NOISE ASSESSMENT

NLP VALLEY CENTER SOLAR
PDS2013-MUP-13-019
ENVIRONMENTAL LOG NO. 13-02-002

Prepared for:

County of San Diego
Department of Planning and Development Services
Contact: Emmet Aquino
5510 Overland Avenue, Suite 110
San Diego, CA 92123
858-694-8845

Prepared By:

Jeremy Louden
Ldn Consulting, Inc.
42428 Chisolm Trail
Murrieta, California 92562
760-473-1253

Project Proponent:

NLP Valley Center LLC.
Contact: Patrick Brown
17901 Von Karman Ave, Ste. 1050
Irvine, CA 92614

August 14, 2015

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ATTACHMENTS

GLOSSARY OF TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref}).

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (Ldn): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for night time noise. Typically Ldn's are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the development of the proposed North Light Power (NLP) Valley Center Solar Project located on two parcels totaling approximately 66 gross acres. The Project is located in the unincorporated community of Valley Center in the northern portion of San Diego County, CA.

Operational Noise

Based on the empirical data, the manufacturers specifications and the distances to the property lines the unshielded cumulative noise levels from the proposed transformers/inverters and tracker motors were found to be below the most restrictive nighttime property line standard of 45 dBA at the adjacent properties zoned A-70. No impacts are anticipated and no mitigation is required.

Panel washing is anticipated to occur approximately four times per year and would take approximately 4 weeks to complete. Washing of the photovoltaic panels/arrays would generally occur during the daytime hours of 7am -10pm. To reduce the noise level below the County's most restrictive 50 dBA threshold, the wash station would need to be located 65 feet from the nearest property line. No direct or cumulative no impacts are anticipated and no mitigation measures are required.

At a distance as close as 100 feet, the point source noise attenuation from the grading activities and the nearest property line is -16.0 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 74.3 dBA at the property line. During the installation of the solar panels, a noise level of 74.9 dBA would result at a distance of 275 feet. The installation equipment is anticipated to average a distance of more than 300 feet from the nearest property line. Given this and the spatial separation of the equipment over the large site area, the noise levels of the grading and panel installation are anticipated to comply with the County of San Diego's 75 dBA standard at all Project property lines.

Construction Noise

Additionally, the County Noise Ordinance Section 36.410, states that no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown of 82 dBA (at residential uses), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. To reduce the maximum noise level of 95 dBA to 82 dBA the pile driver would need to be located 215 feet from the nearest occupied residential property line or only operate 25% of the hourly or daily duration (15 minutes of any hour and 2 hours of an 8 hour work day) when located within that distance.

Based on these duration and distance parameters the impulsive noise levels are anticipated to be below the County's most restrictive 82 dBA threshold and no impacts are anticipated and no mitigation measures are required. The County Noise Ordinance pertains to a property having an occupied structure. Currently, most of the adjacent properties have existing occupied structures. As a noise design measure, the Project will meet the 215 foot setback for the pile drivers or a 25% time restriction to comply with the Noise Ordinance Sections 36.408-36.410 at those occupied properties. If additional properties become occupied prior to or during the construction of the Project then the 215 foot setback for the pile drivers or a 25% time restriction would also apply.

1.0 INTRODUCTION

This noise study was completed to determine the noise impacts associated with the development of the proposed NLP Valley Center Photovoltaic (PV) Solar Project. The Project is located at 33°15 02" N and 117° 01' 22" W, near the community of Valley Center in northern San Diego County. The proposed NLP Valley Center Solar Project (proposed "Project") site is located in the community of Valley Center, California in north-central San Diego County. The subject site is located at 29471 Cole Grade Road and is bordered by Cole Grade Road to the west; Via Valencia extends eastward from Cole Grade Road. The property is comprised of two separate parcels which include County Assessor Parcel Numbers (APNs) 188-120-09 and -10, totaling approximately 66 acres. The general location of the Project is shown on the Vicinity Map, Figure 1-A.

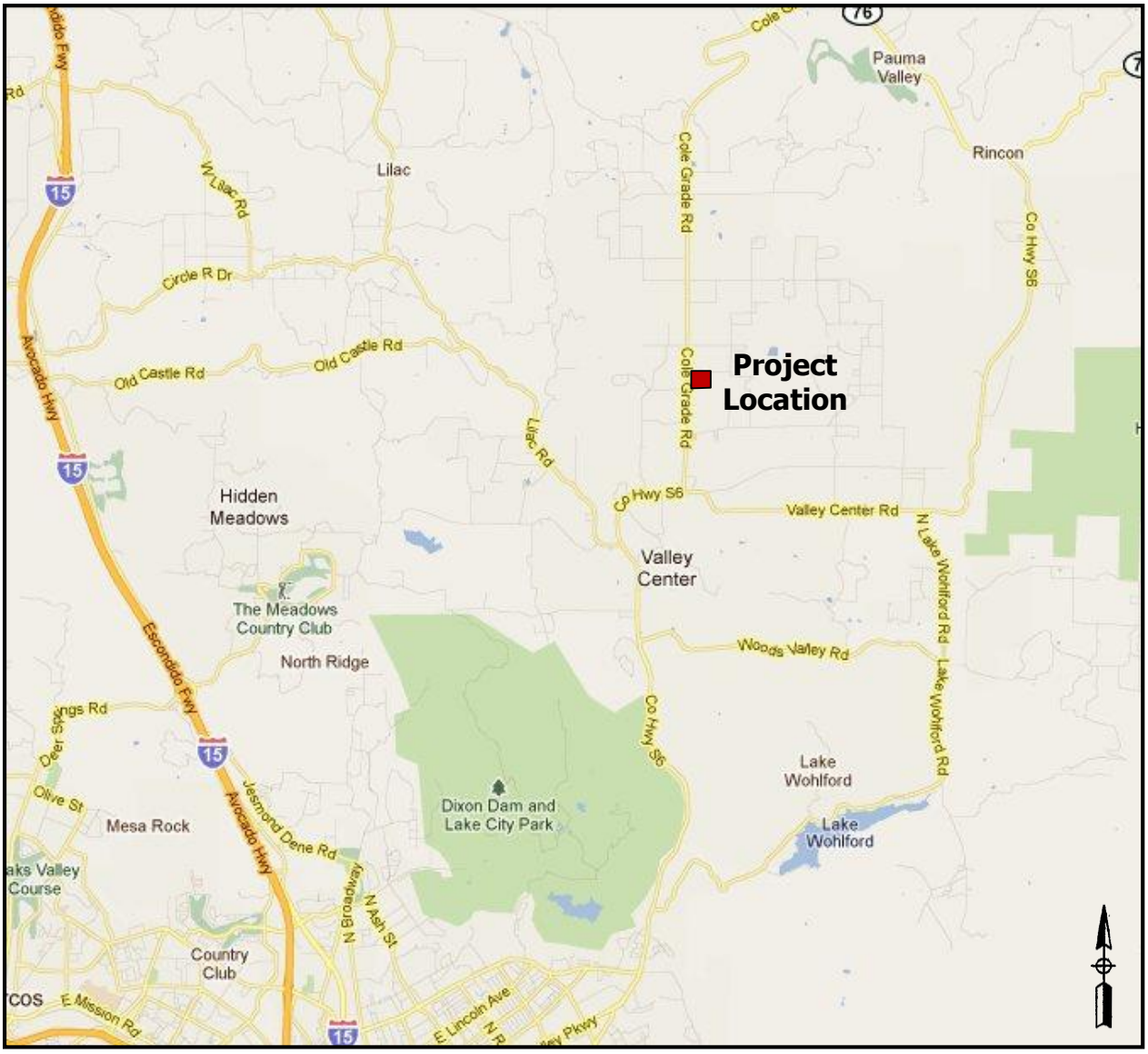
1.1 Project Description

The Project requires approval from the County of San Diego for a Major Use Permit (MUP) for the construction, operation, and maintenance of an unmanned PV Solar facilities for the long-term generation of solar-generated energy. The proposed approximate 26-acre photovoltaic (PV) solar facility will encompass a portion of the approximate 66-acre property to achieve the intended megawatt (MW) output. The Project design will consist of PV solar panels mounted on a collection of single-axis tracking (SAT) systems. The single axis system proposes solar panels aligned in rows that rotate to face east in the morning and west in the afternoon hours, tracking the sun about a north/south axis to maximize solar absorption. The project will require a balanced cut and fill grading quantity of 6,000 cubic yards.

