5.8 Noise

This section addresses the potential noise impacts associated with construction and operation of the BSEP. It covers both the power generating facilities and its linear facilities and includes an evaluation of potential effects on noise-sensitive receptors in the BSEP plant site vicinity, as well as on BSEP personnel. As required by CEC guidelines, a 25-hour noise survey was conducted to establish background noise levels in the Project area.

5.8.1 LORS Compliance

The construction and operation of the BSEP will be performed in accordance with the applicable LORS. The applicable Federal, State, and local noise LORS are summarized in Table 5.8.1 and are discussed in the text that follows the table.

Table 5.8-1 LORS Applicable to Noise

LORS	Applicability	Where Discussed in AFC
Federal:		
Federal Noise Control Act of 1972 (40 CFR 204)	Regulates noise emissions from operation of construction equipment and facilities; establishes noise emission standards for construction equipment and other categories of equipment; and provides standards for the testing, inspection, and monitoring of such equipment. Gives states and municipalities primary responsibility for noise control.	Section 5.8.3
Occupational Health and Safety Act of 1970 (OSHA) (29 Code of Federal Regulations [CFR] 1910.95)	Regulates the worker noise exposure to 90 dBA over an 8-hour work shift. Areas above 85 dBA need to be posted as high noise level areas and hearing protection will be required.	Section 5.8.3
State:		
California Noise Control Act of 1973 (Health and Safety Code, Division 28)	Declares that excessive noise is a serious hazard to public health and welfare; establishes the Office of Noise Control with responsibility to set standards for noise exposure in cooperation with local governments or the State Legislature.	Section 5.8.3
California Government Code 65300	Establishes guidelines for the development of noise elements to City and County General Plans.	Section 5.8.3
Cal-OSHA, 8 CCR Article 105, Sections 095 et seq.	Exposure of workers over 8-hour shift is limited to 90 dBA. See Federal OSHA.	Section 5.8.3

LORS	Applicability	Where Discussed in AFC
California Vehicle Code, Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	Section 5.8.3
Local:		
Kern County General Plan Noise Element	The General Plan establishes goals and policies to ensure that County residents are protected from excessive noise. The County requires commercial and industrial uses to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB Ldn and interior noise levels in excess of 45 dB Ldn.	Sections 5.8.2 and 5.8.3

5.8.1.1 Federal LORS

In terms of LORS compliance, the Federal regulations that are applicable to the BSEP have been incorporated into local and state regulatory requirements. The EPA noise guidelines have been considered in developing local requirements.

Under the Occupational Safety and Health Act of 1970, the Occupational Safety and Health Administration (OSHA) has adopted regulations that are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which a worker is exposed. OSHA regulations also dictate hearing conservation program requirements and workspace noise monitoring requirements. OSHA requirements limit worker noise exposure to 90 decibels absolute (dBA) over an eight-hour work shift. Furthermore, if eight-hour worker noise exposure exceeds 85 dBA, the area must be posted as a noise hazard zone and a hearing conservation program is required.

5.8.1.2 State LORS

The occupational noise regulations promulgated under OSHA are administered by the California Occupational Safety and Health Administration (Cal-OSHA). The noise exposure level of workers is regulated at 90 dBA over an 8-hour shift to protect hearing (29 CFR 1910.95). Onsite noise levels will generally be in the 70 dBA to 85 dBA range. Onsite Project areas above 85dBA will be posted as high noise level areas and hearing protection will be required. The Project will implement a hearing protection program for applicable employees and maintain 8-hour exposure levels below 90 dBA.

Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff's Office. Delivery trucks and other Project-related vehicles will meet applicable Code requirements.

5.8.1.3 Local LORS

The applicable State noise guidelines are adopted in the local general plans and ordinances. The BSEP site is within Kern County and thus, the Kern County General Plan Noise Element and the Ordinance Code of Kern County would represent the local LORS.

The Kern County General Plan establishes goals and policies to ensure that Kern County residents are protected from excessive noise. County policy requires review of discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses. Noise sensitive land uses are defined by the County to include: residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches. The County requires proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB Ldn and interior noise levels in excess of 45 dB Ldn.

The Ordinance Code of Kern County does not contain specific regulations regarding industrial noise, with the exception of Chapter 19.64 which specifies noise standards for wind energy facilities. Chapter 8.36 Noise Control is restricted to prohibited sounds generated by people (e.g., public address systems). Thus, there are no local noise ordinance regulations applicable to the Project.

