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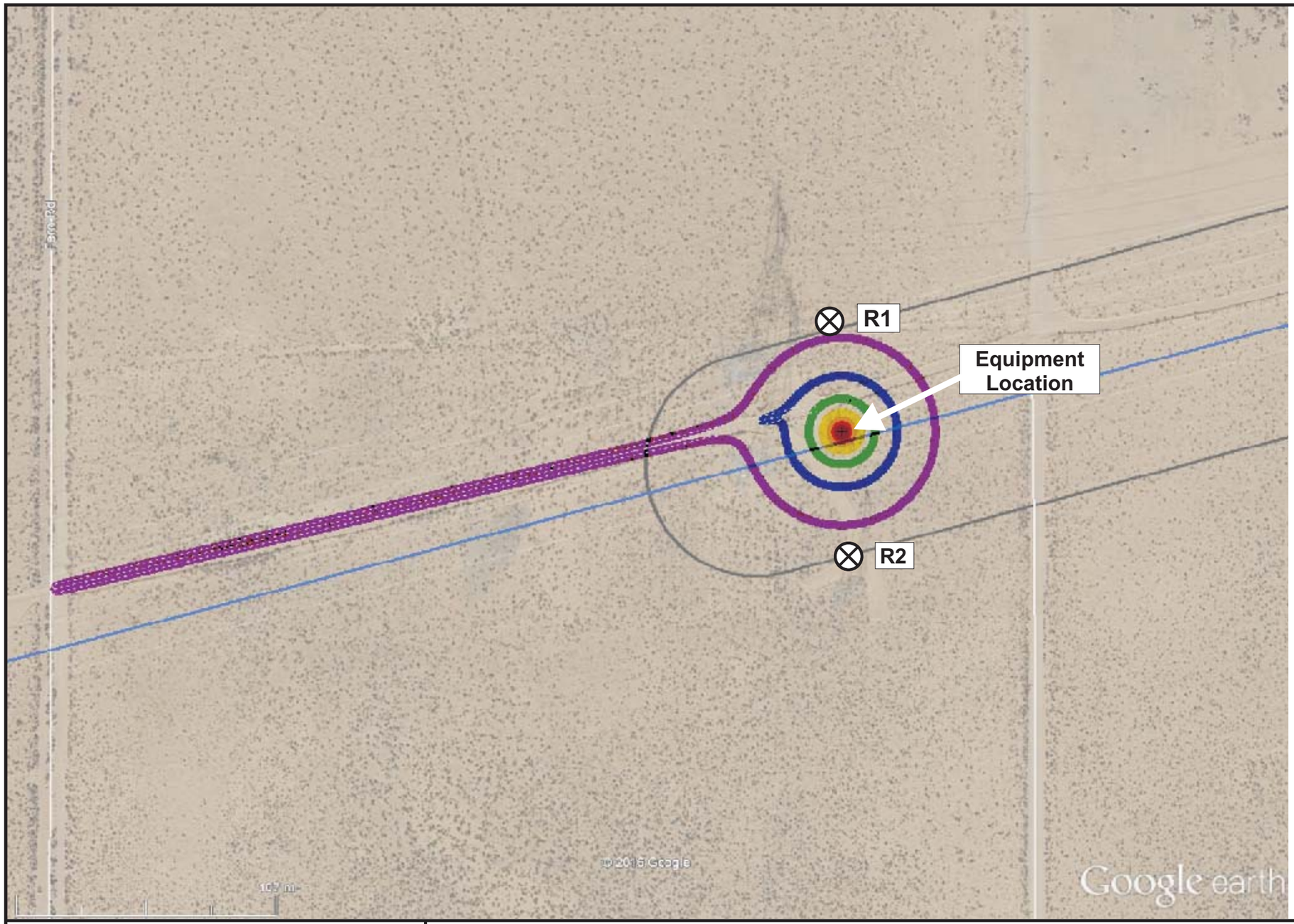
Escondido, California 92025
760-738-5570

Satellite Aerial Photograph Showing Operational Equipment Noise Contours and Receiver Locations for Alternative Pisgah Capacitor Stations
Job # B60102N1

Figure 9

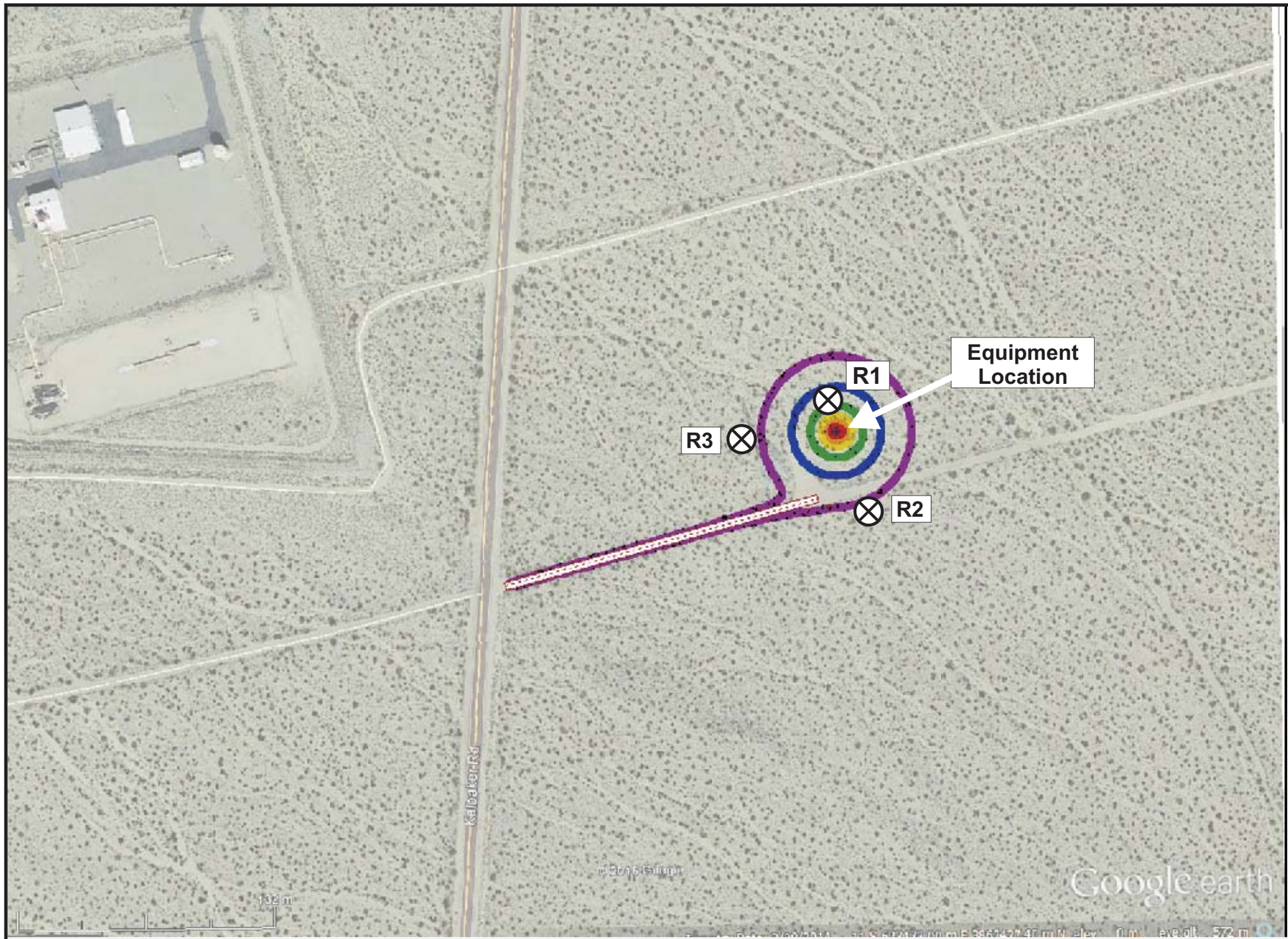


Calculated Equipment Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	43
R-2	42

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025
760-738-5570

Satellite Aerial Photograph Showing Operational Equipment Noise Contours and Receiver Locations for Barstow Fiber Optic Repeater Site
Job # B60102N1

Figure 10



>= 40.0
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>= 70.0
>= 75.0

N

Calculated Equipment Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	53
R-2	44
R-3	43

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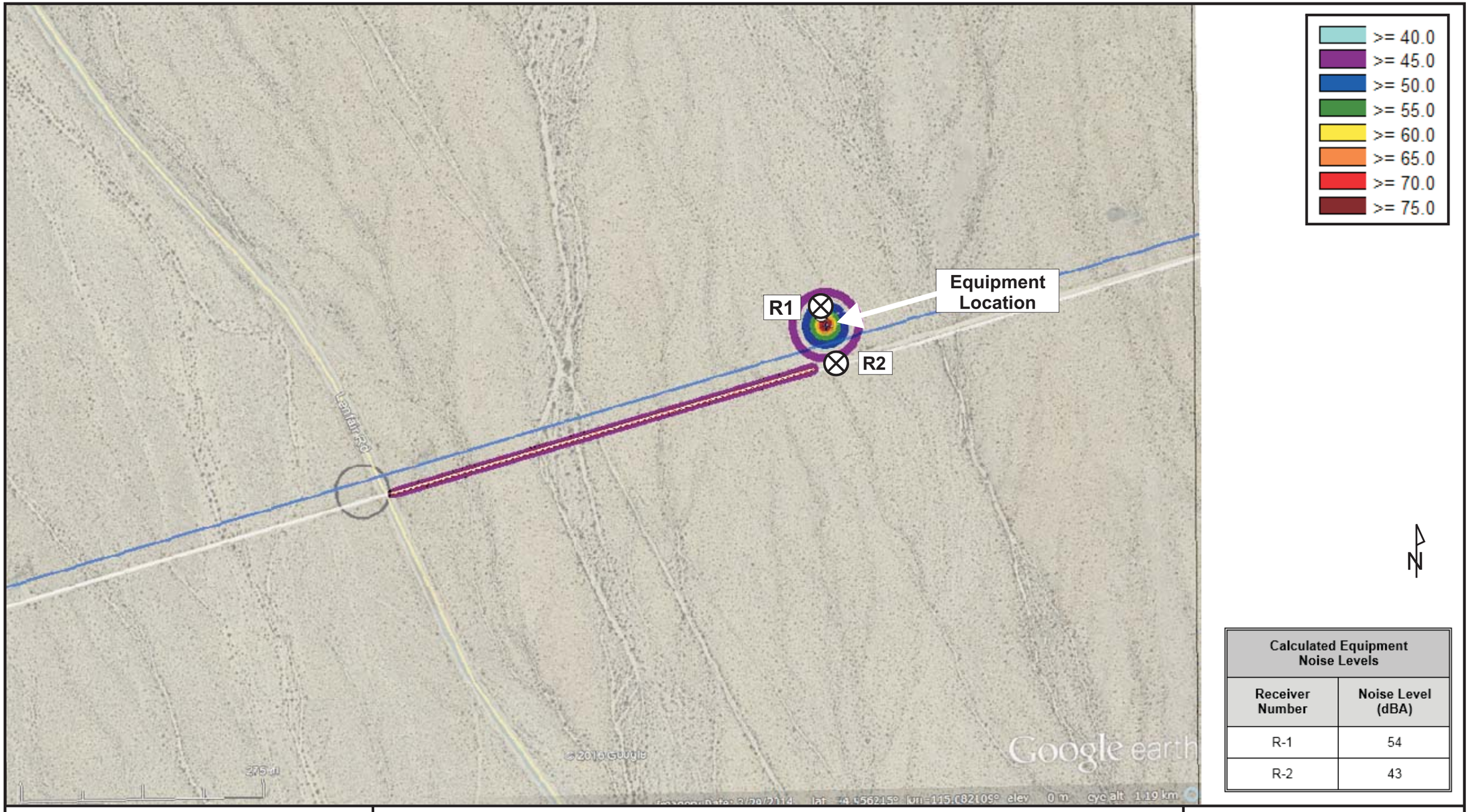
Escondido, California 92025
760-738-5570

Satellite Aerial Photograph Showing Operational Equipment Noise Contours and Receiver Locations for Kelbaker Fiber Optic Repeater Site
Job # B60102N1

Figure 11



Calculated Equipment Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	54
R-2	43