The point of interconnection (POI) for transmission purposes will occur at an existing utility pole within the Cole Grade Road right-of-way (ROW) adjacent to the Project boundary. Permanent access to the site will be from Cole Grade Road. No offsite roadway improvements are required.

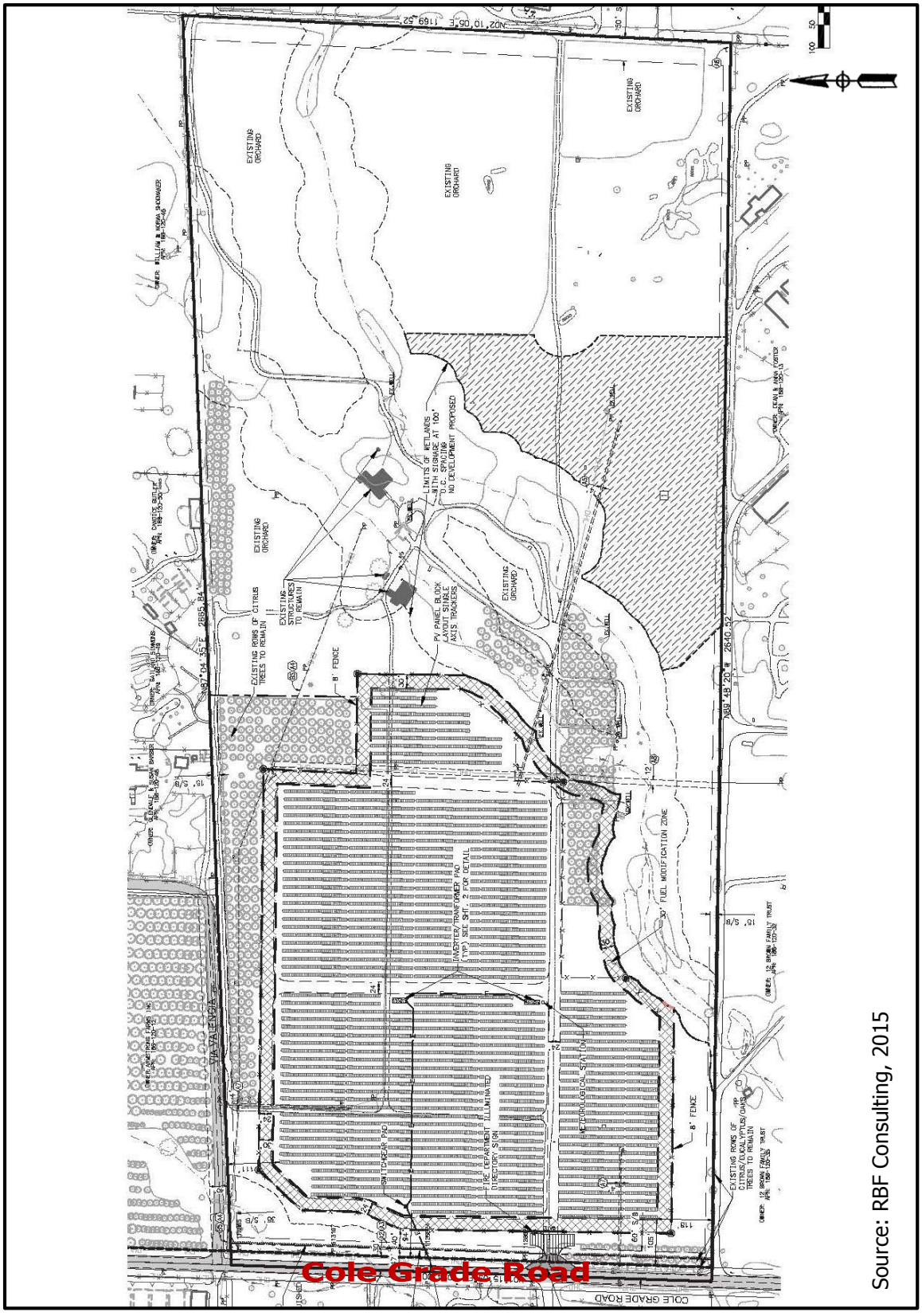
The ultimate arrangement/number of PV solar panels, racking, inverter pads and structures, and internal access driveways are shown on the MUP Plot Plan to illustrate the general configuration of the proposed solar collection system; however, this layout is subject to modification at final engineering design. The project site configuration and layout is provided in Figure 1-B on the following page.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 2013

Figure 1-B: Overall Project Layout



1.2 Environmental Settings & Existing Conditions

a) Settings & Locations

The Project would consist of a PV solar generation project on a single parcel of land to allow for the transport of the power generated to an existing SDG&E transmission line. The affected County Assessor Parcel Numbers (APNs) 188-120-09 and -10 total approximately 66 acres; however, only a 25 acre portion of the subject parcels would be developed as part of the Project and under the control of the MUP. The zoning for the Project parcel and all surrounding land uses is Rural Residential (RR) or residential/agricultural (A-70).

b) Existing Noise Conditions

The Project is located east of Cole Grade Road and permanent access to the site will be from Cole Grade Road via an existing driveway. Cole Grade Road is classified as a two-lane Collector roadway in the County of San Diego's Circulation Element. Existing noise occurs mainly from infrequent vehicular traffic traveling on nearby Cole Grade Road.

1.3 Methodology

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs.

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder. Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic

noise or acoustical energy results in a noise level increase of 3 dBA. Therefore the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiant in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation. On the other hand, fixed/point sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.

The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods could be required to reduce noise levels to an acceptable level.

2.0 OPERATIONAL ACTIVITIES

2.1 Guidelines for the Determination of Significance

Section 36.404 of the County of San Diego noise ordinance provides performance standards and noise control guidelines for determining and mitigating non-transportation, or stationary, noise source impacts to adjacent properties. The purpose of the noise ordinance is to protect, create and maintain an environment free from noise that may jeopardize the health or welfare, or degrade the quality of life. The County Noise Ordinance states that it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits provided in Table 2-1.

Table 2-1: Sound Level Limits in Decibels (dBA)

ZONE		APPLICABLE LIMIT ONE-HOUR AVERAGE SOUND LEVEL (DECIBELS)
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5. Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
S-94, V4, and all other commercial zones.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
V1, V2 V1, V2 V1 V2	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m. 10 p.m. to 7 a.m.	60 55 55 50
V3	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	70 65
M-50, M-52, M-54	Anytime	70
S-82, M-58, and all other industrial zones.	Anytime	75

Source: County of San Diego Noise Ordinance Section 36.404

As stated above in Section 1, the Project and surrounding properties are zoned Rural Residential (RR) and residential/agricultural (A-70). Section 36.404 of the Noise Ordinance sets a most restrictive operational exterior noise limit for the RR and A-70 noise sensitive land uses of 50 dBA Leq for daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq during the noise sensitive nighttime

hours of 10 p.m. to 7 a.m. as shown in Table 2-1 above. Most of the Project components will only operate during the daytime hours but a few may operate during nighttime or early morning hours and therefore the most restrictive and conservative approach is to apply the 45 dBA Leq nighttime standard at the property lines.