5.8.1.4 Involved Agencies

No permits are required for the BSEP that are specific to noise issues. However, the Project will need to comply with the applicable requirements of the Kern County General Plan Noise Element. The contact information for the Kern County Planning Department is provided in Table 5.8-2.

Table 5.8-2 Agencies and Agency Contacts

Agency Contact	Phone/E-mail	Permit/Issue
Lorelei Oviatt Special Projects Division Chief Kern County Planning Department 2700 “M” Street, Suite 100 Bakersfield, CA 93301	(661) 862-8600 loreleio@co.kern.ca.us	Compliance with County General Plan Noise Element

5.8.1.5 Required Permits and Permit Schedule

The BSEP does not require permits that are specific to noise issues, and thus, there is no permit schedule.

5.8.2 Affected Environment

The following sections provide background information on noise characteristics and describe the existing noise environment in the Project vicinity.

5.8.2.1 General Noise Characteristics

The unit of sound measurement is the decibel (dB). The dB scale is a logarithmic measure used to quantify sound power or sound pressure. A sound power level describes the acoustical energy of a sound and is independent of the medium in which the sound is traveling. As such, sound power levels are not measurable with a sound level meter, which only measures sound pressure levels. A sound pressure level is a physical measure of the pressure field a sound wave produces, and is presented in dB as the ratio of a measured pressure to a reference pressure.

Noise Effects on Humans

The human ear is not uniformly sensitive to all noise frequencies. Therefore, the "A" weighting scale was devised to correspond with the ear's sensitivity. The A-weighting scale uses specific weighting of sound pressure levels from about 31.5 Hz to 8 kilohertz (kHz) for the purpose of determining the human response to sound. The resulting unit of measure is the A-weighted decibel (dBA). Because noise levels can vary over a given time period, they are quantified further using the Equivalent Sound Level (Leq) and Day-Night Sound Level (Ldn). The Leq is an average of the time-varying sound energy for a specified time period. The Ldn is an average of the time-varying sound energy for one 24-hour period, with a 10 decibel (dB) addition to the sound energy for the time period of 22:00 to 07:00 hours (10 PM to 7 AM). Additional technical noise terms and their definitions are provided in Table 5.8-3.

The effects of noise on people can be listed in three general categories: 1) subjective effects of annoyance, nuisance, and dissatisfaction; 2) interference with activities such as speech, sleep, and learning; and 3) physiological effects such as startling and hearing loss. In most cases, environmental noise may produce effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individually thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" noise environment to which that person has adapted. In general, the more the level or tonal variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 65 dBA range, and high above 65 dBA. Typical Ldn values might be 35 dBA for a desert wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown, and 80 to 85 dBA near a freeway or airport.

Noise Propagation

In air, sound from a point source radiates according to inverse square laws either spherically or hemispherically from the source, depending on whether the noise source is near a reflecting surface such as the ground. Consequently, sound will decrease at a rate of 6 dB per doubling of distance from a point source. Additional decreases will occur due to sound absorption in the air, interaction with the ground, and shielding by intervening obstacles.

5.8.2.2 Existing Noise Environment

The Project site is located in eastern Kern County at the western edge of the Mojave Desert just east of the extreme southern end of the Sierra Nevada Mountains. The terrain is relatively flat, open, and sparsely populated. Surrounding the proposed site is Cantil, a small unincorporated community to the northeast; the Honda Proving Center automotive test track to the east; the Union Pacific (UP) railroad tracks that run approximately southeast-northwest east slightly to the west of the BSEP plant site; and SR-14 that runs approximately southwest-northeast to the west of the railroad tracks. Red Rock Canyon State Park is located about four miles to the north of the site and the northern border of California City is located about four miles to the south.

Table 5.8-3 Definition of Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	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 in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
L(10), L(50), & L(90)	The A-weighted noise levels that are exceeded 10 percent, 50 percent, and 90 percent of the time, respectively, during the measurements period. L(90) is generally taken as the background noise level.
Equivalent Noise Level, Leq	The energy average A-weighted noise level during a noise level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to the sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite noise from all sources, near and far. The normal or existing level of environmental noise at a given location
Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.
Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Ordinance, California Department of Health Services, 1977.	

