

SDG&E ECO PTC Application A.09-08-003
CPUC ED DR15, Issued 8/8/11
SDG&E's 8/19/11 Response

Noise

1. Please provide a noise analysis for the 138 kV Old Highway 80 – Carrizo Gorge Road reroute alternative for the residential properties near the proposed reroute alignment. If the noise analysis indicates that the noise associated with construction activities would exceed the applicable County of San Diego Noise Ordinance construction noise threshold (i.e.; 8-hour average of 75 dB between the hours of 7 a.m. and 7 p.m.), please suggest approved operational considerations (for example, restriction of construction activities to 5 hours instead of 8 hours a day). As needed, please expand upon existing noise-related applicant proposed measures (APMs) that would ensure that construction activities would comply with the County of San Diego Noise Ordinance noise level limits.

SDG&E Response 1:

In response to the California Public Utilities Commission request, Acentech Incorporated (Acentech) conducted an analysis and calculations in August of 2011 to analyze the potential noise impacts from undergrounding of the 138 kV transmission line along Old Highway 80 and Carrizo Gorge Road. The discussion that follows summarizes their findings and identifies an additional APM that is recommended to reduce potential Proposed Project impacts to a less-than-significant level. Acentech's letter report has been included in Attachment A: Acentech Noise Report.

Noise limits in the East County Substation Project (Proposed Project) area are set by the County of San Diego Noise Ordinance. Construction noise cannot exceed 75 A-weighted decibels (dBA) at a residence for an eight-hour period between 7 a.m. and 7 p.m. In addition, impulsive noise levels cannot exceed a maximum of 82 dBA at a residence.

Based on Google Earth imagery and San Diego County parcel data, approximately eight single-family residences¹ were identified within 2,000 feet of the proposed Old Highway 80 – Carrizo Gorge Road Reroute. One residence is located approximately 1,580 feet north of the alignment and directly adjacent to Interstate-8. The remaining seven residences are located near the intersection of Old Highway 80 and Carrizo Gorge Road. The closest of these residences is located approximately 200 feet southwest of the alignment.

A list of equipment required to construct this portion of the Proposed Project, their average daily operating hours, maximum noise levels (L_{max})² at a reference distance of 50 feet, use factors,

¹ Residences have not been field verified.

² L_{max} values and use factors were determined using the United States Department of Transportation Federal Highway Administration Roadway Construction Noise Model Version 1. A reference distance of 50 feet was used

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and the eight-hour equivalent noise level (Leq) at 50 feet was compiled. A summary of this information has been included as Table 1: Construction Equipment and Reference Noise Levels.

The Lmax at each residence from jackhammer use (an impulsive noise source) and the eight-hour average Leq from all construction equipment was then calculated. The results of these calculations are presented in Table 2: Estimated Noise Levels at Residential Locations. In all cases, the proposed underground alignment was assumed to be between the roadway and the residence. The calculated Lmax from jackhammer use is less than 82 dBA; therefore, these activities will be in compliance with the San Diego County impulsive noise standards. The maximum eight-hour average Leq, without the implementation of any applicant-proposed measures (APMs), will be approximately 76 dBA at the closest residence, exceeding the San Diego County standards by one dBA at one location. The maximum Leq at the remaining seven residential locations is approximately 71 dB, which is under the applicable standard. The eight-hour average Leq was recalculated at the nearest residence with the jackhammers omitted and the resulting noise level at the nearest residence was 75 dBA, which is in compliance with the San Diego County noise standards.

Because the use of jackhammers may be required in proximity to residences, a three-sided, portable barrier with a height of at least seven feet, placed between the jackhammers and the residence, was introduced into the calculations. It was assumed that the portable barrier will be placed within five feet of each jackhammer. The barrier resulted in an approximate 5-dBA reduction in jackhammer noise. When included in the calculation for all construction equipment, the eight-hour Leq is reduced to a maximum of 75 dBA. As a result, when jackhammers are used in conjunction with a portable barrier, all construction activities will be in compliance with the San Diego County noise standards.

In order to ensure that noise levels associated with the construction of this portion of the Proposed Project are in compliance with the San Diego County noise standards, SDG&E is proposing the following APM:

- APM-NOI-XX: If the use of a jackhammer is required for construction activities located within 200 feet of any occupied residence, a three-sided, portable barrier measuring at least seven feet tall will be placed within five feet of the jackhammer between it and the residence.

for all pieces of equipment except for the backup alarm. A reference value of 4 feet and an Lmax of 103 dBA was determined from Operational Safety and Health Administration guidelines.