2.2 Potential Operational Noise Impacts

This section examines the potential stationary noise source impacts associated with the operation of the proposed Project. Specifically, noise levels from the proposed transformers, inverters and project maintenance. The electrical current is then transferred to the inverters, which convert the Direct Current (DC) produced by the PV panels into Alternating Current (AC). A pad-mounted transformer next to the inverter would increase the voltage and send it through underground gathering lines to connect to existing distribution lines.

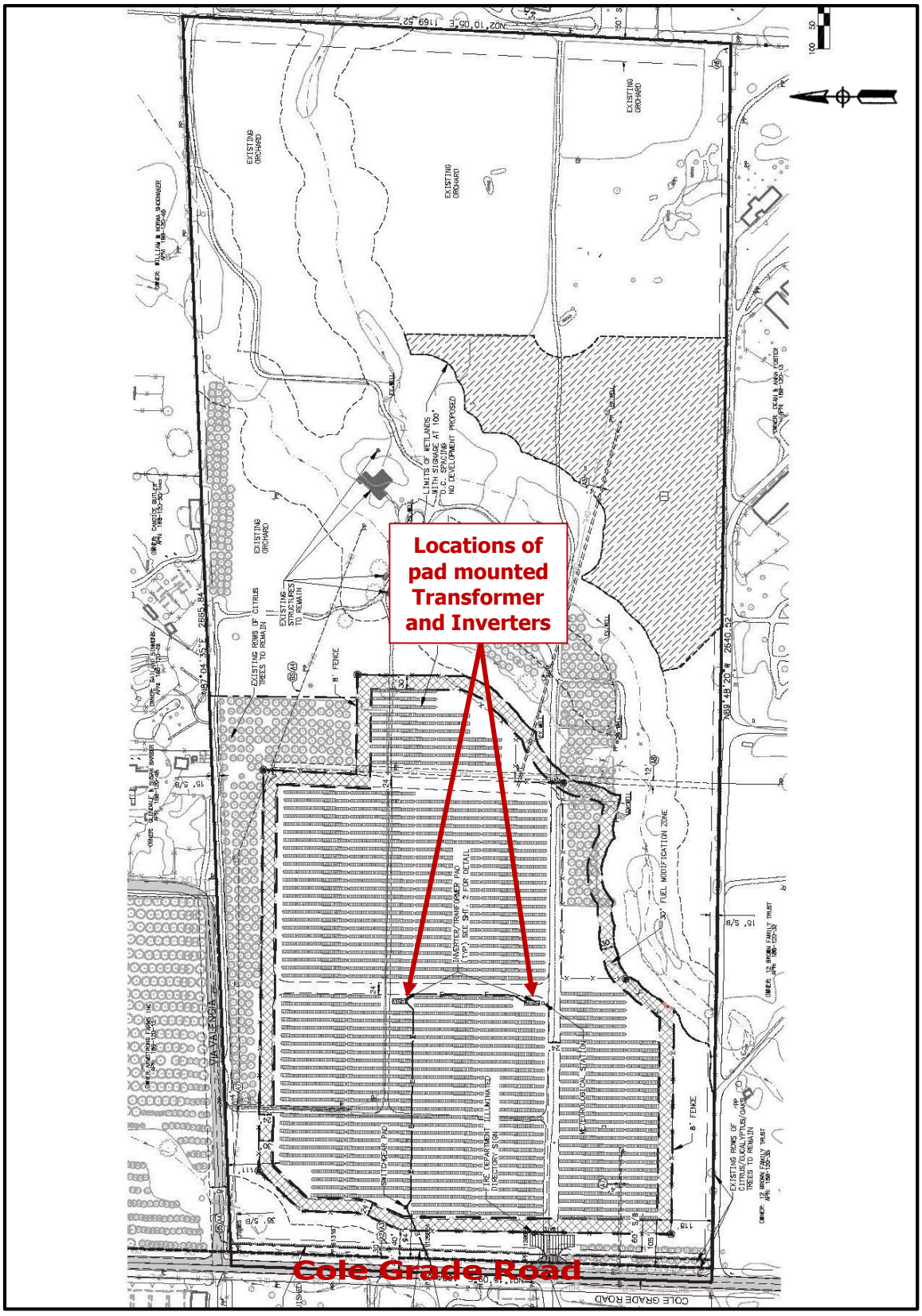
The Project proposes the installation of two small-scale, above ground structures that would be located within the solar panel fields, near the center sections of the site where needed, to shade inverter/distributor transformers and switching gear. Each of these locations will house two Commercial Solar PV Inverters and one of the smaller transformers necessary to increase the voltage. The proposed inverter/transformer pad locations for the site can be seen in Figure 2-A on the following page. The solar racking system will be equipped with a tracker motor to rotate the PV panels. The project is not proposing any back-up generators. Additionally, an operation and maintenance contractor would wash the panels twice each year using a four-man crew.

2.2.1 Operational Equipment Noise Levels On-site

Energy generated by the Project would be delivered to an existing distribution line along Cole Grade Road. Connection would be made from the Project to the Point of Interconnect and no substation is needed or proposed. The Project is proposing small-scaled transformers as part of the proposed inverter / transformer sites. The proposed transformers have an unshielded noise rating of less than 60 dBA at 5 feet *(Source: National Electric Manufactures Association (NEMA) Publication No. TR 1-1993)*.

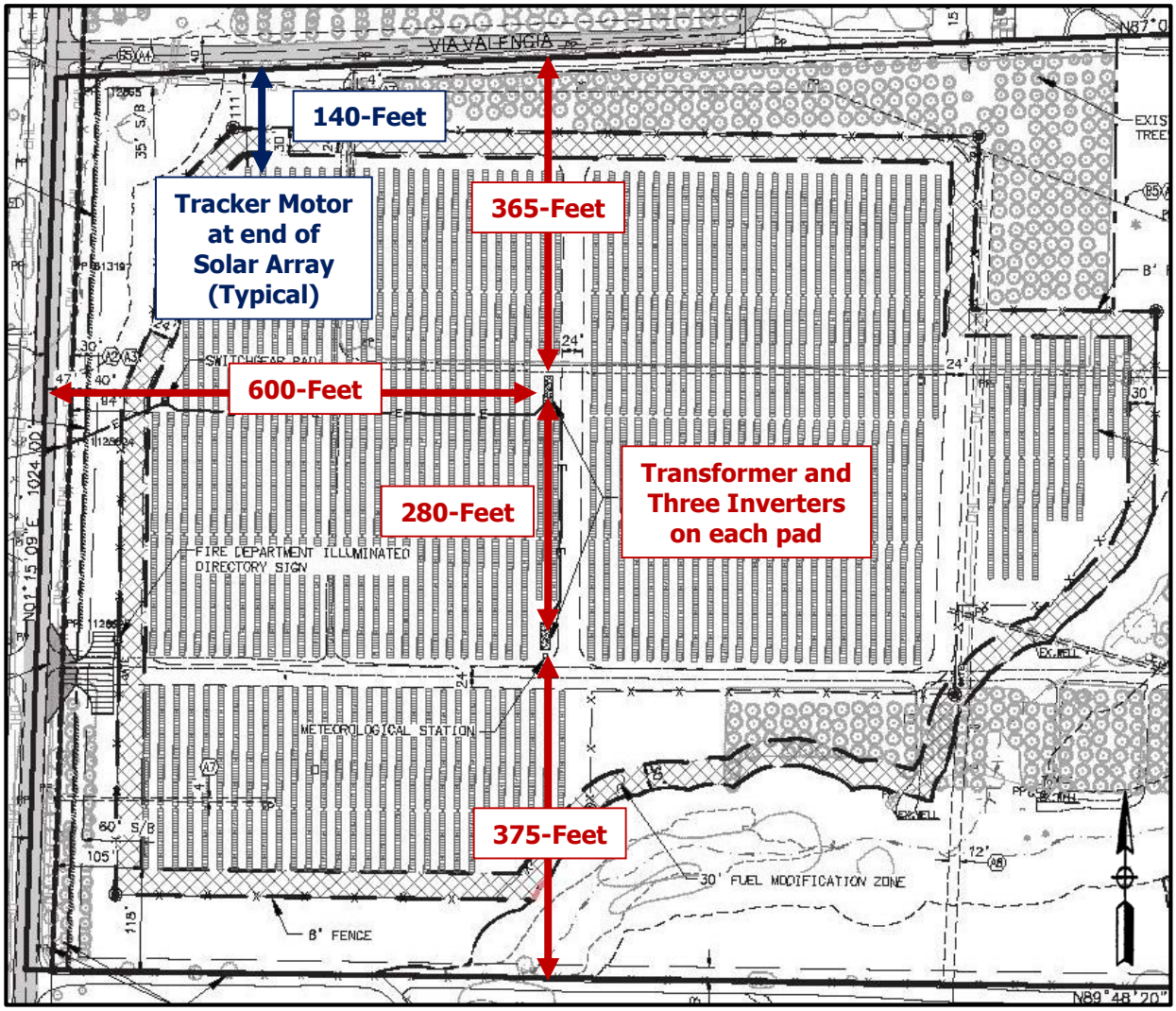
There will be three AE 500 NX inverters along with each small transformer. The proposed 500 KW Solar PV Inverters have unshielded noise rating of 65.4 dBA at 3 meters (10 feet) *(Source: Advanced Energy Industries, 2008)*. The array tracker motors were found to have a cumulative noise level of 39 dBA at a distance of 100 feet *(Source: Nellis Solar Power Plant Noise Measurements - JBA Consulting Engineers, 2010).* The NEMA test results for the transformers, the proposed inverters manufacturer's specifications and the array tracker noise findings letter are provided as ***Attachment A*** of this report.