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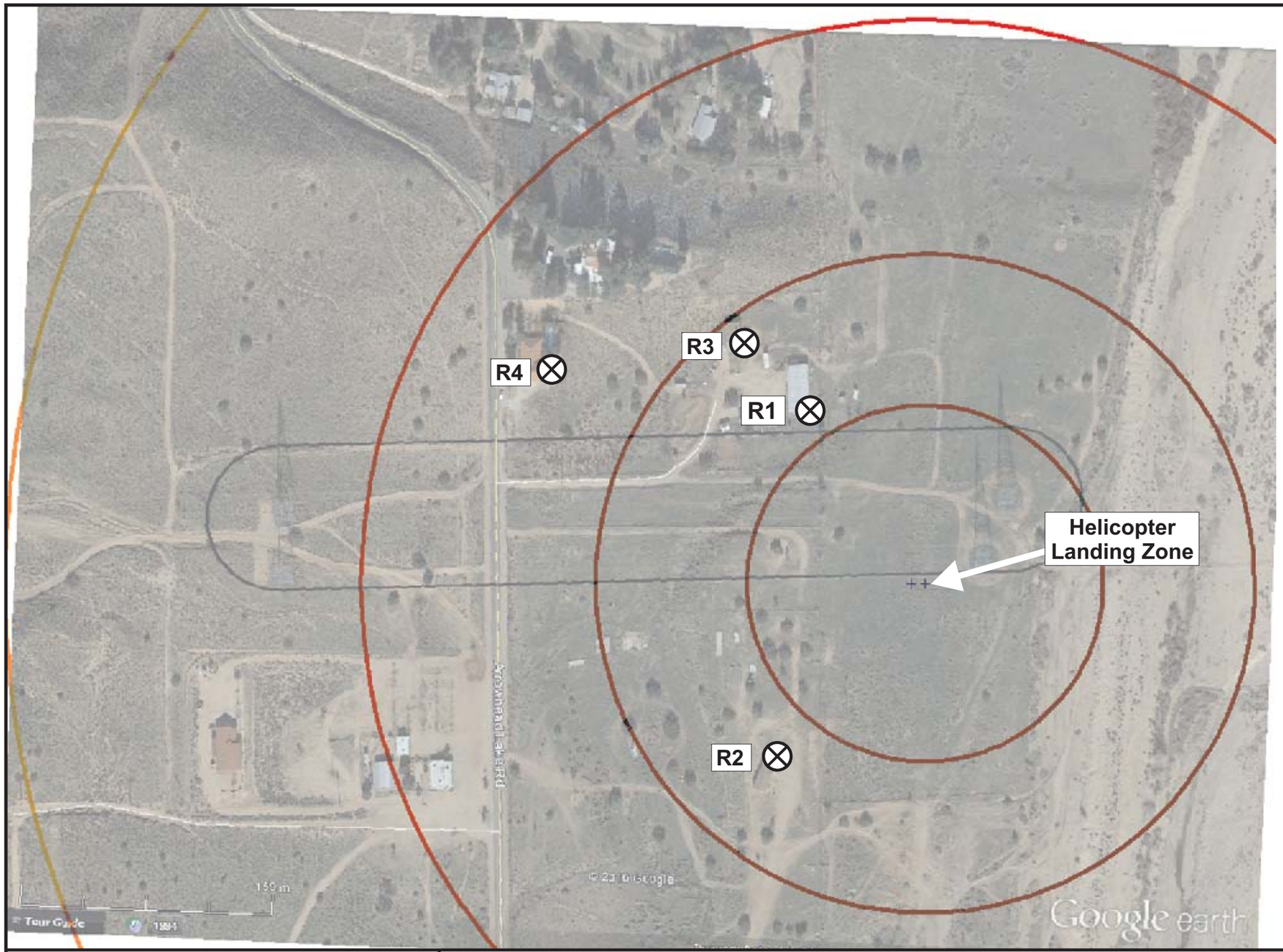
760-738-5570

Satellite Aerial Photograph Showing Equipment Noise Contours and Receiver Locations for Lanfair Fiber Optic Repeater Site
Job # B60102N1

Figure 12



N

Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	79
R-2	76
R-3	73
R-4	74

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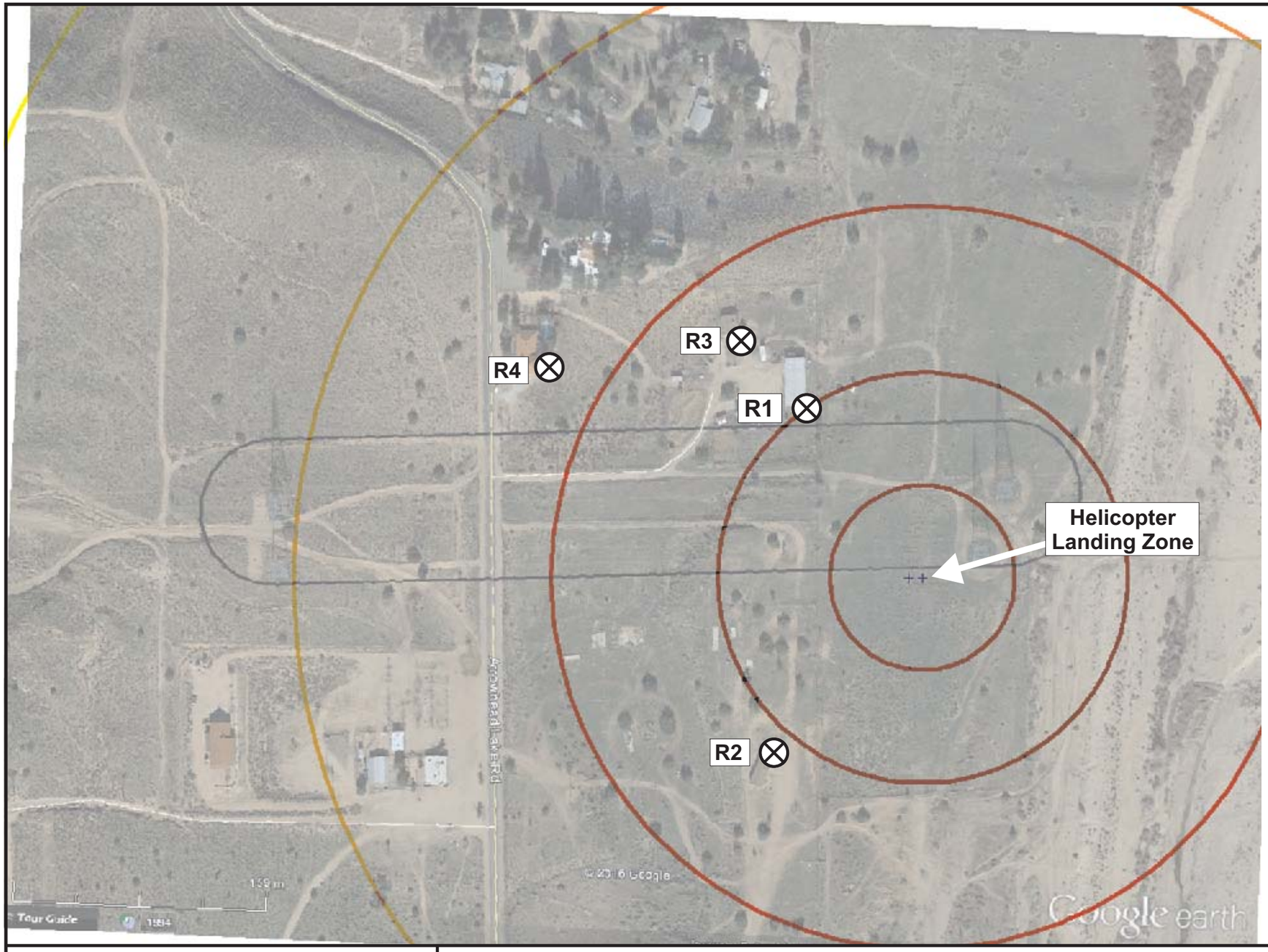
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Helicopter Landing Zone at Towers M7-T3 and M7-T4 with 50% Helicopter Duty Cycle
Job # B60102N1

Figure 13



Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	75
R-2	72
R-3	69
R-4	74

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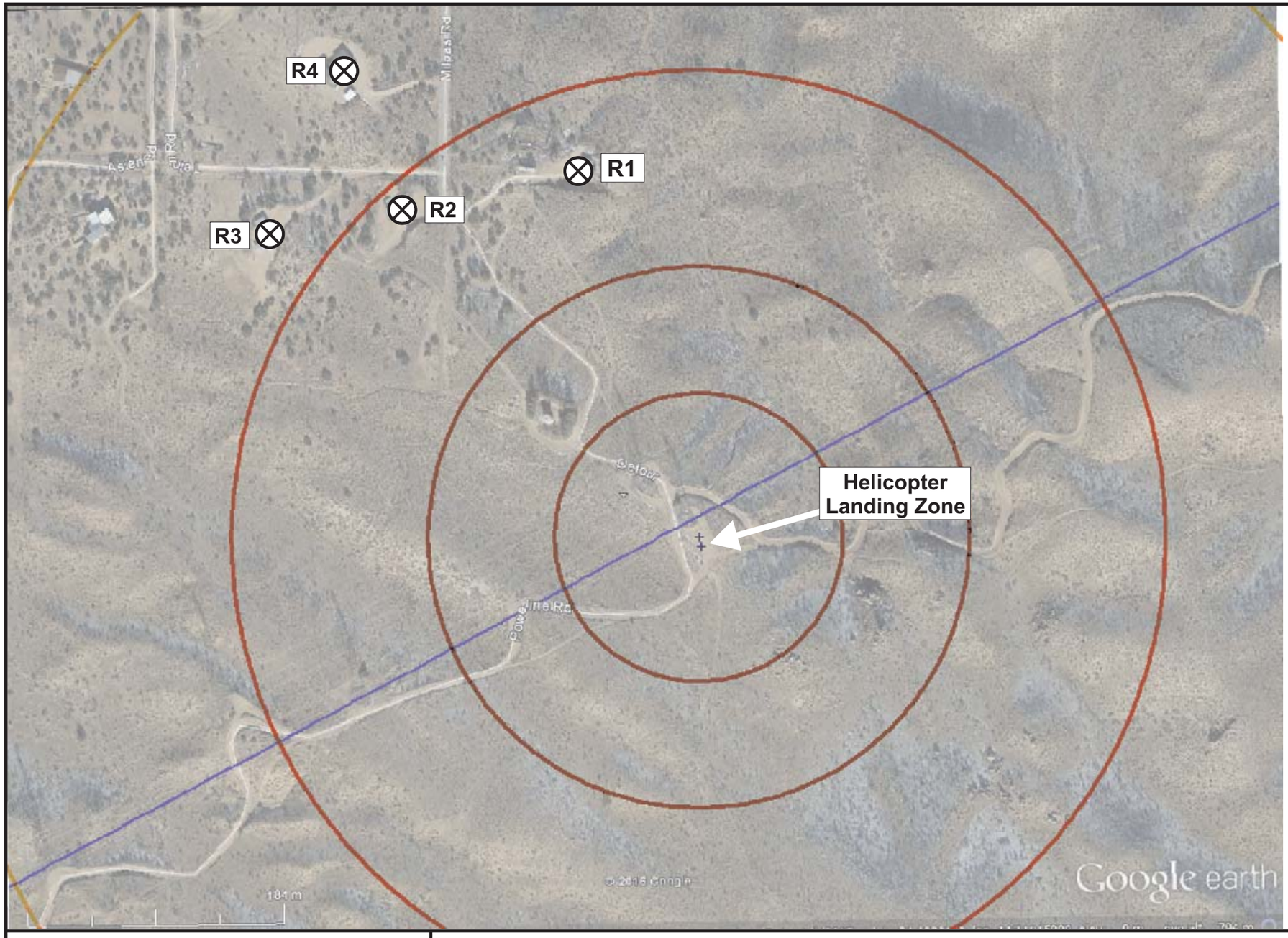
Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Helicopter Landing Zone at Towers M7-T3 and M7-T4 with 20% Helicopter Duty Cycle
Job # B60102N1

Figure 14



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>= 65.0
>= 70.0
>= 75.0

N

Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	72
R-2	71
R-3	69
R-4	68

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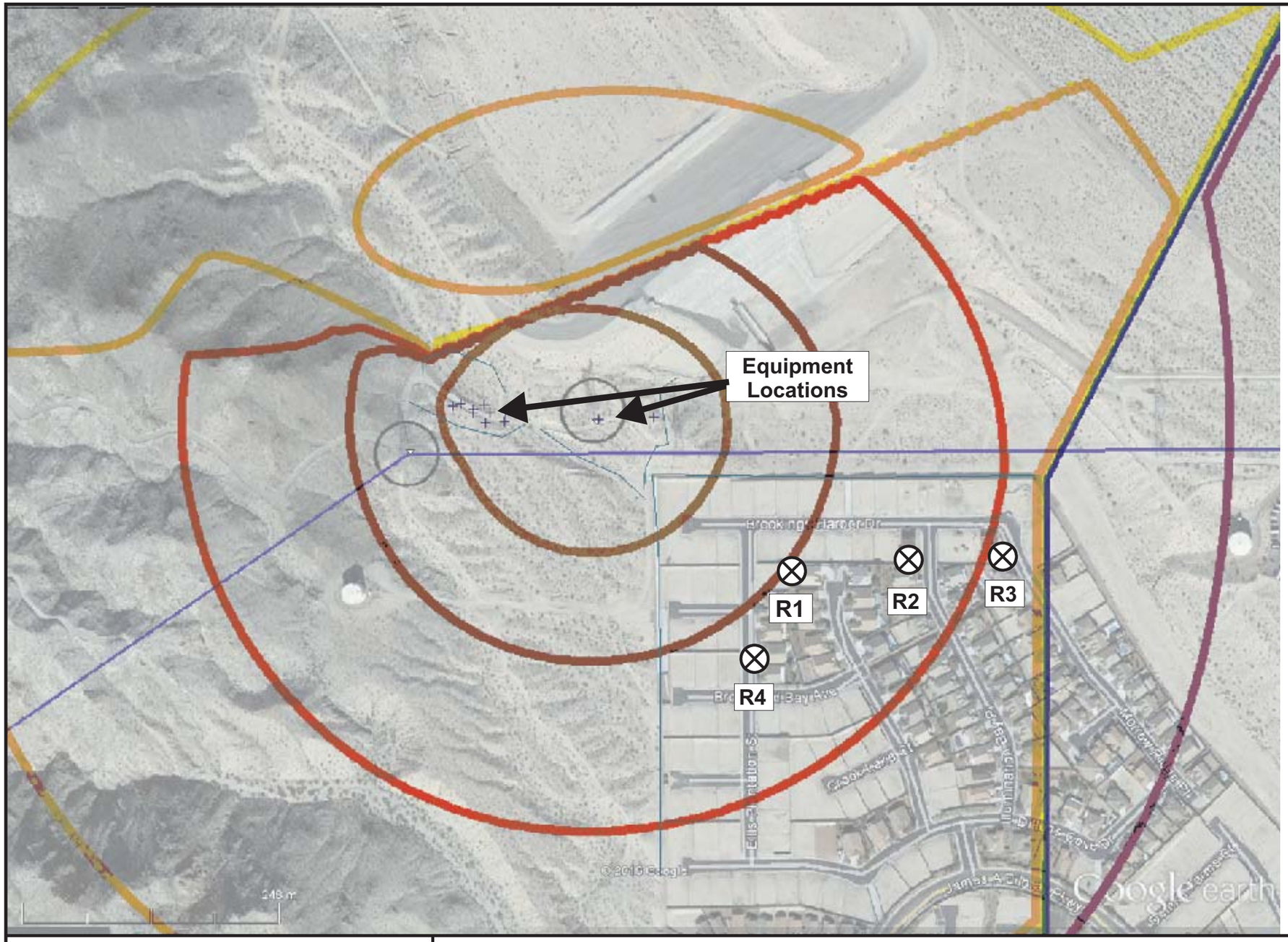
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Helicopter Landing Zone at Tower M16-T4 with 50% Helicopter Duty Cycle
Job # B60102N1