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Table 1: Construction Equipment and Reference Noise Levels

Equipment	Approximate Quantity	Average Duration of Use (hours per day)	Lmax at Reference Distance (dBA)	Use Factor	Eight-Hour Leq at 50 Feet (dBA)
¾-ton or 1-ton pickup truck	6	2	75	40%	72.8
Air compressors	2	4	78	40%	74.0
Maintenance truck	1	2	79	20%	66.0
Concrete truck	4	2	82	40%	78.0
HDD Rig	2	6	82	20%	76.8
Backhoe	1	6	79	40%	73.8
Fork lift/skid steer	1	4	80	40%	73.0
Light duty crane	1	4	81	16%	70.0
Trencher/Ditch witch	1	6	80	50%	75.7
Loader	1	6	79	40%	73.8
Water truck	1	2	80	40%	70.0
Compactor -handheld	2	4	80	20%	73.0
Vibrating roller	1	6	80	25%	72.7
Pneumatic Tools (Impulsive Noise)	2	4	89	20%	82.0
Dump truck	2	6	76	40%	73.8
Backup Alarm	20	6	103	5%	79.8

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Table 2: Estimated Noise Levels at Residential Locations

Distance to Residence (feet)	Orientation of Residence to Project	Residence Location		Lmax from Jackhammer Use (dBA)	Project 8-Hour Leq Unmitigated (dBA)		Project 8-Hour Leq with APM (dBA)
		Latitude	Longitude		With Jackhammer	Without Jackhammer	
1580	North of alignment, near Interstate 8	32°38'5.18"N	116° 7'40.49"W	59	58	57	57
1450	Southeast of alignment	32°37'2.59"N	116° 9'22.26"W	60	59	58	58
400	Southwest of Old Highway 80/Carrizo Gorge Road	32°37'12.17"N	116° 9'32.88"W	71	70	69	69
200	Southwest of Carrizo Gorge Road	32°37'17.09"N	116° 9'34.02"W	77	76	75	75
335	Southwest of Carrizo Gorge Road	32°37'15.32"N	116° 9'34.52"W	72	71	70	70
450	Southwest of Carrizo Gorge Road	32°37'14.63"N	116° 9'35.57"W	70	69	68	68
475	Southwest of Carrizo Gorge Road	32°37'15.37"N	116° 9'36.51"W	69	68	67	67
750	Southwest of Carrizo Gorge Road	32°37'16.10"N	116° 9'40.65"W	65	64	63	63

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2. The GIS data provided by SDG&E for the 138 kV reroute alignment provided trenching data along the south side of Old Highway 80 and on the west side of Carrizo Gorge Road. Please confirm these are the preferred alignments proposed by SDG&E for the 138 kV reroute alignment.

SDG&E Response 2:

The GIS data provided to the California Public Utilities Commission depicts two underground duct bank packages that will be located on either side of Highway 80 and Carrizo Gorge Road. As part of this Project, SDG&E proposes to build out the underground infrastructure (vaults and conduit) for TL13844 and the future transmission line. The actual duct bank that will be used for TL13844 has not yet been determined at this stage of the design.

ATTACHMENT A: ACENTECH NOISE REPORT

17 August, 2011

Ms. Anne Marie McGraw
Insignia Environmental
258 High Street
Palo Alto, CA 94301

Subject: Acentech Response to Data Request No. 15 – San Diego Gas & Electric (“Applicant”),
East County Substation Project (PTC Application No. 09.08.003)

Dear Anne Marie:

The California Public Utilities Commission (CPUC) has requested additional information regarding the proposed 138 kV Old Highway 80 – Carrizo Gorge Road underground reroute:

Noise

- 1. Please provide a noise analysis for the 138 kV Old Highway 80 – Carrizo Gorge Road reroute alternative for the residential properties near the proposed reroute alignment. If the noise analysis indicates that the noise associated with construction activities would exceed the applicable County of San Diego Noise Ordinance construction noise threshold (i.e.; 8-hour average of 75 dB between the hours of 7 a.m. and 7 p.m.), please suggest approved operational considerations (for example, restriction of construction activities to 5 hours instead of 8 hours a day). As needed, please expand upon existing noise-related applicant proposed measures (APMs) that would ensure that construction activities would comply with the County of San Diego Noise Ordinance noise level limits.*
- 2. The GIS data provided by SDG&E for the 138 kV reroute alignment provided trenching data along the south side of Old Highway 80 and on the west side of Carrizo Gorge Road. Please confirm these are the preferred alignments proposed by SDG&E for the 138 kV reroute alignment.*

Noise limits are set by the County of San Diego Noise Ordinance. Construction noise cannot exceed the County’s threshold of 75 dBA at a residence for an eight-hour period, between 7 a.m. and 7 p.m. In addition, impulsive noise levels cannot exceed a maximum of 82 dBA at a residence.

In response to this request, Acentech has calculated the noise levels at identified residences within 2,000 feet of the proposed 138 kV underground construction. **Table 1** presents the equipment sources, numbers of equipment, duration of daily operation, maximum noise level at 50 feet, the use factor, and the resulting 8-hr Leq at 50 ft.