Figure 2-A: Proposed Equipment Locations



The worst case property line noise levels will occurs at the northern and southern property lines where a transformer and three AE 500 NX inverters, as a noise design measure, are located 365 feet and 375 feet from the respective property lines and the second pad with a transformer and AE 500 NX three inverters are located 645 feet from the same property line which are zoned RR and have a nighttime property line standard of 45 dBA. The remainder of the transformers and invertors on the site are at least 600 feet from the nearest property lines. The worst case scenario is analyzed below to determine if impacts would occur and if additional analysis is warranted and if any mitigation measures will be required. Therefore, the worst-case noise exposure would occur at the northern portion of the site. The location and relationship to the property lines based on the site configuration is shown in Figure 2-B below.

Figure 2-B: Worst Case Property Line Orientation



The noise levels from the proposed tracker motors and blowers combined was found to be 38.0 dBA at 50 feet based on empirical data collected by AECOM on September 30, 2011. This noise level would be the hourly level if the equipment were to operate for an entire hour. However, the required operation time of the tracker motor is anticipated to operate only 15-20 minutes of any given hour. To be conservative, if the equipment were to operate for half an hour, then the hourly combined level of 38.0 dBA Leq for continuous operation would be reduced to 35.0 dBA Leq. Therefore, a combined noise level of 35.0 dBA Leq was utilized.

To determine the cumulative noise levels of multiple trackers, the distances of an array of the 16 closest units at a common point, were measured and the noise levels were propagated to that common point. Based on the spacing of the units, at a distance over 200 feet of more away and the noise level would drop 12 dBA Leq and would not cumulatively add to the overall noise levels. The noise levels of 60 dBA for the transformers and 65.4 dBA for the three inverters were propagated out to the property line. All the noise producing equipment was cumulatively combined without any shielding. The results of the propagated noise levels to the nearest property line are shown in Table 2-2.

Table 2-2: Operational Noise Levels – Nearest Property Line

Source	Noise Level (dBA)[1]	Quantity	Cumulative Noise Level (dBA)	Distance to Nearest Property Line (Feet)	Noise Reduction due to distance (dBA)	Resultant Noise Level @ Property Line (dBA)
Transformer	**60.0**	**1**	**60.0**	**365**	**-37.3**	**22.7**
Inverter	**65.4**	**3**	**70.2**	**365**	**-31.2**	**38.9**
Transformer	**60.0**	**1**	**60.0**	**645**	**-42.2**	**17.8**
Inverter	**65.4**	**3**	**70.2**	**645**	**-36.2**	**34.0**
Tracker Motors	**39.0**	**1**	**39.0**	**140**	**-2.9**	**36.1**
Cumulative Noise Level @ Property Line (dBA)						**41.6**

[1] Noise data provided as an attachment to this report

2.2.2 Panel Washing Operational Noise Levels On-site

Panel Washing Operational Noise Levels On-site

Periodic washing of the solar panels would be achieved using the truck or trailer mounted Wash Station equipped with a small 4-6 HP motor. Panel washing is anticipated to occur approximately four times per year and would take approximately 4 weeks to complete. Washing of the photovoltaic panels/arrays would generally occur during the daytime hours of 7am -10pm. During

panel/array washing times, the project power system would still be operational (i.e., inverters and transformers operating). Therefore, the panel washing activity is addressed cumulatively with other operational noise sources. Section 36.404 of the Noise Ordinance sets a most restrictive operational exterior noise limit for the noise sensitive land uses of 50 dBA Leq for daytime hours of 7 a.m. to 10 p.m. Therefore the most restrictive 50 dBA Leq standard was applied at the property lines.

Noise exposure from the proposed operation of the solar panel wash station was found to have a reference maximum sound power level of 99 dB at 9 feet. This would equate to a sound pressure level of 67 dBA at 9 feet (Source: Honda Engines, 2011). To reduce the noise level of 67 dBA to the County's most restrictive 50 dBA threshold the wash station would need to be located 65 feet from the nearest property line. At a distance of 65 feet, the panel washing would result in and property line noise level of 49.8 dBA. Cumulatively, the panel washing noise level combined with the transformer and inverter noise levels (as shown in Table 2-2 above) would result in and overall cumulative noise level of 50.4 dBA. Since the panel washing equipment will be moving farther away from the property line and washing is conducted no impacts are anticipated and no mitigation measures are required.

2.3 Conclusions

Based on the empirical data, the manufacturers specifications and the distances to the property lines the unshielded cumulative noise levels from the proposed transformers/inverters and tracker motors were found to be below the most restrictive nighttime property line standard of 45 dBA at the adjacent properties zoned A-70. No impacts are anticipated and no mitigation is required.

Panel washing is anticipated to occur approximately four times per year and would take approximately 4 weeks to complete. Washing of the photovoltaic panels/arrays would generally occur during the daytime hours of 7am - 10pm. To reduce the noise level below the County's most restrictive 50 dBA threshold, the wash station would need to be located 65 feet from the nearest property line. No direct or cumulative no impacts are anticipated and no mitigation measures are required.

3.0 CONSTRUCTION ACTIVITIES

3.1 Guidelines for the Determination of Significance

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Sections as follows.

SEC. 36.408: HOURS OF OPERATION OF CONSTRUCTION EQUIPMENT

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

a. Between 7 p.m. and 7 a.m.

b. On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

SEC. 36.409: SOUND LEVEL LIMITATIONS ON CONSTRUCTION EQUIPMENT

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

SEC. 36.410: SOUND LEVEL LIMITATIONS ON IMPULSIVE NOISE

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410A (provided below), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A are as described in the County Zoning Ordinance.

TABLE 36.410A: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410B, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410B are as described in the County Zoning Ordinance.