Figure 15



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>= 50.0
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>= 65.0
>= 70.0
>= 75.0

N

Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	75
R-2	72
R-3	70
R-4	73

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210 South Juniper Street, Suite 100
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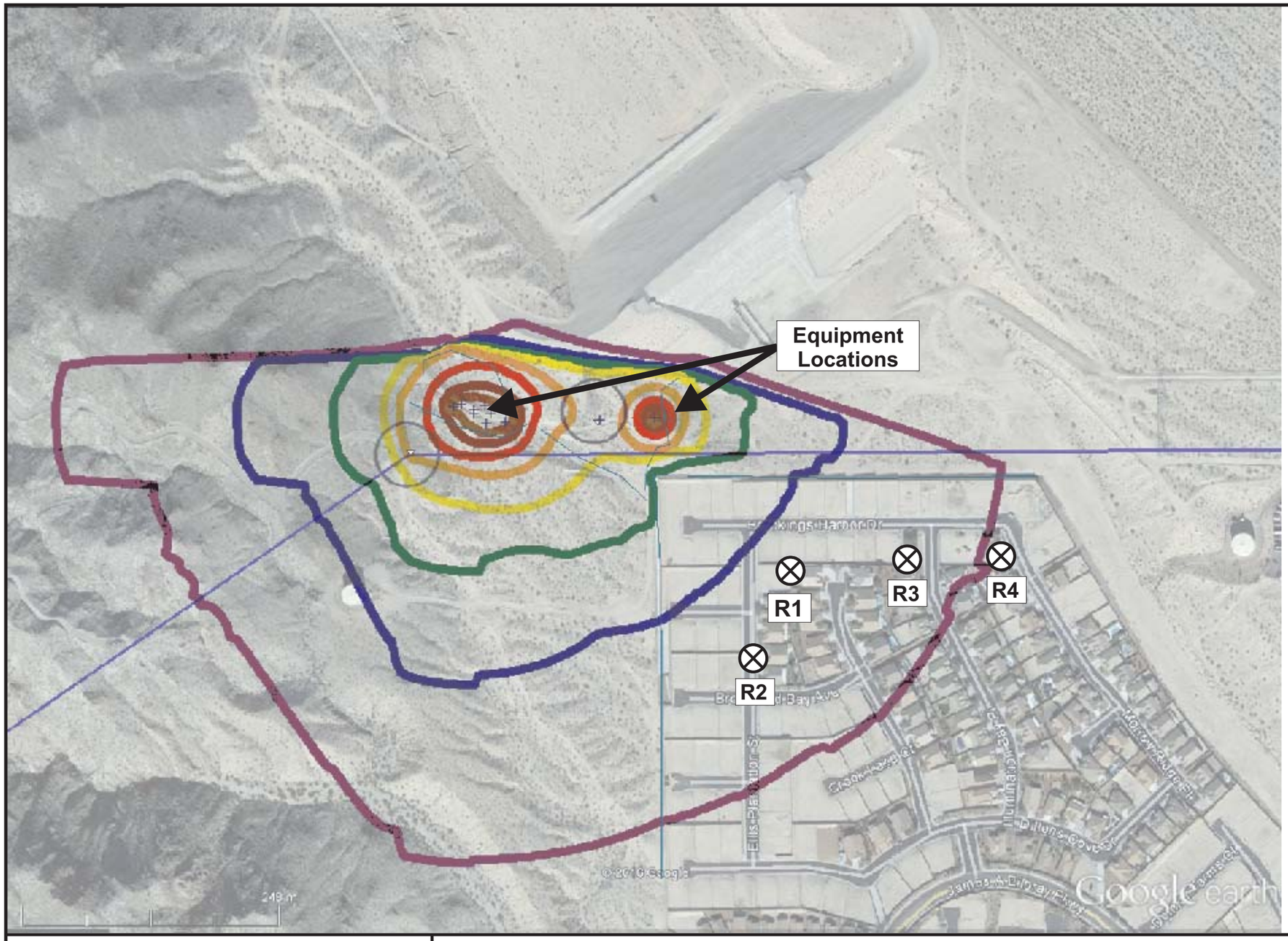
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Pulling/Tensioning Site at Towers M2-T1 and M173-T3 with 50% Helicopter Duty Cycle
Job # B60102N1

Figure 16



>= 40.0
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>= 50.0
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>= 65.0
>= 70.0
>= 75.0

N

Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	48
R-2	46
R-3	45
R-4	48

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210 South Juniper Street, Suite 100
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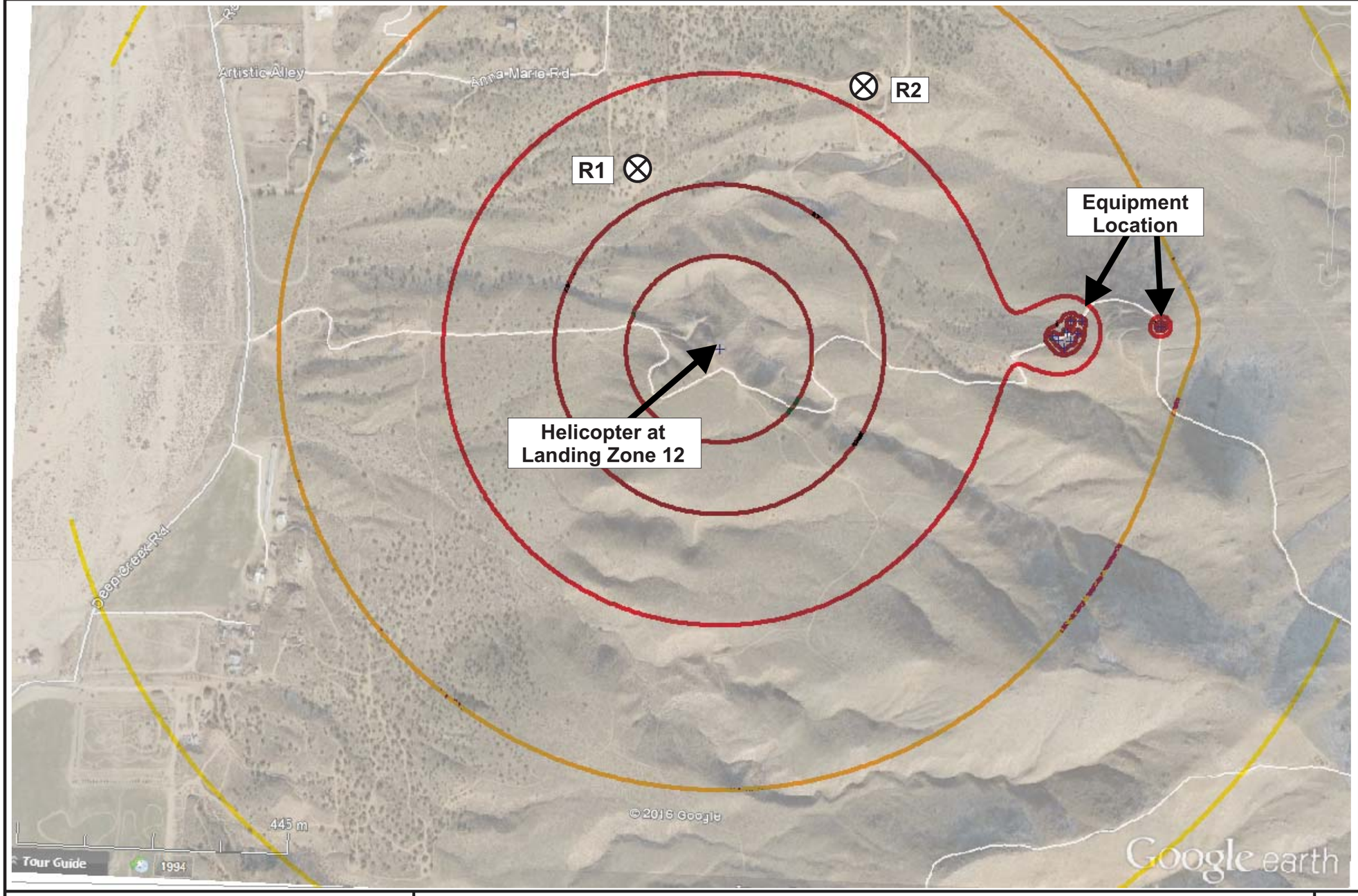
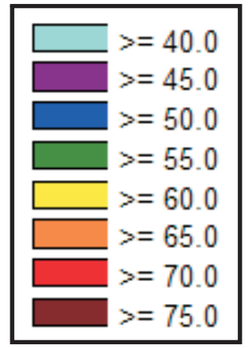
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Pulling/Tensioning Site at Towers M2-T1 and M173-T3 without Helicopter
Job # B60102N1

Figure 17





Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	73
R-2	69

Eilar Associates, Inc.
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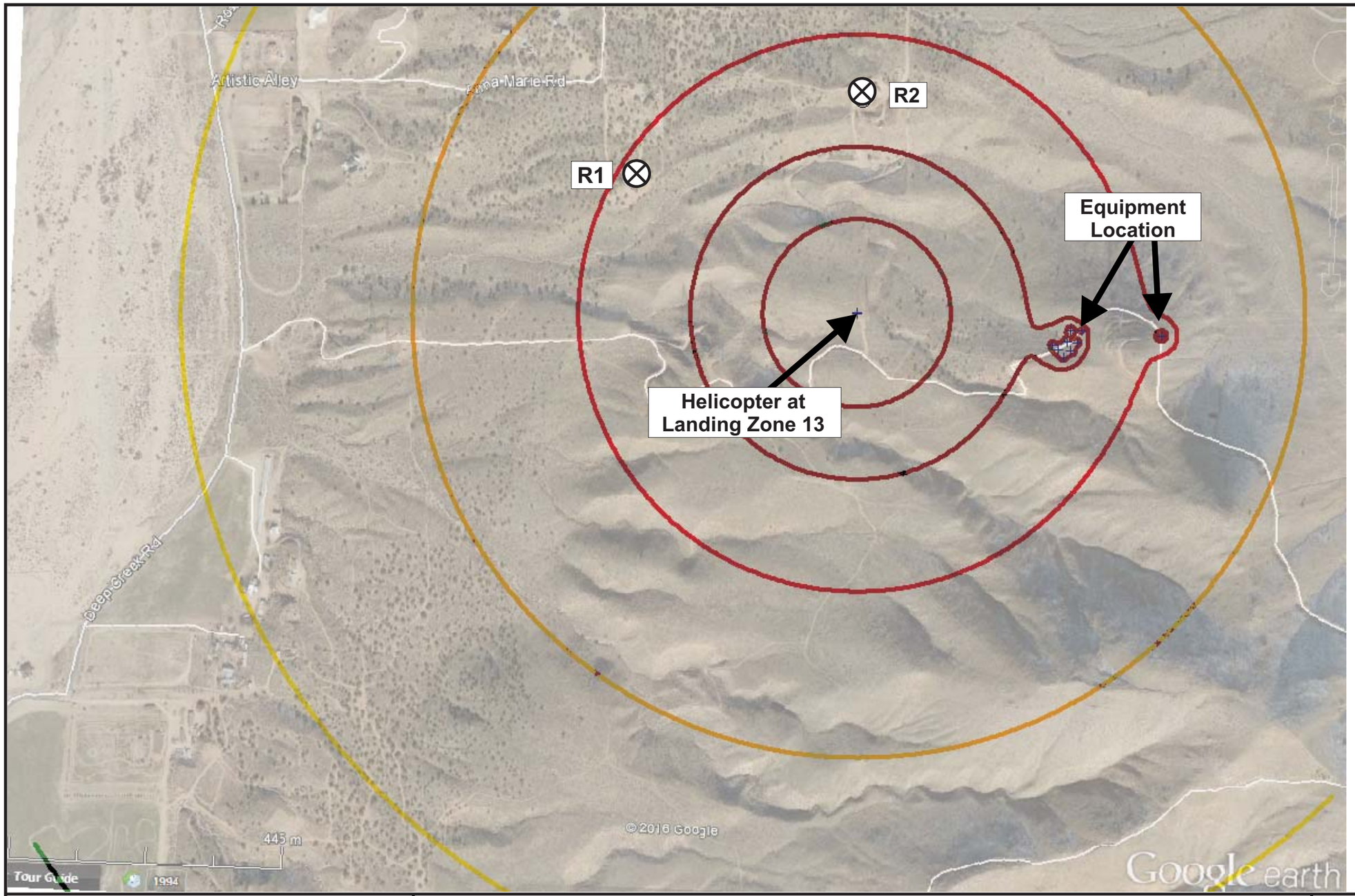
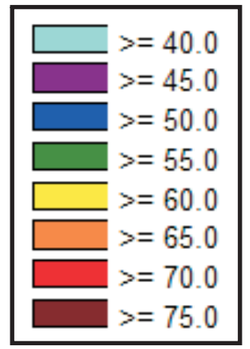
Escondido, California 92025
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Pulling/Tensioning Site at Tower M9-T1 with Helicopter at 100% Duty Cycle at Landing Zone 12
Job # B60102N1