Figure 1 shows the eight residential locations identified within 2,000 ft of the construction of the proposed Underground route (shown in Red). There is one resident located just south of I-80 shown on the upper right corner of the figure. The remaining seven residences are located near the intersection of Old Highway 80 and Carrizo Gorge Road.

Figure 1: Residential Locations Near the Proposed 138 kV Underground Route



Table 2 presents the calculated maximum noise levels at each of the residential locations from the jackhammer (an impulsive noise source) and the 8-hour average Leq from all construction activity. In all cases the proposed 138kV underground alignment was assumed to be between the roadway and the residence. The calculated maximum noise level (Lmax) from a jackhammer was less than 82 dBA and the construction would be in compliance with the County code related to impulsive noise. The 8-hr average Leq at one residence was 76 dBA, exceeding the County Code by 1 decibel.

Mitigation alternatives:

1. A 3-sided portable barrier with a height of at least 7-ft, placed between the jackhammers and the residence. A portable barrier should be placed within 5 ft of each jackhammer. A 5 decibel reduction for the jackhammer noise is calculated and the calculated 8-hr Leq will be reduced to 75 dBA. This mitigation would reduce the 8-hr average noise level by 1 decibel as shown in the last column of Table 2.
2. Days where construction activities do not include jackhammers would also be within compliance of the County Code limits.
3. Reduce hours of construction activity to $\frac{3}{4}$ of the average duration shown in Table 1.

Any one of the above mitigations would result on construction noise complying with the County of San Diego Noise Ordinance 8-hr average noise level limits.

We believe that this analysis is fully responsive to the CPUC request. Please call me if there are additional requests or you require clarification.

Sincerely yours,

ACENTECH INCORPORATED



Ramon E. Nugent, P.E. (TX)
Director

Attachments

Table 1: Noise Calculation Assumptions

Table 2: Estimated Noise Levels at Nearest Residences Near the Proposed 138 kV
Underground Route

Table 1: Noise Calculation Assumptions

Equipment	Use	Approximate Quantity	Average Duration of Use (hours per day)	Lmax @ Dref *	Dref, ft	Use Factor *	Leq(8-hr) @ 50 ft
¾-ton or 1-ton pickup truck	Transport and support construction personnel	6	2	75	50	40%	72.8
Air compressors	Operate air tools	2	4	78	50	40%	74.0
Maintenance truck	Maintain and refuel equipment	1	2	79	50	20%	66.0
Concrete truck	Pour concrete	4	2	82	50	40%	78.0
HDD Rig	Install conduit	2	6	82	50	20%	76.8
Backhoe	Excavate pad foundations	1	6	79	50	40%	73.8
Fork lift/skid steer	Move rebar, equipment, masonry, and other materials	1	4	80	50	40%	73.0
Light duty crane	Place material and set steel	1	4	81	50	16%	70.0
Trencher/Ditch witch	Excavate trenches	1	6	80	50	50%	75.7
Loader	Load excavated material	1	6	79	50	40%	73.8
Water truck	Suppress dust	1	2	80	50	40%	70.0
Compactor - handheld	Compact soil	2	4	80	50	20%	73.0
Vibrating roller	Compact soil	1	6	80	50	25%	72.7
Pneumatic Tools**	Jack hammers	2	4	89	50	20%	82.0
Dump truck	Remove spoil from site	2	6	76	50	40%	73.8
Backup Alarm ***		20	6	103	4	5%	79.8
8-hr Leq at 50 ft							87.8

* FHWA Roadway Construction Noise Model, DOT, Jan 2006

** Impulsive

*** Based upon OSHA Back-up alarm requirements

Table 2: Estimated Noise Levels at Nearest Residences Near the Proposed 138 kV Underground Route

Feet from Trench to Residence	Location	Lat	Long	Jackhammer Lmax	Project 8-hr Leq Unmitigated	Project 8-hr Leq Mitigated
1580	N of alignment, near I-80	32°38'5.18"N	116° 7'40.49"W	59	58	57
1450	SSE of alignment	32°37'2.59"N	116° 9'22.26"W	60	59	58
400	SW of Old Highway 80/Carrizo Gorge Road	32°37'12.17"N	116° 9'32.88"W	71	70	69
200	WSW of Carrizo Gorge Road	32°37'17.09"N	116° 9'34.02"W	77	76	75
335	WSW of Carrizo Gorge Road	32°37'15.32"N	116° 9'34.52"W	72	71	70
450	WSW of Carrizo Gorge Road	32°37'14.63"N	116° 9'35.57"W	70	69	68
475	WSW of Carrizo Gorge Road	32°37'15.37"N	116° 9'36.51"W	69	68	67
750	WSW of Carrizo Gorge Road	32°37'16.10"N	116° 9'40.65"W	65	64	63