TABLE 36.410B: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA) FOR PUBLIC ROAD PROJECTS

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(c) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

3.2 Potential Construction Noise Impacts

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts and limited grading will be necessary for this project. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment at a distance of 50 feet can range from 60 dBA for a small tractor up to 100 dBA for rock breakers. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 87 dBA measured at 50 feet from the noise source would be reduced to 81 dBA at 100 feet from the source and be further reduced to 75 dBA at 200 feet from the source.

Using a point-source noise prediction model, calculations of the expected construction noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers. To determine the worst-case noise levels for the grading operations no topographic attenuation, duty-cycle reductions or barrier reductions were utilized. According to the project applicant, the project site will be grubbed to remove vegetation and compacted in one phase followed by the installation of the PV panels in one phase. The grading and subsequent installation of the PV panels is discussed separately below.

The clearing operation may utilize a total of up to two loaders/backhoes, a dozer, a grader and a single water truck. This is more construction equipment than is anticipated to be needed during site preparation and installation. This list was analyzed to be overly conservative and provide a worse case assessment. The noise levels utilized in this analysis are based upon the conservative list of equipment as shown in Table 3-1 below. Most of the construction activities will consist of clearing and grubbing the site for the preparation of the PV panels. The equipment is anticipated to be spread out over the entire site with some equipment potentially operating at or near the property line while the rest of the equipment may be located more than 600 feet from the same property line. This would result in an acoustical center for the grading operation at approximately 300 feet from the nearest property line.

As can be seen in Table 3-1, if all the equipment was operating in the same location, which is not physically possible, at a distance as close as 100 feet from the nearest property line the point source noise attenuation from construction activities is -6.0 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 74.3 dBA at the property line. Given this and the spatial separation of the equipment, the noise levels will comply with the County of San Diego's 75 dBA standard at all Project property lines. The project will not be conducting any offsite construction, all improvements are located within the site and adjacent right of way.

Table 3-1: Site Preparation Noise Levels

Construction Equipment	Quantity	Duty Cycle (Hours/Day)	Source Level @ 50-Feet (dBA)	Cumulative Noise Level @ 50-Feet (dBA Leq-8h)
Grader	1	8	74	74.0
Water Truck	1	8	70	70.0
Dozer	1	8	75	75.0
Loader/Tractor	2	8	73	76.0
			Cumulative Levels @ 50 Feet (dBA)	80.3
			Distance To Property Line	100
			Noise Reduction Due To Distance	-6.0
			NEAREST PROPERTY LINE NOISE LEVEL	74.3

The installation of the PV panels will utilize a total of two small pile drivers to install the panel stands, two mobile cranes to move the PV panel in position and two pneumatic tools to secure the panels to the stands. The noise levels utilized in this analysis based upon the anticipated list of equipment are shown in Table 3-2. Based upon normal installation procedures the equipment is anticipated to be spread out over the entire site with pile driving occurring first and then the installation of the PV panels with a crane and pneumatic tool. Some equipment may be operating at a distance of 70-120 feet from the property line while the rest of the equipment may be located over 600 feet from the other equipment and same property line. This would result in an acoustical center from the installation operations of at least 300 feet to the nearest property line around the perimeter of the site. The distance to the property lines would increase as the interior panels are installed and the noise levels would decrease due to distance.

Table 3-2: PV Panel Installation Noise Levels

Construction Equipment	Quantity	Duty Cycle (Hours/Day)	Source Level @ 50-Feet (dBA)	Cumulative Noise Level @ 50-Feet (dBA Leq-8h)
Pneumatic Tool	2	8	82	85.0
Mobile Crane	2	8	78	81.0
Pile Driver	2	8	84	87.0
			Cumulative Levels @ 50 Feet (dBA)	89.8
			Distance To Property Line	275
			Noise Reduction Due To Distance	-14.8
			NEAREST PROPERTY LINE NOISE LEVEL	74.9

As can be seen in Table 3-2, if all the equipment was operating in the same location, which is not physically possible, at a distance as close as 275 feet from the nearest property line the point source noise attenuation from construction activities is -14.8 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 74.9 dBA at the property line. Given this and the spatial separation of the equipment, the noise levels will comply with the County of San Diego's 75 dBA standard at all Project property lines.

Additionally, the County Noise Ordinance Section 36.410, states that except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown of 82 dBA (at residential uses), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. The maximum sound level and uses are shown above in Table 36.410A as described in the County Zoning Ordinance.

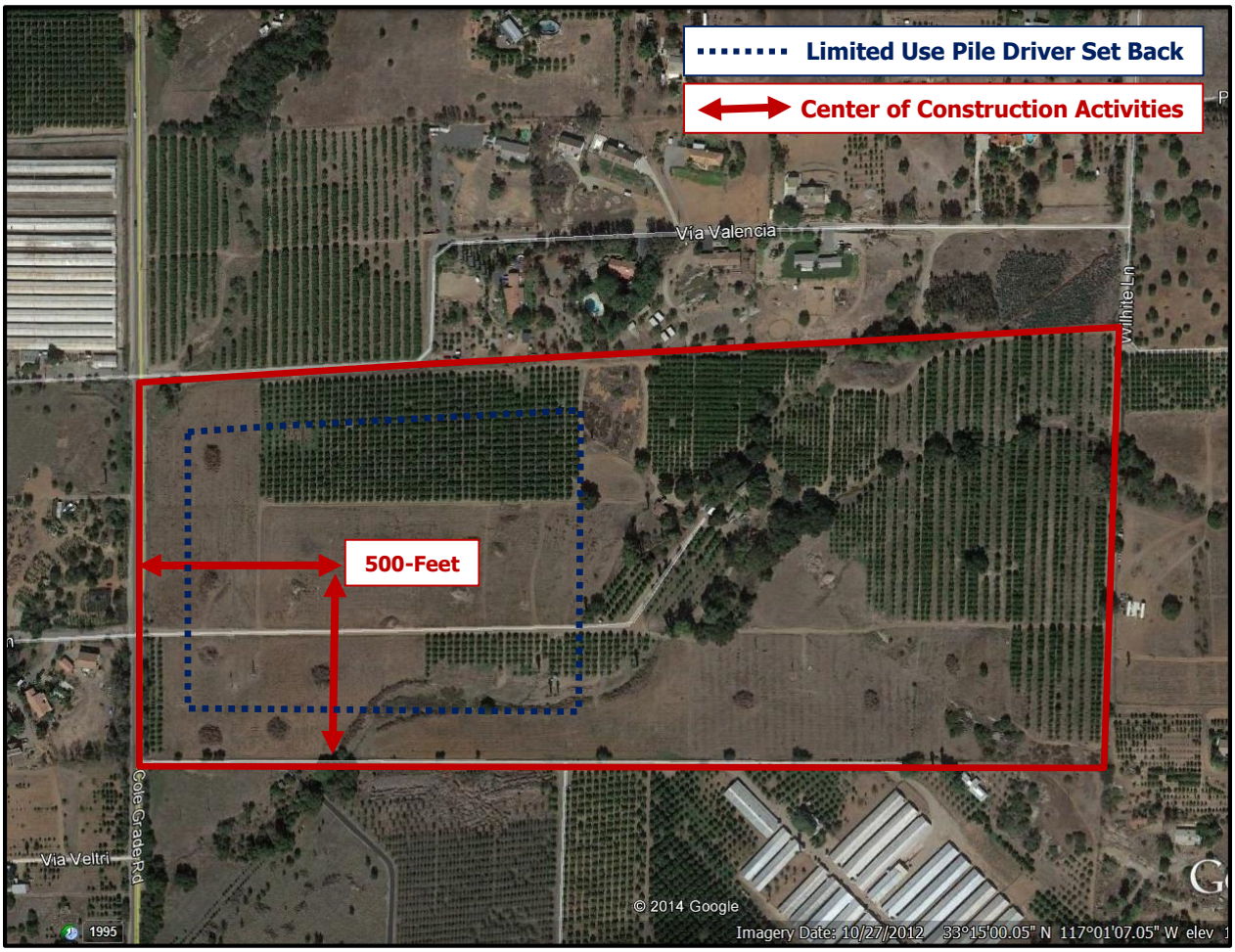
The installation of the PV panels will utilize a total of two small pile drivers to install the panel stands that could produce impulsive noise. Based upon normal installation procedures the two pile drivers are anticipated to be separated on the site. A single pile driver would be operating at a distance of 50 feet from the property line for a short time to install a single panel stand. The pile driver would then move further from the property line to set another panel stand and continue is this fashion. Each panel stand installation process is only anticipated to last 5 minutes or less.