Figure 18





Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	71
R-2	73

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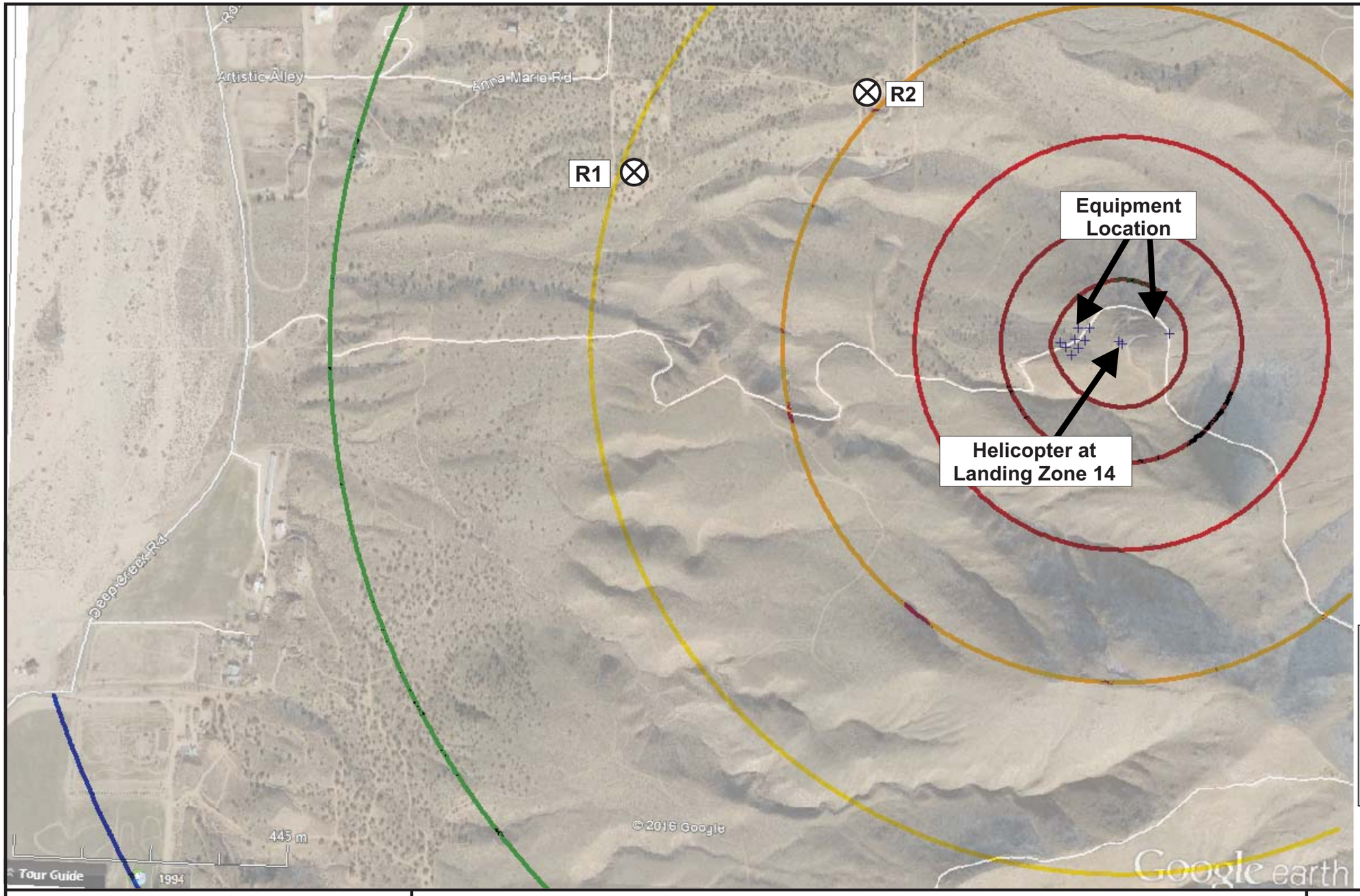
760-738-5570

Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Pulling/Tensioning Site at Tower M9-T1 with Helicopter at 100% Duty Cycle at Landing Zone 13
Job # B60102N1

Figure 19



Calculated Construction Noise Levels	
Receiver Number	Noise Level (dBA)
R-1	61
R-2	65

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Satellite Aerial Photograph Showing Construction Equipment Noise Contours and Receiver Locations for Pulling/Tensioning Site at Tower M9-T1 with Helicopter at 100% Duty Cycle at Landing Zone 14
Job # B60102N1

Figure 20

APPENDIX A

Project Plans

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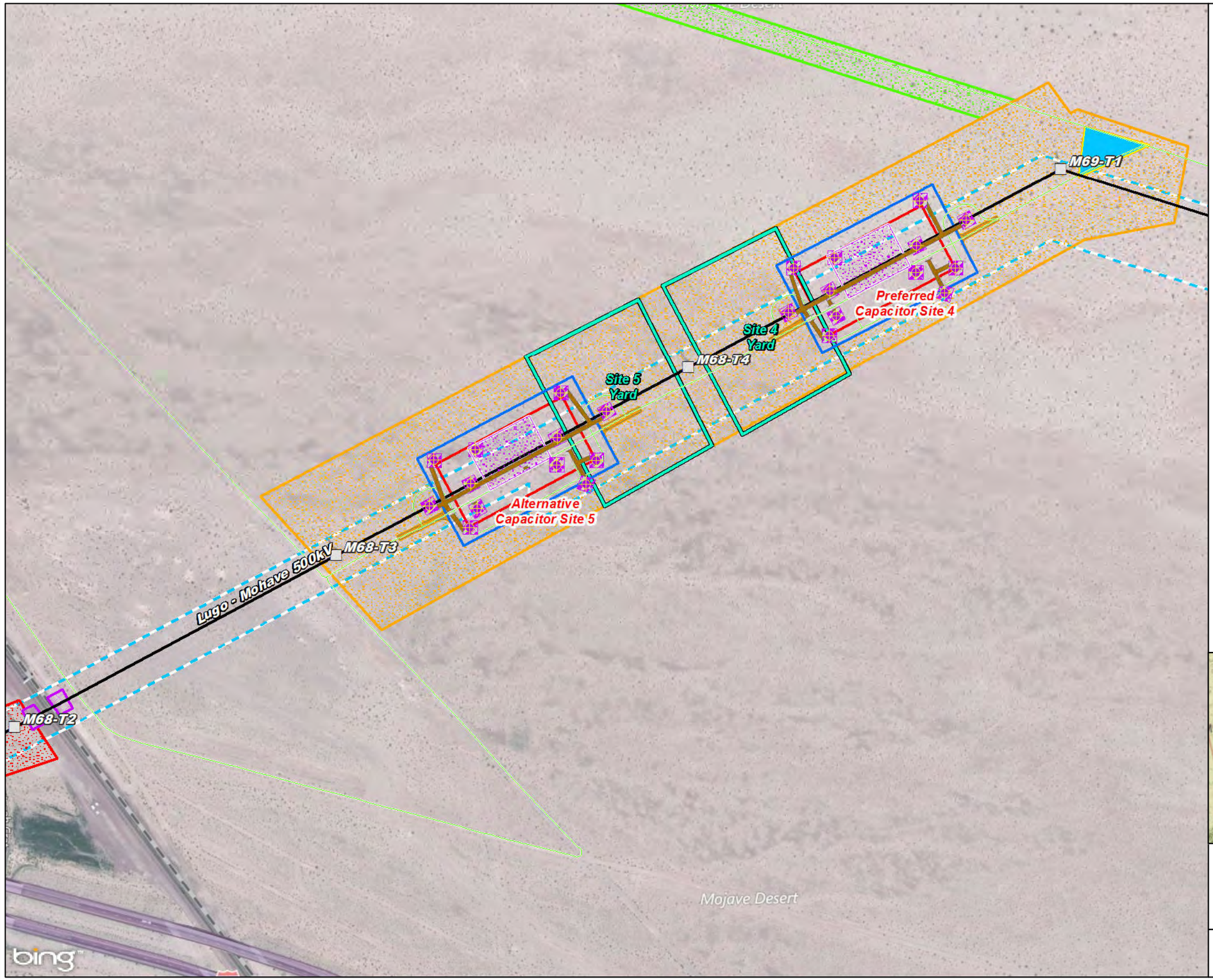


Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

- Existing Access Road C/L
- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

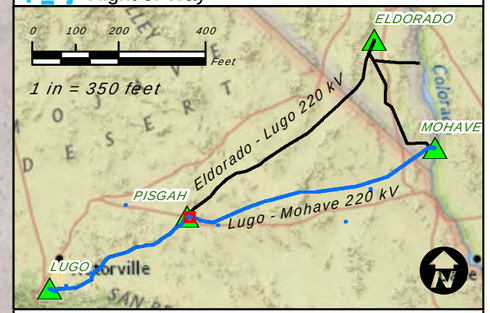
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

- Existing Access Road C/L
- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

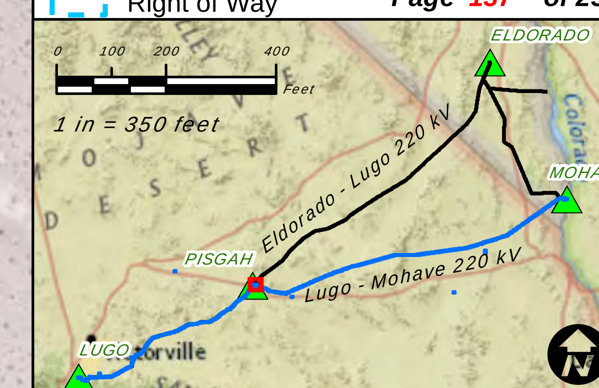
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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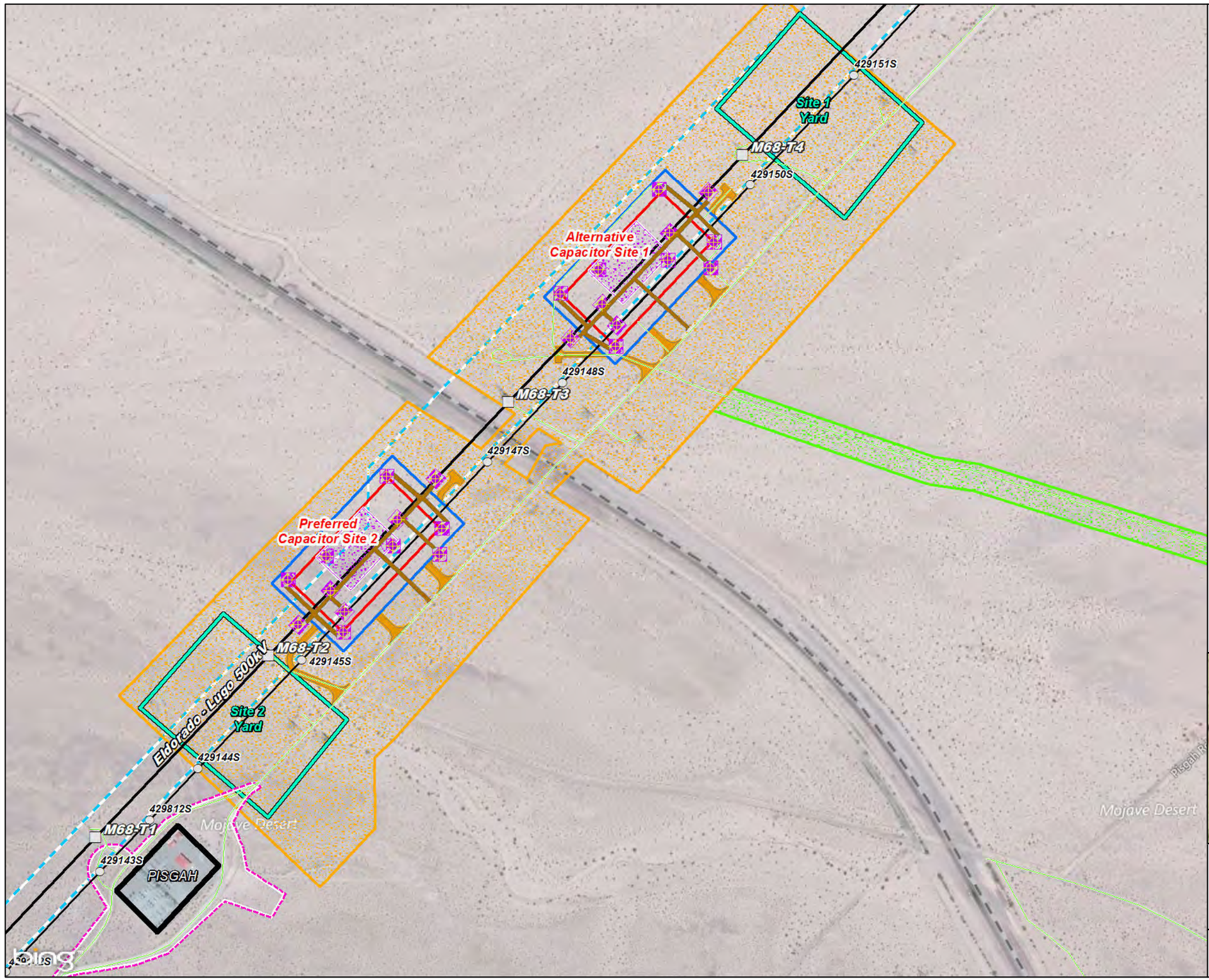

Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

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- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

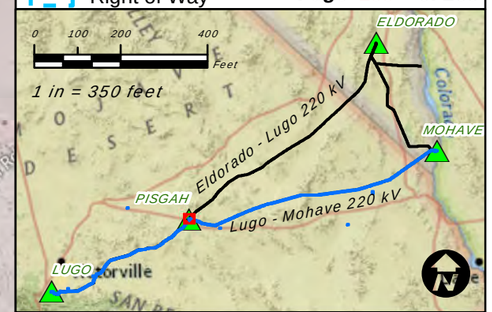
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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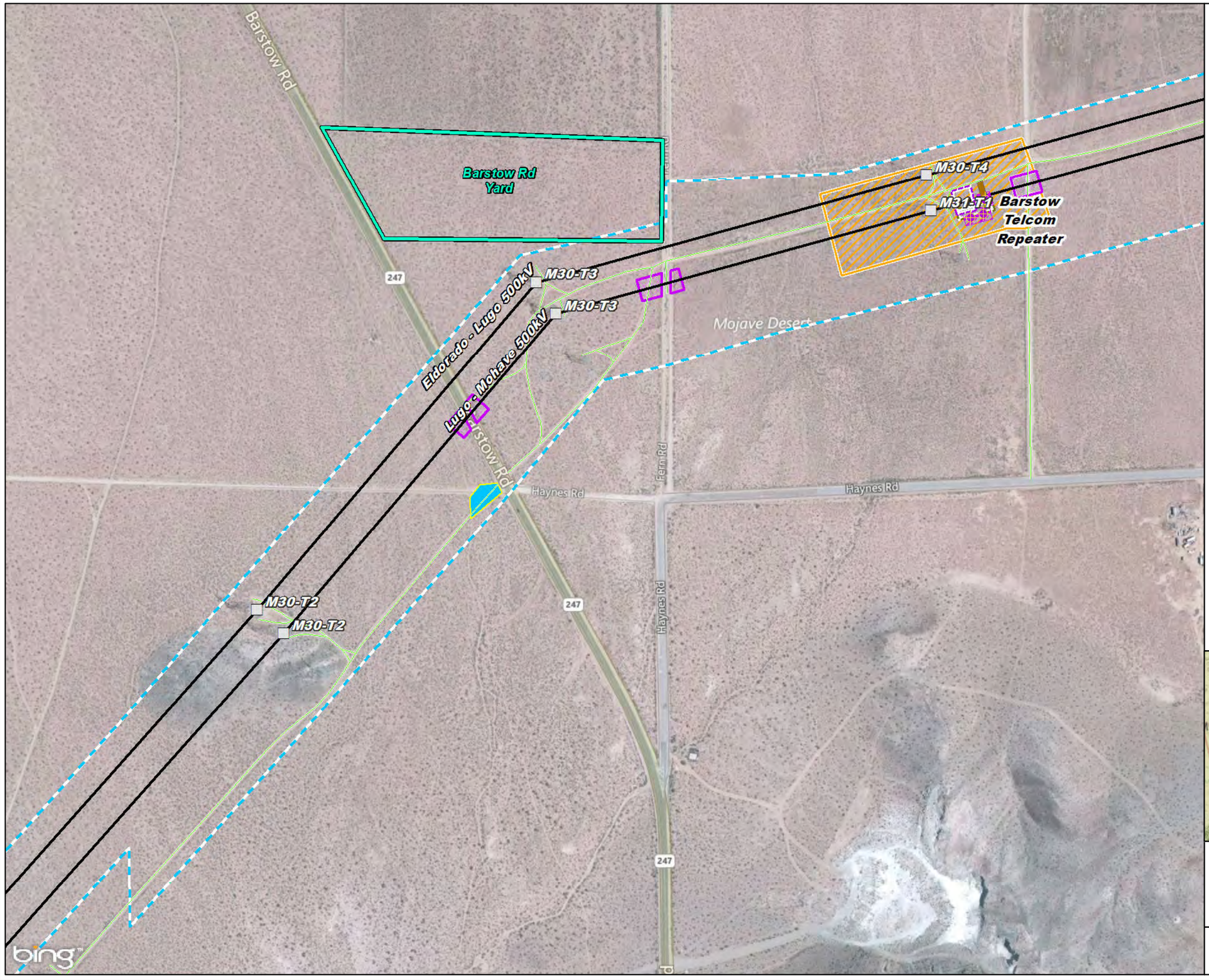

Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

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- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

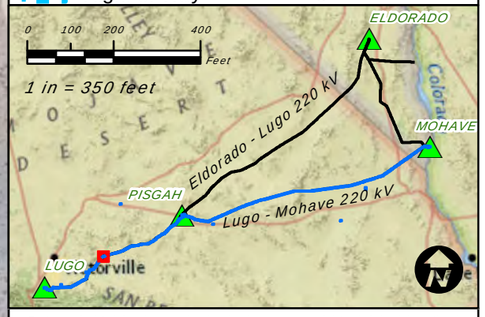
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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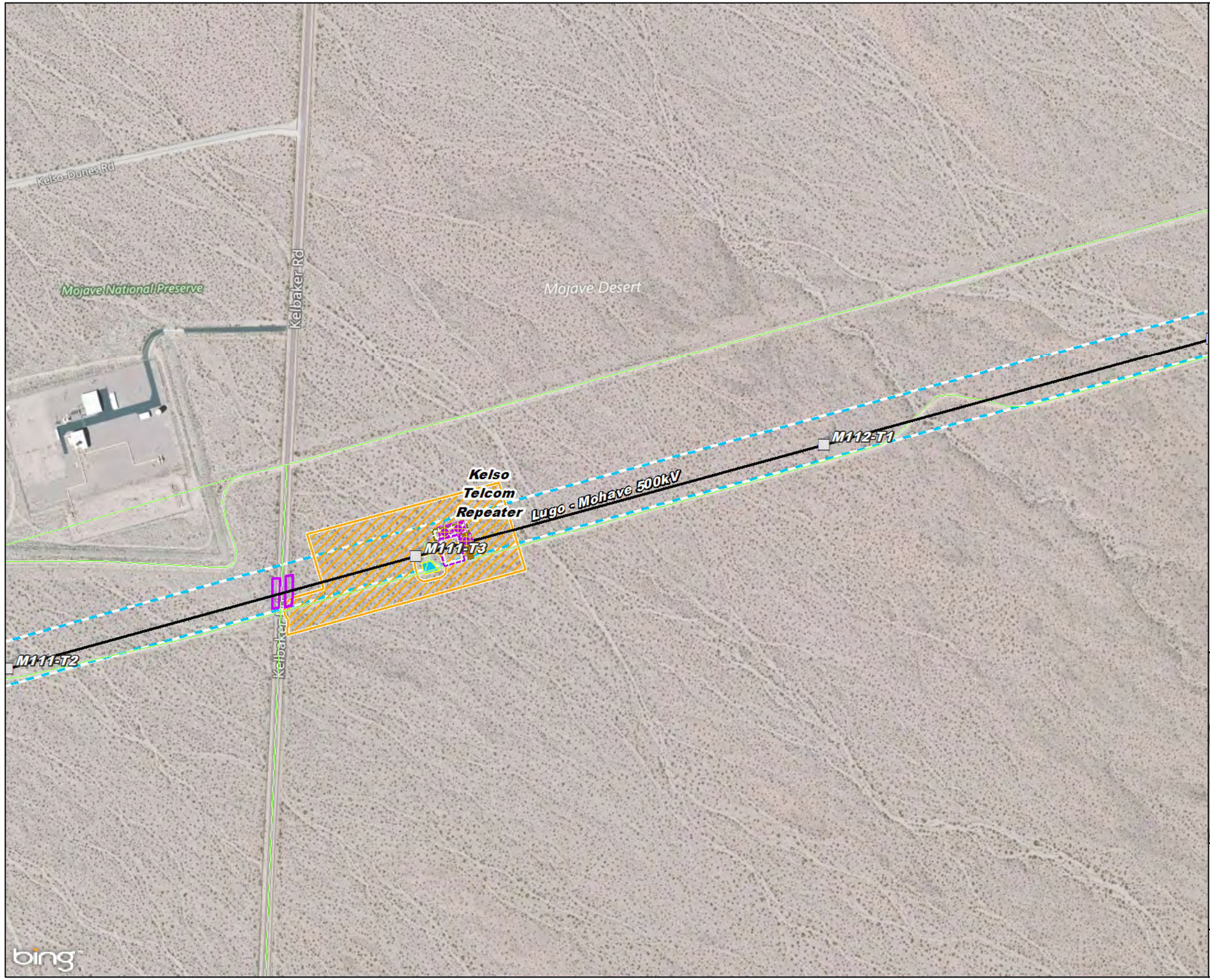


Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

- Existing Access Road C/L
- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

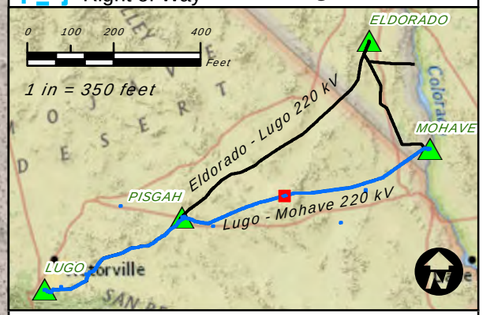
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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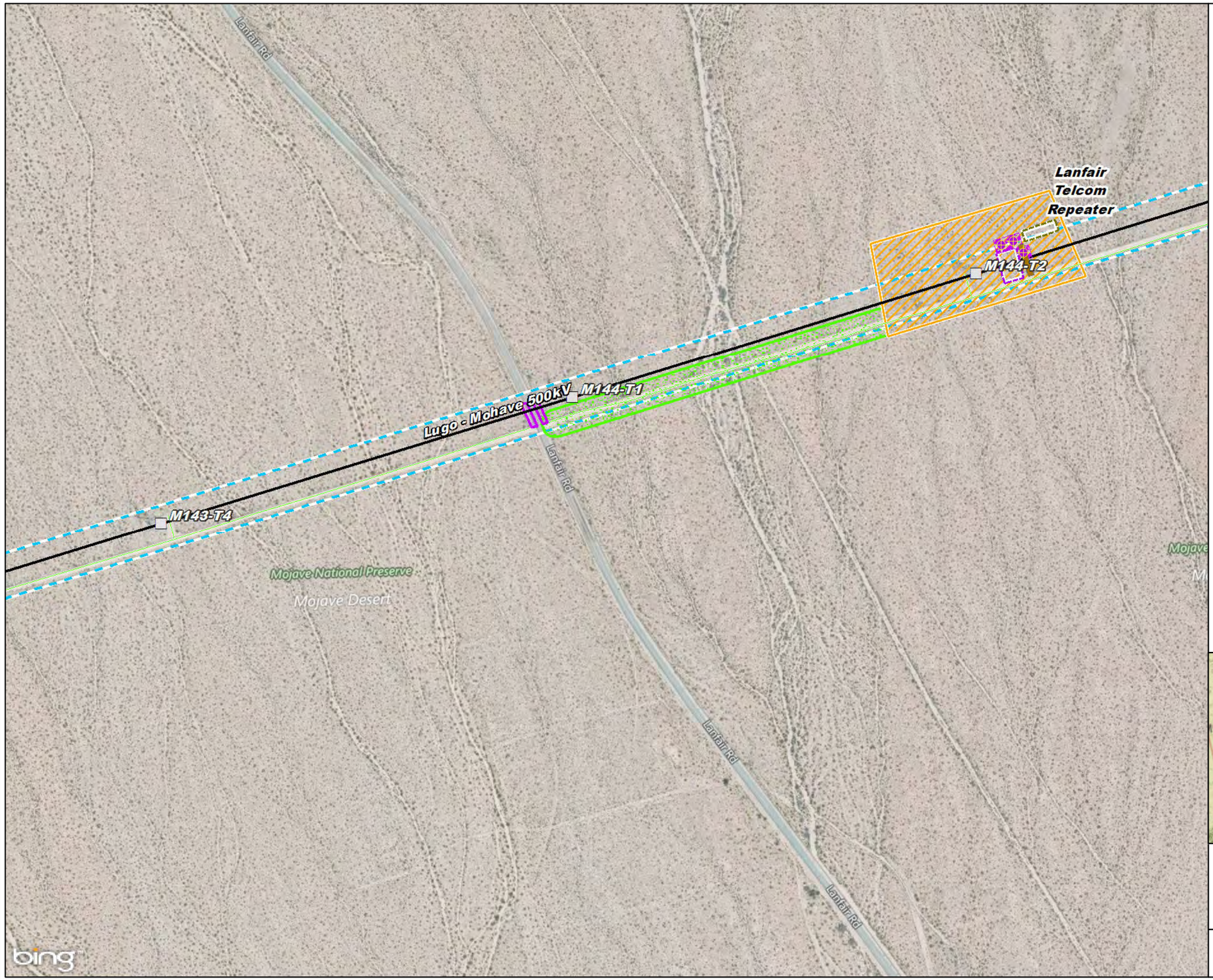

Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
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- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

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- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

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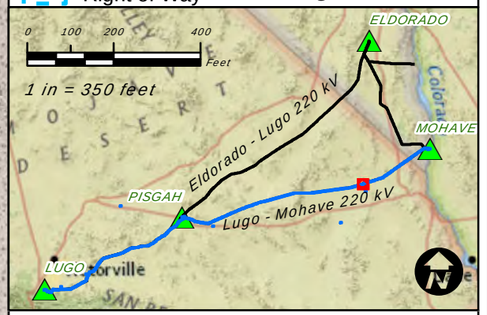
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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Eldorado Lugo Mohave Series Capacitors Mohave Sub - Lugo Sub

ENGINEERING

- Existing Transmission Structure
- Existing Transmission Line
- Existing Substations Boundary
- Proposed Capacitor Site
- Proposed Telecom Repeater Sites

CIVIL ENGINEERING

- Existing Access Road C/L
- Access Roads Grading Limit (Permanent)
- Capacitor Grading Limit (Permanent)
- Potential Land Disturbance
- Access Roads (Permanent)
- Access Roads

CONSTRUCTION

- Guard Structure Area
- Helicopter Landing Zone
- Parking Area
- Pulling/Tensioning/Splicing
- Material/Laydown Yards

POTENTIAL LAND DISTURBANCE

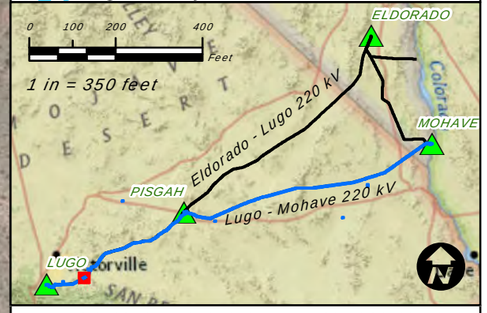
- Capacitor
- Distribution
- Telecommunication
- Transmission Infraction

GEOTECHNICAL

- Soil Boring
- Overland Travel
- Potential Land Disturbance
- Potholing
- Staging Area

MISC

- Substation Work Area
- Right of Way



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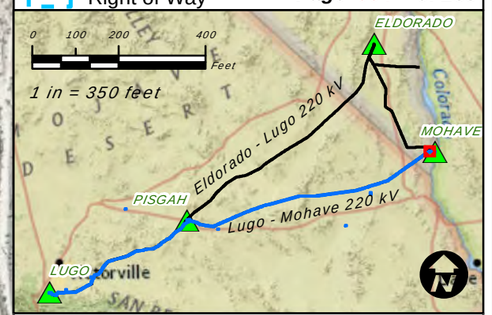

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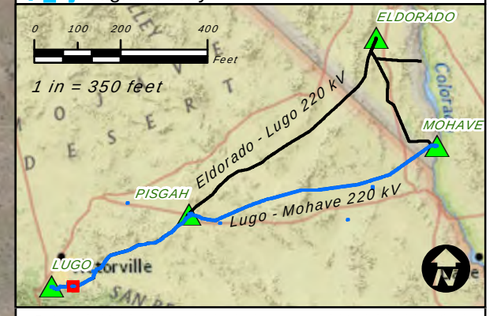

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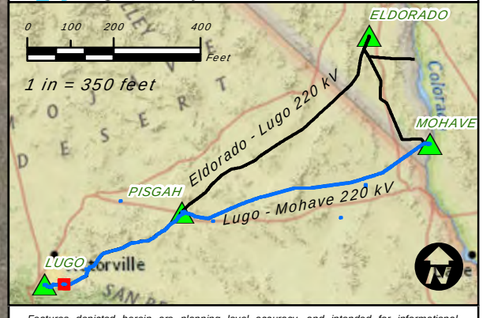

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APPENDIX B

Pertinent Sections of
Applicable Noise Regulations

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83.01.080 Noise

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) Noise measurement. Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI Section SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) Noise impacted areas. Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subsection (d) (Noise standards for stationary noise sources) and Subsection (e) (Noise standards for adjacent mobile noise sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) Noise standards for stationary noise sources.

(1) Noise standards. Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2
Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7 am-10 pm Leq	10 pm-7 am Leq
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically 1, 8 or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10 pm to 7 am). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) Noise limit categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) Noise standards for adjacent mobile noise sources. Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3
Noise Standards for Adjacent Mobile Noise Sources

Land Use		Ldn (or CNEL) dB(A)	
Categories	Uses	Interior (1)	Exterior (2)
Residential	Single and multi-family, duplex, mobile homes	45	60 (3)
Commercial	Hotel, motel, transient housing	45	60 (3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7 p.m. to 10 a.m. and 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m.

(e) Increases in allowable noise levels. If the measured ambient level exceeds any of the first four noise limit categories in Subsection (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subsection (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) Reductions in allowable noise levels. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by 5 dB(A).

(g) Exempt noise. The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) Noise standards for other structures. All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4
Noise Standards for Other Structures

Typical Uses	12-Hour Equivalent Sound Level (Interior) in dBA Ldn
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

Adopted Ordinance 4011 (2007)

83.01.090 Vibration

(a) Vibration standard. No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot line.

(b) Vibration measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) Exempt vibrations. The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

Adopted Ordinance 4011 (2007)

83.01.100 Waste Disposal

(a) Liquid waste disposal and runoff control. No liquids of any kind shall be discharged into a public or private sewage or drainage system, watercourse, body of water, or into the ground, except in compliance with applicable regulations of the County Code, Title 23 (Waters) of the California Code of Regulations, the California Water Code, and related Federal regulations.

(b) Hazardous waste. Refer to Chapter 84.11 (Hazardous Waste Facilities) for regulations relative to hazardous waste facilities.

(c) Solid waste disposal. Refer to Chapter 84.24 (Solid Waste/Recyclable Materials Storage) for regulations relative to solid waste disposal.

Adopted Ordinance 4011 (2007)

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30.68 Site Environmental Standards

30.68.010 Purpose. The purpose of this Chapter is to protect adjacent uses and the community against objectionable noise, light, smoke, particulate matter, odors, and hazardous materials generated on property by uses conducted on the property.

30.68.020 Noise.

a. Excessive noise shall be muffled to mitigate objectionable intermittence, beat frequency, shrillness or volume.

b. The maximum permissible sound pressure level of any continuous, regular, or frequency source of sound produced by any activity shall be established by time period and type of zoning district per Table 30.68-1.

c. Public address systems of any kind shall only be permitted subject to special use permit approval unless in conjunction with live entertainment or a temporary outdoor commercial event which is otherwise approved.

d. Sound levels shall be measured with a sound level meter and associated octave band filter, manufactured according to standards prescribed by the American National Standards Institute, ANSI S1.2-1962 "American Standard Meter for the Physical Measurement of Sound" and the revisions thereof, including ANSI S1.1-1976, ANSI S1.6-1984, ANSI S1.4-1983- Type 1 Precision, ANSI S1.11-1986 and ANSI S1.13 Field Method. Measurements shall be made using the flat network of the sound level meter.

e. Impulsive type noises shall be subject to the standards described in Table 30.68-2, provided they are capable of being accurately measured with the equipment described above.

f. For the purpose of this Chapter, noises capable of being measured shall be those which cause rapid fluctuations of the sound level meter needle with a variation of no more than plus or minus 2 decibels. Noises incapable of being measured, such as irregular and intermittent sound emissions, shall be controlled so as not to become a nuisance to adjacent uses.

g. Sound pressure levels shall be measured at all property lines at a height of at least 4 feet above the ground surface.

1. Where the emitting and receiving premises are in different zoning districts, the limits governing the more restrictive district shall apply to any regulated noise entering that district.

2. The levels specified may be exceeded by 10 decibels for a single period not to exceed 15 minutes in any one day.

h. Requirements of this Section do not apply to:

1. Construction and/or demolition activities when conducted during daytime hours.

2. Sound generating equipment or apparatus used for public safety or to warn the public of an emergency.

3. Noise from use-related loading/unloading operations that affect residential areas when conducted during daytime hours.

4. Lawn maintenance and home repair only if conducted during daytime hours as a normal function of any authorized use, and the equipment is maintained in proper working condition.

5. Aircraft Noise.

6. Properties located within the Gaming Enterprise District located between Sahara Avenue and St. Rose Parkway and Koval Lane or its alignment and Cameron Street or its alignment.
(Ord. 4089 § 1 (part), 3/2013; Ord. 2907 § 11 (part), 7/2003)

Table 30.68-1 Noise - Maximum Permitted Sound Levels (Decibels)

OCTAVE BAND CENTER FREQUENCY (HERTZ)	WITHIN RESIDENTIAL DISTRICTS		WITHIN BUSINESS AND INDUSTRIAL DISTRICTS	
	DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME
31.5	72	65	76	65
63	65	58	69	62
125	58	50	62	54
250	53	44	58	49
500	50	40	55	45
1000	47	37	52	42
2000	43	33	49	38
4000	40	30	46	35
8000	37	27	43	32

Table 30.68-2 Impulsive Noise - Maximum Permitted Sound Levels (Decibels)

WITHIN RESIDENTIAL DISTRICTS		WITHIN BUSINESS AND INDUSTRIAL DISTRICTS	
DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME
56	46	65	61

Source: American National Standards Institute, Inc.

30.68.030 Lighting. All on-site lighting of buildings, lawns, recreation areas, and parking areas shall be designed to prevent light from shining directly onto residential uses. All light sources shall be shielded and directed downward at all times to prevent adverse impacts to adjacent residential uses or zoning districts. See Section 30.56.135 for "Lighting Standards". (Ord. 3757 § 10, 4/2009; Ord. 3688 § 13, 10/2008; Ord. 2907 § 11 (part), 7/2003)

30.68.040 Vibration. Vibration shall not be discernable to the human senses at any property line at any time. This requirement shall not apply to properties located within the Gaming Enterprise District located between Sahara Avenue and St. Rose Parkway and Koval Lane or its alignment and Cameron Street or its alignment. (Ord. 4089 § 1 (part), 3/2013; Ord. 2907 § 11 (part), 7/2003)

30.68.050 Odors. Odor is regulated by Clark County Air Quality Regulation Section 43 in accordance with Title 9, Chapter 9.08. (Ord 4008 § 33, 3/2012; Ord. 3085 § 57, 6/2004; Ord. 2907 § 11 (part), 7/2003)

30.68.060 Smoke and Particulate Matter. Smoke and particulate matter are regulated by the Clark County Air Quality Regulations in accordance with Title 9, Chapter 9.08. (Ord 4008 § 34, 3/2012; Ord. 3085 § 58, 6/2004; Ord. 2907 § 11 (part), 7/2003)

30.68.070 Hazardous Material. Hazardous materials, including chemicals and explosives, shall be regulated by the Clark County Fire Code, adopted Building Codes, and by the Nevada Revised Statutes and/or the Nevada Administrative Code. A special use permit is required for hazardous materials storage (See 30.08 and Tables 30.16-4 & 30.44-1). (Ord. 3085 § 59, 6/2004; Ord. 2907 § 11 (part), 7/2003)

30.68.080 Adjustments to Site Environmental Standards. Proposals to utilize standards different from those provided elsewhere in this chapter may be considered in light of the unique characteristics of an individual site, including those created by the shape and location of property, design of existing or proposed structures, and the operation of proposed uses at the site. Adjustments to site environmental standards include those related to noise and lighting. The determination of the acceptability of such adjustments shall be based upon consideration of the following:

1. The ability of the proposed adjustments to result in the same or improved site environmental functions required by the standards of this Chapter.

2. The ability of the proposed adjustments to provide the same or enhanced visual character to the site that would result from the application of the required site environmental standards for which alternatives are being offered.

3. The ability of the proposed adjustments to result in site environmental standards that maintain or increase compatibility with adjacent sites as anticipated through the application of the required site environmental standards for which alternatives are being offered. (Ord. 2907 § 11 (part), 7/2003)

16.20.125 - Noise.

A. Noise Measurement. Noise will be measured with a sound level meter, which meets the standards of the American National Standards Institute (ANSI Section S1.4-1979, Type 1 or Type 2). Noise levels shall be measured using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micro-newtons per meter squared). The unit of measure shall be designated as dB(A). The building official shall be the noise control officer.

B. Noise Standards.

1. The following table describes the noise standard for emanations from any source, as it affects adjacent properties:

NOISE STANDARDS

Affected Land Use (Receiving Noise)	Maximum Noise Level	Time Period
A-1, A-2, R-1, R-3 and RR Zone Districts	55 dB(A)	10:00 p.m. - 7:00 a.m.
A-1, A-2, R-1, R-3 and RR Zone Districts	60 dB(A)*	7:00 a.m. - 10:00 p.m.
C-1, C-2, C-3, C-4, C-R, AP, and P-I Zone Districts	65 dB(A)*	Anytime
I-1 and I-2 Zone Districts	70 dB(A)*	Anytime

* Due to wind noise, the maximum permissible noise level may be adjusted so that it is no greater than five dB(A) above the ambient noise level.