Pile drivers can produce maximum noise levels (Lmax) of 95 dBA at a distance of 50 feet when the drive head is operating (Source: Central Artery/Tunnel (CA/T) project in Boston, Massachusetts). Typically, a pile drive is not continuously operating at full power; this is referred to as the usage factor. The usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power. Based on empirical data collected CA/T project which was used to develop the Road Construction Noise Model (RCNM), a pile driver has a usage factor of 20%. Since the maximum noise level from a pile driver exceeds the County's maximum noise level threshold of 82 dBA the following recommendations are presented.

As a noise design measure, to reduce the maximum noise level of 95 dBA to 82 dBA the pile driver would need to be located 215 feet from the nearest occupied residential property line or only operate 25% of the hourly or daily duration (15 minutes of any hour and 2 hours of a 8 hour work day) when located within that distance. Based on these duration and distance parameters the impulsive noise levels are anticipated to be below the County's most restrictive 82 dBA threshold and no impacts are anticipated and no mitigation measures are required.

The properties adjacent to the Project all have legal dwelling units and therefore are protected under Sections 36.409 and 36.410. The nearest occupied residential dwelling unit to the Project site is to the north. The distances from the main construction activities and the location of the 215 foot reduced pile driver usage set back can be seen in Figure 3-A below. At the distances shown, the construction related noise levels would be well below the 75 dBA standard of Section 36.409 and the 82 dBA impulsive threshold of Section 36.410.

Figure 3-A: Construction Activities and Setbacks



3.2 Construction Conclusions

At a distance as close as 100 feet the point source noise attenuation from the grading activities and the nearest property line is -6.0 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 74.3 dBA at the property line. During the installation of the PV panels at a distance of 275 feet would result in a noise level of 74.9 dBA. The installation equipment is anticipated to average more than 300 feet from the nearest property line. Given this and the spatial separation of the equipment over the large site area, the noise levels of the grading and PV panel installation are anticipated to comply with the County of San Diego's 75 dBA standard at all Project property lines.

Additionally, the County Noise Ordinance Section 36.410, states that no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown of 82 dBA (at residential uses), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. As a noise design measure , to reduce the maximum noise level of 95 dBA to 82 dBA the pile driver would need to be located 215 feet from the nearest occupied residential property line or only operate 25% of the hourly or daily duration (15 minutes of any hour and 2 hours of a 8 hour work day) when located within that distance. Based on these duration and distance parameters the impulsive noise levels are anticipated to be below the County's most restrictive 82 dBA threshold and no impacts are anticipated and no mitigation measures are required.

4.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS

- Operational Noise Analysis

Based on the empirical data, the manufacturers specifications and the distances to the property lines the unshielded cumulative noise levels from the proposed transformers/inverters and tracker motors were found to be below the most restrictive nighttime property line standard of 45 dBA at the adjacent properties zoned A-70. No impacts are anticipated and no mitigation is required.

Panel washing is anticipated to occur approximately four times per year and would take approximately 4 weeks to complete. Washing of the photovoltaic panels/arrays would generally occur during the daytime hours of 7am-10pm. To reduce the noise level below the County's most restrictive 50 dBA threshold, the wash station would need to be located 65 feet from the nearest property line. No direct or cumulative no impacts are anticipated and no mitigation measures are required.

- Construction Noise Analysis

At a distance as close as 100 feet the point source noise attenuation from the grading activities and the nearest property line is -6.0 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 74.3 dBA at the property line. During the installation of the PV panels at a distance of 275 feet would result in a noise level of 74.9 dBA. The installation equipment is anticipated to average more than 300 feet from the nearest property line. Given this and the spatial separation of the equipment over the large site area, the noise levels of the grading and PV panel installation are anticipated to comply with the County of San Diego's 75 dBA standard at all Project property lines.

Additionally, the County Noise Ordinance Section 36.410, states that no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown of 82 dBA (at residential uses), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. As a noise design measure , to reduce the maximum noise level of 95 dBA to 82 dBA the pile driver would need to be located 215 feet from the nearest occupied residential property line or only operate 25% of the hourly or daily duration (15 minutes of any hour and 2 hours of a 8 hour work day) when located within that distance. Based on these duration and distance parameters the impulsive noise levels are anticipated to be below the County's most restrictive 82 dBA threshold and no impacts are anticipated and no mitigation measures are required.

5.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the existing and future acoustical environment and impacts within the proposed NLP Valley Center Solar Project. The report was prepared by Jeremy Louden; a County approved CEQA Consultant for Acoustics.

Jeremy Louden, Principal
Ldn Consulting, Inc.
760-473-1253
jlouden@ldnconsulting.net

Date August 14, 2015

ATTACHMENT A

NOISE SPECIFICATIONS AND NOISE DATA
(Transformers, Tracker Motors and Inverters)

NEMA Standards Publication No. TR 1-1993 (R2000)

Transformers, Regulators and Reactors

Published by:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209

TABLE OF CONTENTS

FOREWORD

The standards appearing in this publication have been developed by the Transformer Section and have been approved for publication by the National Electrical Manufacturers Association. They are used by the electrical industry to promote production economies and to assist users in the proper selection of transformers.

The Transformer Section is working actively with the American National Standards Committee, C57, on Transformers, Regulators and Reactors, in the development, correlation and maintenance of national standards for transformers. This Committee operates under the procedures of the American National Standards Institute (ANSI).

It is the policy of the NEMA Transformer Section to remove material from the NEMA Standards Publication as it is adopted and published in the American National Standard C57 series. The NEMA Standards Publication for Transformers, Regulators and Reactors references these and other American National Standards applying to transformers, and is intended to supplement, without duplication, the American National Standards.

The NEMA Standards Publication for Transformers, Regulators and Reactors contains provision for the following:

a. American National Standards adopted by reference and applicable exceptions approved by NEMA, if any.
b. NEMA Official Standards Proposals. These are official drafts of proposed standards developed within NEMA or in cooperation with other interested organizations, for consideration by ANSI. They have a maximum life of five years, during which time they may be approved as American National Standards or adopted as NEMA Standards, or rescinded.
c. Manufacturing Standards. These are NEMA Standards which are primarily of interest to the manufacturers of transformers and which are not yet included in an American National Standard.
d. Standards Which Are Controversial. These are NEMA Standards, on which there is a difference of opinion within Committee C57. The NEMA version will be included in the NEMA Standards Publication until such time as the differences between ANSI and NEMA are resolved.

NEMA Standards Publications are subject to periodic review and take into consideration user input. They are being revised constantly to meet changing economic conditions and technical progress. Users should secure latest editions. Proposed or recommended revisions should be submitted to:

Vice President, Engineering Department
National Electrical Manufacturers Association
2101 L Street, N.W.
Washington, D.C. 20037-1526

SCOPE

This publication provides a list of all ANSI C57 Standards that have been approved by NEMA. In addition it includes certain NEMA Standard test methods, test codes, properties, etc., of liquid-immersed transformers, regulators, and reactors that are not American National Standards.

PART 0
GENERAL

The following American National Standards have been approved as NEMA Standards and should be inserted in this Part 0:

ANSI/IEEE C57.12.00-1988	*General Requirements for Liquid-Immersed Distribution, Power and Regulating Transformers*
ANSI/IEEE C57.12.01-1989	*General Requirements for Dry Type Power and Distribution Transformers*
ANSI C57.12.10-1988	*Requirements for Transformers 230,000 volts and below, 833/958-8333/10,417 kVA single-phase 750/862-60,000/80,000/100,000 kVA three phase, including supplements*
ANSI C57.12.70-1993	*Terminal Markings and Connections for Distribution and Power Transformers*
ANSI/IEEE C57.12.90-1993	*Test Code for Liquid-immersed Distribution, Power & Regulating Transformers and Guide for Short-Circuit Testing of Distribution & Power Transformers*
ANSI/IEEE C57.19.00-1992	*General Requirements and Test Procedure for Outdoor Apparatus Bushings*
ANSI/IEEE C57.19.01-1992	*Standard Performance Characteristics & Dimensions for Outdoor Apparatus Bushings*
ANSI/IEEE C57.92-1992	*Guide for Loading Mineral-oil-immersed Power Transformers up to and including 100 MVA with 55C or 65C Average Winding Rise*

The NEMA Standards TR 1-0.01 through TR 1-0.09 on the following pages (see Part 0 Pages 1–9) also apply generally to transformers.

0.01 PREFERRED VOLTAGE RATINGS

Preferred system voltages and corresponding transformer voltage ratings are given in the American National Standard for Electric Power Systems and Equipment--Voltage Ratings (60 Hz), C84.1-1989. It is recommended that these ratings be used as a guide in the purchase and operation of transformers.

0.02 FORCED-AIR (FA) AND FORCED-OIL (FOA) RATINGS

Under the conditions of par. 5.11 of American National Standard ANSI/IEEE C57.12.00-1988, the relationship between self-cooled ratings and forced-air-cooled or forced-oil-cooled ratings shall be in accordance with Table 0-1.

Table 0-1
FORCED-AIR AND FORCED-OIL RATINGS RELATIONSHIPS

	Self-cooled Ratings* (kVA)		Percent of Self-Cooled Ratings With Auxiliary Cooling	
Class	Single Phase	Three Phase	First Stage	Second Stage
OA/FA	501-2499	501-2499	115	--
OA/FA	2500-9999	2500-11999	125	--
OA/FA	10000 and above	12000 and above	133-1/3	--
OA/FA/FA	10000 and above	12000 and above	133-1/3	166-2/3
OA/FA/FOA	10000 and above	12000 and above	133-1/3	166-2/3
OA/FOA/FOA	10000 and above	12000 and above	133-1/3	166-2/3

*In the case of multi-winding transformers or autotransformers, the ratings given are the equivalent two-winding ratings.

PERFORMANCE

0.03 RADIO INFLUENCE VOLTAGE LEVELS

The following values apply to liquid-filled transformers. They do not apply to load tap changing during switching or to operation of auxiliary relays and control switches.

0.03.1 Distribution Transformers

Radio influence voltage levels for distribution transformers, for systems rated 69 kV and less, shall not exceed 100 microvolts when measured in accordance with Section 7.01. The test voltage shall be the line-to-neutral voltage corresponding to 110 percent excitation of the transformer. This will be the coil voltage for wye connections and 1/3 times the coil voltage for delta connections.

0.04 POWER FACTOR OF INSULATION OF OIL-IMMERSED TRANSFORMERS

While the real significance which can be attached to the power factor of oil-immersed transformers is still a matter of opinion, experience has shown that power factor is helpful in assessing the probable conditions of the insulation when good judgement is used.

The proper interpretation of power factor of oil-immersed transformers is being given careful attention by manufacturers in connection with the problems of (1) selecting insulating materials, (2) sealing, and (3) processing the transformers. However, it is the comparative values which are guides for the successful solution for these problems rather than an absolute value of power factor.

The generally accepted factory tests for proving the insulation level are the prescribed low-frequency tests and impulse tests given in the American National Standard C57.12.90-1993.

When required, a factory power-factor test can be made, and this measurement will be of value for comparison with field power-factor measurements to assess the probable condition of the insulation. It is not feasible to establish standard power-factor values for oil-immersed transformers because:

a. Experience has definitely proved that little or no relation exists between power factor and the ability of the transformer to withstand the prescribed dielectric tests.
b. Experience has definitely proved that the variation in power factor with temperature is substantial and erratic so that no single correction curve will fit all cases.

When a factory power-factor measurement of a transformer is required, the measurement should be made with the insulation at room temperature, preferably at or close to 20°C.

0.05 AUDIBLE SOUND LEVELS

Transformers shall be so designed that the average sound level will not exceed the values given in Tables 0-2 through 0-4 when measured at the factory in accordance with the conditions outlined in ANSI/IEEE C57.12.90-1993.

The guaranteed sound levels should continue to be per Tables 0-2 through 0-4 until such time as enough data on measured noise power levels becomes available.

Sound pressure levels are established and published in this document. Sound power may be calculated from sound pressure, using the method described in C57.12.90-1993.

Rectifier, railway, furnace, grounding, mobile and mobile unit substation transformers are not covered by the tables. The tables do not apply during the time that power switches are operating in load-tap-changing transformers and in transformers with integral power switches.

ble 0-2
AUDIBLE SOUND LEVELS F .-IMMERSED POWER TRANSFORMERS

nn 1 - Class*OA, Ow and FOW Ratings
nn 2 - Class* FA and FOA First stage Auxiliary Cooling**†
nn 3 - Straight FOA* Ratings, FA* FOA* Second-stage Auxiliary Cooling*†

erage Sound vel ††, cibels	Equivalent Two-winding Rating▲																	
	350 kV BIL and Below			450, 550, 650 kV BIL			750 and 825 kV BIL			900 and 1050 kV BIL			1175 kV BIL			1300 kV BIL and Above		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	700	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
	1000	.	. .	...	..	..	...	...	...	...	...	...	...	...	...	...	...	...
	..	. .	...	700	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1500	. .	..	1000	...	...	. .	..	...	...	...	...	...	...	...	...	...	...
	2000	.	. .	...	...	.	...	...	..	...	...	...	...	...	...	...	...	...
	2500	...	...	1500	...	.	.	..	..	..	...	...	...	..	..	...	...	...
	3000	...	...	2000	...	..	. .	...	...	...	...	. .	...	..	...	...	...	...
	4000	...	...	2500	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	5000	...	...	3000	...	...	...	...	...	...	...	...	...	..	...	...	...	...
	6000	...	...	4000	.	.	3000	...	...	...	...	...	...	...	...	...	...	...
	7500	6250▲▲	..	5000	3750▲▲	..	4000	3125▲▲	..	..	...	. .	...	..	...	...	...	...
	10000	7500		6000	5000	.	5000	3750	...	. .	...	. .	...	..	...	...	...	...
	12500	9375	.	7500	6250	..	6000	5000	...	...	...	...	...	...	...	...	...	...
	15000	12500	.	10000	7500	..	7500	6250	. .	...	...	...	..	. .	...	...	...	...
	20000	16667		12500	9375		10000	7500	...	...	...	...	...	...	...	...	...	...
	25000	20000	20800	15000	12500	..	12500	9375	...	...	...	...	...	..	...	...	...	...
	30000	26667	25000	20000	16667	...	15000	12500	...	12500	...	. .	...	...	..	...	...	...
	40000	33333	33333	25000	20000	20800	20000	16667	...	15000	...	...	12500	...	...	...	...	...
	50000	40000	41667	30000	26667	25000	25000	20000	20800	20000	16667	...	15000	...	...	12500	...	...
	60000	53333	50000	40000	33333	33333	30000	26667	25000	25000	20000	20800	20000	16667	..	15000	...	...
	80000	66667	66667	50000	40000	41667	40000	33333	33333	30000	26667	25000	25000	20000	20800	20000	16667	...
	100000	80000	83333	60000	53333	50000	50000	40000	41667	40000	33333	33333	30000	26667	25000	25000	20000	20800
	...	106667	100000	80000	66667	66667	60000	53333	50000	50000	40000	41667	40000	33333	33333	30000	26667	25000
	..	133333	133333	100000	80000	83333	80000	66667	66667	60000	53333	50000	50000	40000	41667	40000	33333	33333
	...	...	166667	...	106667	100000	100000	80000	83333	80000	66667	66667	60000	53333	50000	50000	40000	41667
	...	...	200000	...	133333	133333	...	106667	100000	100000	80000	83333	80000	66667	66667	60000	53333	50000
	..	...	250000	...	...	166667	...	133333	133333	...	106667	100000	100000	80000	83333	80000	66667	66667
	..	...	300000	...	...	200000	...	...	166667	...	133333	133333	...	106667	100000	100000	80000	83333
	..	...	400000	...	...	250000	...	...	200000	...	...	166667	...	133333	133333	...	106667	100000
	...	...	...	...	...	300000	...	...	250000	...	...	200000	...	...	166667	...	133333	133333
	...	...	...	...	...	400000	...	...	300000	...	...	250000	...	...	200000	...	...	166667
	...	...	...	...	...	...	...	...	400000	...	...	300000	...	...	250000	...	...	200000
	...	...	...	...	...	...	...	...	...	...	...	400000	...	...	300000	...	...	250000
	...	...	...	...	...	..	...	...	...	...	...	...	...	...	400000	...	...	300000
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	400000