2. No person shall operate or cause to be operated any source of sound at any location or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed:

a. The noise standard for that receiving land use (as specified in subsection (B)(1) of this section) for a cumulative period of more than thirty (30) minutes in any hour; or

b. The noise standard plus five dB(A) for a cumulative period of more than fifteen (15) minutes in any hour; or

c. The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or

d. The noise standard plus fifteen (15) dB(A) for a cumulative period of more than one minute in any hour; or

e. The noise standard plus twenty (20) dB(A) for any period of time.

C. If the measured ambient level exceeds any of the first four noise limit categories above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

D. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in subsection (B)(1) of this section shall be reduced by five dB(A).

E. Exempt Noises. The following sources of noise are exempt:

1. Motor vehicles not under the control of the industrial use;

2. Emergency equipment, vehicles and devices;

3. Temporary construction, repair, or demolition activities between seven a.m. and seven p.m. except Sundays and federal holidays.

(Ord. 2002-07 Exh. A, 2002; Amended during 1997 codification; Ord. 75 § 2 (part), 1990; SBCC § 87.1305)

16.20.130 - Vibration.

A. Vibration Standard. No ground vibration shall be allowed which can be felt without the aid of instruments at or beyond the lot line; nor will any vibration be permitted which produces a particle velocity greater than or equal to 0.2 inches per second measured at or beyond the lot line.

B. Vibration Measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity or acceleration. Readings are to be made at points of maximum vibration along any lot line next to a residential or commercial district or a community industrial lot.

C. Exempt Vibrations. The following sources of vibration are not regulated by this code:

1. Motor vehicles not under the control of the industrial use;

2. Temporary construction, maintenance or demolition activities between seven a.m. and seven p.m. except Sundays and federal holidays.

(SBCC § 87.1310)

Table 1

SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY
(see Table 4 for detailed description)

Effect	Level	Area
Hearing Loss	$L_{eq(24)} \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leq 45$ dB	Indoor residential areas
	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Explanation of Table 1 :

1. Detailed discussions of the terms L_{dn}, $L_{eq(8)}$ and $L_{eq(24)}$ appear later in the document. Briefly, $L_{eq(8)}$ represents the sound energy averaged over an 8-hour period while $L_{eq(24)}$ energy averages over a 24-hour period. L_{dn} represents the L_{eq} with a 10 dB nighttime weighting.

2. The hearing loss level identified here represents annual averages of the daily level over a period of forty years. (These are energy averages, not to be confused with arithmetic averages.)

entitled under the Commission's Rules of Procedure to participate in a proceeding for a CPCN or a permit to construct may, within 30 days after the notice was mailed or published, object to the granting in whole or in part of the authority sought by the utility and request that the Commission hold hearings on the application. Any such protest shall be filed in accordance with Article 2.5. If the Commission, as a result of its preliminary investigation after such requests, determines that public hearings should be held, notice shall be sent to each person who is entitled to notice or who has requested a hearing.

The Commission's Public Advisor shall provide information to assist the public in submitting such protests.

SECTION XIII. PROTEST TO REQUIRE THE UTILITY TO FILE FOR PERMIT TO CONSTRUCT

Those to whom notice has been given under Section XI.B hereof and any other person or entity entitled to participate in a proceeding for a permit to construct may, within 20 days after the notice was mailed and published, contest any intended construction for which exemption is claimed by the utility from the requirements of Section III.B if such persons or entities have valid reason to believe that any of the conditions described in Section III.B.2 exist or the utility has incorrectly applied an exemption as defined in Section III herein. The protest shall be filed with the CACD, specifying the relevant utility advice letter number, in accordance with General Order 96-A, Section III.H. On the same date a protest is filed with the Commission, the protestant shall serve a copy on the subject utility by mail. The utility shall respond within five business days of receipt and serve copies of its response on each protestant and the CACD. Construction shall not commence until the Executive Director has issued an Executive Resolution.

Within 30 days after the utility has submitted its response, the Executive Director, after consulting with CACD, shall issue an Executive Resolution on whether: the utility is to file an application for a permit to construct, or the protest is dismissed for failure to state a valid reason. Also, the Executive Director shall state the reasons for granting or denying the protest and provide a copy of each Executive Resolution to the Commission's Public Advisor.

The Commission's Public Advisor shall provide information to assist the public in submitting such protests.

SECTION XIV. COMPLAINTS AND PREEMPTION OF LOCAL AUTHORITY

A. Complaints may be filed with the Commission for resolution of any alleged violations of this General Order pursuant to the Commission's Rules of Practice and Procedure 9 through 13.1. A complaint which does not allege that the matter has first been brought to the staff for informal resolution may be referred to the staff to attempt to resolve the matter informally (Rules of Practice and Procedure No. 10).

B. This General Order clarifies that local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric 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. In instances where the public utilities and local agencies are unable to resolve their differences, the Commission shall set a hearing no later than 30 days after the utility or local agency has notified the Commission of the inability to reach agreement on land use matters.

C. Public agencies and other interested parties may contest the construction of under-50-kV distribution lines and electric facilities by filing a complaint with the Commission pursuant to the Commission's Rules of Practice and Procedure 9 through 13.1.

SECTION XV. STATE AGENCY REVIEW OF ELECTRIC GENERATING AND RELATED TRANSMISSION FACILITIES NOT SUBJECT TO THE WARREN-ALQUIST ENERGY RESOURCES CONSERVATION AND DEVELOPMENT ACT

Nothing in this order shall be construed to preempt or otherwise limit the jurisdiction of state agencies other than this Commission to exercise the full range of their jurisdiction under state or federal law over facilities subject to this order.

A coastal development permit shall be obtained from the Coastal Commission for development of facilities subject to this order in the coastal zone.

SECTION IXV. CEQA COMPLIANCE

Construction of facilities for which a CPCN or permit to construct is required pursuant to this General Order shall not commence without either a finding that it can be seen with certainty that there is no possibility that the construction of those facilities may have a significant effect on the environment or that the project is otherwise exempt from CEQA, or the adoption of a final EIR or Negative Declaration. Where authority must be granted for a project by this Commission, applicant shall comply with Rule 17.1 of our Rules of Practice and Procedure:

Special Procedure for Implementation of the CEQA of 1970 (Preparation of EIRs). This latter requirement does not apply to applications covering generating and related transmission facilities for which a certificate authorizing construction of the facilities has been or will also be issued by the CEC. For all issues relating to the siting, design, and construction of electric generating plant or transmission lines as defined in Sections VIII and IX.A herein or electric power lines or substations as defined in Section IX.B herein, the Commission will be the Lead Agency under CEQA, unless a different designation has been negotiated between the Commission and another state agency consistent with CEQA Guidelines § 15051(d).

PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

By WESLEY M. FRANKLIN
Acting
Executive Director

August 11, 1995

APPENDIX C

Complete Noise Monitoring Results

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Lugo Substation Monitoring Data

Serial #	Date	Time	Duration	Leq
SN0190	14Apr 16	13:22:57	2222.6	51.5
SN0190	14Apr 16	14:00:00	3600	50.2
SN0190	14Apr 16	15:00:00	3600	47.7
SN0190	14Apr 16	16:00:00	3600	47.7
SN0190	14Apr 16	17:00:00	3600	43.8
SN0190	14Apr 16	18:00:00	3600	44.4
SN0190	14Apr 16	19:00:00	3600	43.3
SN0190	14Apr 16	20:00:00	3600	41.2
SN0190	14Apr 16	21:00:00	3600	38.9
SN0190	14Apr 16	22:00:00	3600	38.2
SN0190	14Apr 16	23:00:00	3600	38.9
SN0190	15Apr 16	0:00:00	3600	34.9
SN0190	15Apr 16	1:00:00	3600	38.8
SN0190	15Apr 16	2:00:00	3600	34.6
SN0190	15Apr 16	3:00:00	3600	35.3
SN0190	15Apr 16	4:00:00	3600	40.9
SN0190	15Apr 16	5:00:00	3600	42.6
SN0190	15Apr 16	6:00:00	3600	41.9
SN0190	15Apr 16	7:00:00	3600	45.5
SN0190	15Apr 16	8:00:00	3600	46.0
SN0190	15Apr 16	9:00:00	3600	47.0
SN0190	15Apr 16	10:00:00	28.1	49.5

Arrowhead Lake Road Monitoring Data

Serial #	Date	Time	Duration	Leq
SN0462	14Apr 16	12:21:16	2323.9	55.9
SN0462	14Apr 16	13:00:00	3600	48.1
SN0462	14Apr 16	14:00:00	3600	45.8
SN0462	14Apr 16	15:00:00	3600	43.0
SN0462	14Apr 16	16:00:00	3600	47.6
SN0462	14Apr 16	17:00:00	3600	44.5
SN0462	14Apr 16	18:00:00	3600	46.1
SN0462	14Apr 16	19:00:00	3600	45.2
SN0462	14Apr 16	20:00:00	3600	48.2
SN0462	14Apr 16	21:00:00	3600	42.3
SN0462	14Apr 16	22:00:00	3600	43.8
SN0462	14Apr 16	23:00:00	3600	43.0
SN0462	15Apr 16	0:00:00	3600	47.7
SN0462	15Apr 16	1:00:00	3600	49.5
SN0462	15Apr 16	2:00:00	3600	44.0
SN0462	15Apr 16	3:00:00	3600	43.1
SN0462	15Apr 16	4:00:00	3600	48.4
SN0462	15Apr 16	5:00:00	3600	49.0
SN0462	15Apr 16	6:00:00	3600	46.0
SN0462	15Apr 16	7:00:00	3600	47.1
SN0462	15Apr 16	8:00:00	3600	47.0
SN0462	15Apr 16	9:00:00	2524.1	49.5

Deep Creek Road Monitoring Data

Serial #	Date	Time	Duration	Leq
SN0309	14Apr 16	13:50:30	569.3	58.5
SN0309	14Apr 16	14:00:00	3600	48.0
SN0309	14Apr 16	15:00:00	3600	44.6
SN0309	14Apr 16	16:00:00	3600	47.2
SN0309	14Apr 16	17:00:00	3600	41.6
SN0309	14Apr 16	18:00:00	3600	47.3
SN0309	14Apr 16	19:00:00	3600	45.7
SN0309	14Apr 16	20:00:00	3600	39.3
SN0309	14Apr 16	21:00:00	3600	40.8
SN0309	14Apr 16	22:00:00	3600	36.6
SN0309	14Apr 16	23:00:00	3600	36.2
SN0309	15Apr 16	0:00:00	3600	33.5
SN0309	15Apr 16	1:00:00	3600	37.1
SN0309	15Apr 16	2:00:00	3600	33.2
SN0309	15Apr 16	3:00:00	3600	32.7
SN0309	15Apr 16	4:00:00	3600	39.0
SN0309	15Apr 16	5:00:00	3600	38.5
SN0309	15Apr 16	6:00:00	3600	39.4
SN0309	15Apr 16	7:00:00	3600	43.6
SN0309	15Apr 16	8:00:00	3600	42.2
SN0309	15Apr 16	9:00:00	3600	50.7
SN0309	15Apr 16	10:00:00	1141.7	56.9

Ocotillo Way Monitoring Data

Serial #	Date	Time	Duration	Leq
SN0219	14Apr 16	16:16:28	2611.9	64.4
SN0219	14Apr 16	17:00:00	3600	63.8
SN0219	14Apr 16	18:00:00	3600	66.4
SN0219	14Apr 16	19:00:00	3600	61.1
SN0219	14Apr 16	20:00:00	3600	63.0
SN0219	14Apr 16	21:00:00	3600	53.2
SN0219	14Apr 16	22:00:00	3600	58.0
SN0219	14Apr 16	23:00:00	3600	61.2
SN0219	15Apr 16	0:00:00	3600	55.4
SN0219	15Apr 16	1:00:00	3600	43.4
SN0219	15Apr 16	2:00:00	3600	44.7
SN0219	15Apr 16	3:00:00	3600	50.0
SN0219	15Apr 16	4:00:00	3600	40.5
SN0219	15Apr 16	5:00:00	3600	40.3
SN0219	15Apr 16	6:00:00	3600	40.7
SN0219	15Apr 16	7:00:00	3600	43.0
SN0219	15Apr 16	8:00:00	3600	51.1
SN0219	15Apr 16	9:00:00	3600	51.8
SN0219	15Apr 16	10:00:00	2983.1	53.9

Barstow Road Monitoring Data

Serial #	Date	Time	Duration	Leq
SN4085	14Apr 16	18:36:21	1418.8	60.9
SN4085	14Apr 16	19:00:00	3600	56.4
SN4085	14Apr 16	20:00:00	3600	57.9
SN4085	14Apr 16	21:00:00	3600	51.2
SN4085	14Apr 16	22:00:00	3600	54.3
SN4085	14Apr 16	23:00:00	3600	57.3
SN4085	15Apr 16	0:00:00	3600	60.4
SN4085	15Apr 16	1:00:00	3600	62.7
SN4085	15Apr 16	2:00:00	3600	44.4
SN4085	15Apr 16	3:00:00	3600	53.0
SN4085	15Apr 16	4:00:00	3600	55.0
SN4085	15Apr 16	5:00:00	3600	52.3
SN4085	15Apr 16	6:00:00	3600	49.4
SN4085	15Apr 16	7:00:00	3600	51.4
SN4085	15Apr 16	8:00:00	3600	53.4
SN4085	15Apr 16	9:00:00	3600	50.1
SN4085	15Apr 16	10:00:00	3600	48.2
SN4085	15Apr 16	11:00:00	698.2	48.1