Classes of cooling (see 2.6.1 of American National Standard C57.12.00-1988.
First- and second-stage auxiliary cooling (see TR 1.0.02).
For column 2 and 3 ratings, the sound levels are with the auxiliary cooling equipment in operation.
†For intermediate kVA ratings, use the average sound level of the next larger kVA rating.
The equivalent two-winding 55°C or 65°C rating is defined as one-half the sum of the kVA rating of all windings.
▲Sixty-seven decibels for all kVA ratings equal to this or smaller.

Table 0-3
AUDIBLE SOUND LEVELS FOR LIQUID-IMMERSED DISTRIBUTION TRANSFORMERS AND NETWORK TRANSFORMERS

Equivalent Two-winding kVA	Average Sound Level, Decibels
0–50	48
51–100	51
101–300	55
301–500	56
750	57
1000	58
1500	60
2000	61
2500	62

Small Transformer

Table 0-4
AUDIBLE SOUND LEVELS FOR DRY-TYPE TRANSFORMERS 15000-VOLT NOMINAL SYSTEM VOLTAGE AND BELOW

Equivalent Two-Winding kVA	Average Sound Level, Decibels		Equivalent Two-winding kVA	Average Sound Level, Decibels Ventilated Forced Air Cooled **,†
	Self-cooled Ventilated*	Self-cooled Sealed*		
0–50	50	50	...	...
51–150	55	55	...	...
151–300	58	57	3–300	67
301–500	60	59	301–500	67
501–700	62	61	501–833	67
701–1000	64	63	834–1167	67
1001–1500	65	64	1168–1667	68
1501–2000	66	65	1668–2000	69
2001–3000	68	66	2001–3333	71
3001–4000	70	68	3334–5000	73
4001–5000	71	69	5001–6667	74
5001–6000	72	70	6668–8333	75
6001–7500	73	71	8334–10000	76

* Class AA rating

**Does not apply to sealed-type transformers

†Class FA and AFA ratings

Advanced Energy Industries Inc.
Corporate Compliance Department

Solaron 500K

Acoustic Emissions / Noise

Model tested:
3159500-001
SOLARON 500KW, 480V OUTPUT
Serial Number:ENG1

Test Date(s):
11/21/2008

Test Configuration:
Full power operation

Auxiliary Equipment used:
None

Line Voltage(s):
~480V 3P+PE; WYE

Environmental Conditions:
Temperature 23 ºC ± 10
Humidity 50% ± 30%

Line Frequency Tested:
☐ *50 Hz*
☑ *60 Hz*

Reference Standards:
IEC/EN 61010-1

Load Condition(s):
No load

Known Similar Models:
3159500-xxxx

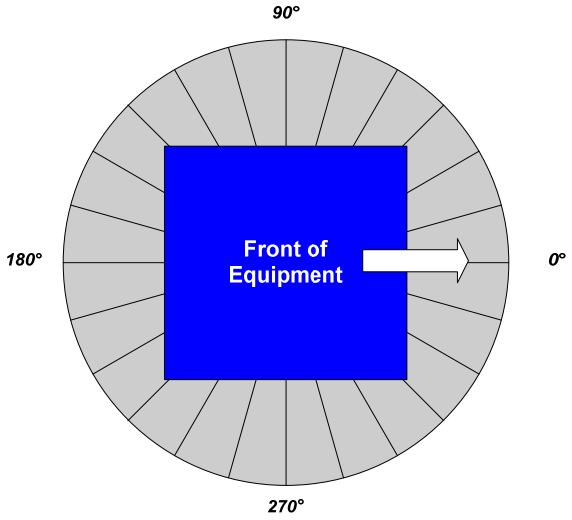
This letter and attached documentation certify that the Solaron 500 Inverter has been tested and was found to comply with the requirements of EN 50178 Section A.4.7 Acoustic Noise. This certificate remains valid, contingent on proper installation, operation, and adherence to conditions of use outlined in the User Manual.

3159500-001

TEST SETUP:

1) The product was placed on the floor and away from reflective walls.
2) After determining which angle from the product provides the maximum noise level, the following measurements were made from the front of the product and the angle of maximum noise level:

- Ambient Noise.
- 1 meter from the product
- 3 meters from the product



RESULTS:
The ambient noise measurement was 64.0 dB(A).

		Operating Mode			
Measurement Angle	Distance	#1	#2	#3	#4
0 º (front)	1 meters	70.6 dB(A)	-	-	-
180º (back)	1 meters	70.0 dB(A)	-	-	-
0 º (front)	3 meters	65.4 dB(A)	-	-	-
180º (back)	3 meters	65.1 dB(A)	-	-	-

Operating Modes:	
1.	Full Power.
2.	-
3.	-
4.	-

Test Equipment:	**Calibration Due**
Simpson 897 Dosimeter, SN B003121	March/2009
Simpson 887-2 Sound level Calibrator, SN AE-1495	March/2009

Doug Powell — Tested by

November 21, 2008 — Date

13 September 2010

8minutenergy Renewables LLC
142 S. Hayworth Ave
Los Angeles, CA 90048

Attention: Mr. Tom Buttgenbach, President

Subject: Nellis Solar Power Plant
Acoustical Measurements
JBA Project No. 10.0369.Z

Dear Mr. Buttgenbach:

We visited the Nellis Solar Power Plant today. Due to security, we were no able to record acoustical measurements within the facility, but were able to record measurements from just outside the North gate, which is approximately 100' from the nearest solar panel tracker.

We measured a sound level of 39dBA with a number of SunPower trackers moving. This level includes the sound of the trackers and other uncontrollable background noises such as aircraft, vehicular traffic, birds chirping and an adjacent rendering facility. As the total noise level is less than 45dBA we know that the noise due to the trackers alone will be less than 45dBA at 100' distance.

Based on this measurement we can state that the noise level associated with trackers such as the SunPower or similarly actuated trackers will be less than the 45dBA at a distance of 100' or more.

Sincerely,

JBA CONSULTING ENGINEERS

Michael A. Schwob, PE, INCE
Director of Technology Services,
Senior Acoustical Engineer

MAS\hb