Pisgah Substation Monitoring Data

Serial #	Date	Time	Duration	Leq
SN4085	15Apr 16	14:08:54	3065.3	61.8
SN4085	15Apr 16	15:00:00	3600	62.8
SN4085	15Apr 16	16:00:00	3600	59.2
SN4085	15Apr 16	17:00:00	3600	60.6
SN4085	15Apr 16	18:00:00	3600	61.0
SN4085	15Apr 16	19:00:00	3600	56.4
SN4085	15Apr 16	20:00:00	3600	61.1
SN4085	15Apr 16	21:00:00	3600	61.1
SN4085	15Apr 16	22:00:00	3600	58.1
SN4085	15Apr 16	23:00:00	3600	58.1
SN4085	16Apr 16	0:00:00	3600	58.6
SN4085	16Apr 16	1:00:00	3600	58.3
SN4085	16Apr 16	2:00:00	3600	49.0
SN4085	16Apr 16	3:00:00	3600	63.7
SN4085	16Apr 16	4:00:00	3600	62.9
SN4085	16Apr 16	5:00:00	3600	58.4
SN4085	16Apr 16	6:00:00	3600	57.8
SN4085	16Apr 16	7:00:00	3600	56.0
SN4085	16Apr 16	8:00:00	3600	57.5
SN4085	16Apr 16	9:00:00	3600	58.6
SN4085	16Apr 16	10:00:00	3600	59.1
SN4085	16Apr 16	11:00:00	3600	59.5
SN4085	16Apr 16	12:00:00	3465.9	58.0

US-95 Monitoring Data

Serial #	Date	Time	Duration	Leq
SN0309	15Apr 16	23:01:42	3497.2	62.8
SN0309	16Apr 16	0:00:00	3600	61.7
SN0309	16Apr 16	1:00:00	3600	60.3
SN0309	16Apr 16	2:00:00	3600	57.8
SN0309	16Apr 16	3:00:00	3600	58.0
SN0309	16Apr 16	4:00:00	3600	64.9
SN0309	16Apr 16	5:00:00	3600	63.3
SN0309	16Apr 16	6:00:00	3600	65.4
SN0309	16Apr 16	7:00:00	3600	67.5
SN0309	16Apr 16	8:00:00	3600	71.2
SN0309	16Apr 16	9:00:00	3600	72.6
SN0309	16Apr 16	10:00:00	481.3	74.1

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APPENDIX D

Cadna Analysis Data and Results

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Cadna Noise Model - Sound Levels													
Name	**ID**	**Type**	**Oktave Spectrum (dB)**										**Source**
			63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A**	**lin**	
Marvair Compac II	L_1	Lw (c)	94.5	92.1	90.1	85.1	85.2	81.4	74.2	69.8	89.6	98	Measurement at 5 feet
Lift Truck	E_3	Lw (c)	99.3	94.3	95.3	94.3	90.3	91.3	89.3	82.3	97.7	103.2	Defra
Dump Truck	E_4	Lw (c)	111.7	107.7	104.7	101.7	100.7	97.7	94.7	89.7	105.7	114.3	Defra
Boom/Crane Truck	E_5	Lw (c)	111	110	104	105	104	104	95	86	109.2	115.3	Defra
Truck, Semi Tractor	E_8	Lw (c)	127	113	105	104	108	103	102	95	111.6	127.3	Defra
Pickup Truck	E_9	Lw (c)	105.3	91.3	83.3	82.3	86.3	81.3	80.3	73.3	89.9	105.6	FHWA
Track Type Dozer (150 kW)	E_10	Lw (c)	113	119	112	111	106	103	94	88	112.3	121.3	Defra
Drum Type Compactor (Roller	E_12	Lw (c)	111	106	108	103	98	93	85	77	104.6	114.1	Defra
Excavator	E_13	Lw (c)	104	112	106	107	104	101	96	91	109.1	115	Defra
Compressor Trailer	E_14	Lw (c)	106	102	96	101	102	100	93	88	105.9	110	Defra
Puller/Tensioner	E_15	Lw (c)	111	110	104	105	104	104	95	86	109.2	115.3	Defra
Hughes 500C (Hovering)	E_16	Lw (c)					136.5				136.5	136.5	Manufacturer

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	(min/hr)
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558649.2	3848826.5	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558645	3848832.46	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556522.4	3849405.89	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556528	3849400.94	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558646.5	3848829.66	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556525.5	3849403.63	6.1	60

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North - Cap Site 4 - Preferred	R_1	52.2	1.52	11558624.3	3848864.99	1.52
South - Cap Site 4 - Preferred	R_2	52.4	1.52	11558669.2	3848795.13	1.52
North - Cap Site 2 - Preferred	R_3	52.8	1.52	11556498.2	3849431.81	1.52
South - Cap Site 2 - Preferred	R_4	51.7	1.52	11556559.1	3849374.29	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	(min/hr)
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558155.7	3848574.83	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558157.5	3848572.18	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556792.9	3849673.99	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556789.8	3849676.42	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11558156.7	3848573.35	6.1	60
Capacitor Station	C_1	90.9	Lw	L_18	6.1	11556791.3	3849675.24	6.1	60

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North - Cap Site 5 - Alt	R_1	53.4	1.52	11558137.4	3848604.48	1.52
South - Cap Site 5 - Alt	R_2	51.2	1.52	11558181.7	3848533.38	1.52
North - Cap Site 1 - Alt	R_3	51.5	1.52	11556760.3	3849707.39	1.52
South - Cap Site 1 - Alt	R_4	52.1	1.52	11556820.6	3849644.96	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	(min/hr)
Marvair AC Unit	S_1	89.6	Lw	L_1	1.52	11505361	3822975.53	1.52	60

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North	R_1	43.2	1.52	11505357.3	3823018.78	1.52
South	R_2	42.3	1.52	11505363.5	3822924.55	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	(min/hr)
Marvair AC Unit	S_1	89.6	Lw	L_1	1.52	11623576.4	3862448.98	1.52	60

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North	R_1	53.1	1.52	11623571.7	3862464.81	1.52
South	R_2	43.7	1.52	11623592.1	3862407.52	1.52
Pacific Lighting Service Co	R_3	43.3	1.52	11623530.4	3862443.45	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	(min/hr)
Marvair AC Unit	S_1	89.6	Lw	L_1	1.52	11675374.2	3869915.35	1.52	60

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North	R_1	54.0	1.52	11675368.1	3869928.84	1.52
South	R_2	42.9	1.52	11675385.2	3869869.78	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11477452.5	3802694.97	60.96	50 / 20
Helicopter Support Truck	S_2	111.6	Lw	E_8	1.52	11477443.6	3802694.67	1.52	50 / 20

Receivers							
Name	ID	Level Lr	Level Lr	Height	Coordinates		
		50% Heli	20% Heli		X	Y	Z
		(dBA)	(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	78.8	74.8	1.52	11477379.1	3802804.88	1.52
Residence 2	R_2	75.7	71.8	1.52	11477338.4	3802848.95	1.52
Residence 3	R_3	72.5	68.6	1.52	11477214.5	3802830.05	1.52
Residence 4	R_4	78.0	74.1	1.52	11477357.7	3802584.42	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11490711.5	3806799.41	60.96	50 / 20
Helicopter Support Truck	S_2	111.6	Lw	E_8	1.52	11490713.6	3806792.56	1.52	50 / 20

Receivers							
Name	ID	Level Lr	Level Lr	Height	Coordinates		
		50% Heli	20% Heli		X	Y	Z
		(dBA)	(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	71.9	67.9	1.52	11490627.9	3807060.83	1.52
Residence 2	R_2	70.6	66.6	1.52	11490500.9	3807032.89	1.52
Residence 3	R_3	68.9	64.9	1.52	11490404.3	3807013.57	1.52
Residence 4	R_4	67.8	63.8	1.52	11490458.9	3807133.69	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11715446	3892613.24	380.58	50 / 0
Tensioner	S_2	109.2	Lw	E_15	1.52	11715313.1	3892628.36	327.71	50 / 0
Mobile Crane	S_3	109.2	Lw	E_5	1.52	11715354.7	3892611.06	326.37	33
Truck	S_4	111.6	Lw	E_8	1.52	11715324.6	3892622.99	326.98	33
Truck	S_5	111.6	Lw	E_8	1.52	11715325.3	3892619.33	326.66	33
Truck	S_6	111.6	Lw	E_8	1.52	11715337.1	3892609.43	326.83	33
Dozer	S_7	112.3	Lw	E_10	1.52	11715356.2	3892620.29	325.61	17
Helicopter Support Truck	S_8	112.3	Lw	E_10	1.52	11715341.6	3892619.31	326.07	33
Dump Truck	S_9	105.7	Lw	E_4	1.52	11715335.7	3892626.71	326.01	17
Puller	S_10	109.2	Lw	E_15	1.52	11715499.9	3892614.94	316.76	33
Dump Truck	S_11	105.7	Lw	E_4	1.52	11715304.8	3892626.6	328.03	17

Receivers							
Name	ID	Level Lr	Level Lr	Height	Coordinates		
		50% Heli	0% Heli		X	Y	Z
		(dBA)	(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	74.7	48.4	1.52	11715635.7	3892466.63	302.27
Residence 2	R_2	71.8	45.9	1.52	11715744.3	3892473.34	299.02
Residence 3	R_3	69.6	44.5	1.52	11715836.4	3892475.41	295.59
Residence 4	R_4	73.3	47.5	1.52	11715597.3	3892378.09	304.26

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11479068.5	3802733.92	60.96	100
Puller	S_2	109.2	Lw	E_15	1.52	11479639.1	3802762.26	1.52	33
Tensioner	S_3	109.2	Lw	E_15	1.52	11479793.8	3802771.6	1.52	33
Mobile Crane	S_4	109.2	Lw	E_5	1.52	11479656.4	3802760.93	1.52	33
Truck	S_5	111.6	Lw	E_8	1.52	11479645.8	3802747.6	1.52	33
Truck	S_6	111.6	Lw	E_8	1.52	11479625.8	3802748.93	1.52	33
Truck	S_7	111.6	Lw	E_8	1.52	11479645.8	3802779.6	1.52	33
Dozer	S_8	112.3	Lw	E_10	1.52	11479616.4	3802756.93	1.52	17
Helicopter Support Truck	S_9	112.3	Lw	E_10	1.52	11479068.5	3802734.28	1.52	33
Dump Truck	S_10	105.7	Lw	E_4	1.52	11479664.4	3802779.6	1.52	33
Dump Truck	S_11	109.2	Lw	E_15	1.52	11479633.8	3802736.93	1.52	33

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		100% Heli		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	73.3	1.52	11478932.5	3803028.91	1.52
Residence 2	R_2	69.3	1.52	11479306.9	3803158.11	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11479297.5	3802808.56	60.96	100
Puller	S_2	109.2	Lw	E_15	1.52	11479639.1	3802762.26	1.52	33
Tensioner	S_3	109.2	Lw	E_15	1.52	11479793.8	3802771.6	1.52	33
Mobile Crane	S_4	109.2	Lw	E_5	1.52	11479656.4	3802760.93	1.52	33
Truck	S_5	111.6	Lw	E_8	1.52	11479645.8	3802747.6	1.52	33
Truck	S_6	111.6	Lw	E_8	1.52	11479625.8	3802748.93	1.52	33
Truck	S_7	111.6	Lw	E_8	1.52	11479645.8	3802779.6	1.52	33
Dozer	S_8	112.3	Lw	E_10	1.52	11479616.4	3802756.93	1.52	17
Helicopter Support Truck	S_9	112.3	Lw	E_10	1.52	11479297.7	3802808.93	1.52	33
Dump Truck	S_10	105.7	Lw	E_4	1.52	11479664.4	3802779.6	1.52	33
Dump Truck	S_11	109.2	Lw	E_15	1.52	11479633.8	3802736.93	1.52	33

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		100% Heli		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	70.6	1.52	11478932.5	3803028.91	1.52
Residence 2	R_2	72.6	1.52	11479306.9	3803158.11	1.52

Point Sources									
Name	ID	Result. PWL	Lw / Li		Height	Coordinates			Operating Time
		Day	Type	Value		X	Y	Z	
		(dBA)			(m)	(m)	(m)	(m)	% of workday
Helicopter	S_1	136.5	Lw	E_16	60.96	11479717.4	3802754.8	60.96	100
Puller	S_2	109.2	Lw	E_15	1.52	11479639.1	3802762.26	1.52	33
Tensioner	S_3	109.2	Lw	E_15	1.52	11479793.8	3802771.6	1.52	33
Mobile Crane	S_4	109.2	Lw	E_5	1.52	11479656.4	3802760.93	1.52	33
Truck	S_5	111.6	Lw	E_8	1.52	11479645.8	3802747.6	1.52	33
Truck	S_6	111.6	Lw	E_8	1.52	11479625.8	3802748.93	1.52	33
Truck	S_7	111.6	Lw	E_8	1.52	11479645.8	3802779.6	1.52	33
Dozer	S_8	112.3	Lw	E_10	1.52	11479616.4	3802756.93	1.52	17
Helicopter Support Truck	S_9	112.3	Lw	E_10	1.52	11479710.5	3802758.2	1.52	33
Dump Truck	S_10	105.7	Lw	E_4	1.52	11479664.4	3802779.6	1.52	33
Dump Truck	S_11	109.2	Lw	E_15	1.52	11479633.8	3802736.93	1.52	33

Receivers						
Name	ID	Level Lr	Height	Coordinates		
		100% Heli		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
Residence 1	R_1	60.5	1.52	11478932.5	3803028.91	1.52
Residence 2	R_2	64.6	1.52	11479306.9	3803158.11	1.52