The study area for the noise analysis included noise sources and sensitive receptors within approximately one mile from the Project site boundaries and to the edges of the Project's transmission line right of way (ROW). Existing identifiable noise sources in the study area are vehicle noise on SR-14, the Honda Proving Center, and trains using the UP tracks that lie between the site's western boundary and SR-14. Ambient noise levels are louder in the vicinity of SR-14 due to the highway traffic.

Areas within approximately one mile of the Project plant site boundary and to the edges of the ROW of the Project's transmission line route options were evaluated. Noise measurements were not taken in the vicinity

of the Red Rock Elementary School as originally planned, due to the permanent closure of the school three months prior to the measurement period. Identified residential receptors include four scattered residences as shown in Figure 5.8-1 and listed below:

- East Residence located approximately 1,700 feet (0.3 mile) southeast of the point were the plant site's eastern boundary turns west;
- West Residence located on the west side of SR-14 approximately 2,500 feet (0.5 mile) north of the point where the plant site boundary intersects SR-14;
- Southeast Residence located approximately 3,300 feet (0.6 mile) southeast of the plant site's extreme southeast corner; and
- Northeast Residence located at the extreme southwest corner of Cantil, approximately 3,400 feet (0.6 mile) north of the plant site's extreme northeast corner.

Background Sound Level Measurements

The noise measurement sites were chosen to characterize the acoustical environment of the noise-sensitive receptors closest to the Project site. A noise-sensitive receptor is considered to be a location such as a residence, church, school, or open recreational area, where activities exist that would be subject to interference or annoyance from external noise sources.

Methodology. A-weighted sound levels were measured in accordance with ANSI S1.13 at approximately five feet above grade using two ANSI S1.4 Type 1 portable real-time sound level meters. In order to minimize extraneous weather-related noise, the sound level meter microphone was equipped with a windscreen, and measurements were conducted only during periods having wind speed peaks less than 13 mph and during dry weather conditions.

To assure accuracy of the measurements, field calibration checks of the sound level meter were conducted using a certified sound calibrator before the start and at the end of each measurement period. Additionally, the sound level meter and filter set was factory calibrated within 12 months preceding the measurements.

Atmospheric conditions during the background noise measurements conducted at/near the BSEP site on December 3, 2007 through December 4, 2007 are summarized as follows:

- The minimum low temperature for the period was 33 ^{o}F and the maximum high temperature was 59 ^{o}F;
- The minimum and maximum relative humidity measurements were 24 percent and 68 percent, respectively;
- The wind speeds during the measurement period were generally light with a maximum wind speed of six mph that occurred once; calm winds were reported for nine hours of the 25-hour noise measurement period; and
- As measured at monitoring stations at Palmdale and Victorville, 0.1 inch of precipitation was reported in Palmdale on December 3 for the hour from 11 AM to 12 noon, and 0.1 inch of precipitation was reported in Victorville on December 4 for the hour from 7 AM to 8 AM.

In accordance with ASTM E1014-84, Standard Guide for Measurement of A-Weighted Sound Levels, extraneous weather related noise is minimized by conducting measurements only during periods having wind speeds of less than 12 mph and at times of no measurable precipitation. Using these criteria, weather conditions may have affected (and thus invalidated) the noise measurements for two of the 25 measurement hours, as follows: 1) on December 3 between 11 AM and 12 Noon because of measurable precipitation, and 2) on December 4 between 7 AM and 8 AM because of measurable precipitation.

Monitoring Duration. Noise monitoring was conducted for a 25-hour period at the property lines closest to the Project site of the East and West Residences. The East and West Residences were selected for long-term noise measurements since they are closer to the noise generating sources in the power block of the BSEP plant site than the Northeast and Southeast Residences. Short-term measurements consisting of three 30-minute periods each were conducted at the property lines closest to the plant site of the Northeast and Southeast Residences.

Monitoring Results. The results of the long-term (25-hours) noise monitoring at the East Residence and the West Residence are presented in Table 5.8-4. The Ldn values calculated from the measured hourly Leq values were 43.3 dBA Ldn at the East Residence and 63.1 dBA Ldn at the West Residence. These ambient Ldn levels are less than the Kern County exterior noise threshold of 65 dBA Ldn for residential land uses. It should be noted that the Ldn value calculated for the West Residence included vehicle traffic noise from SR-14, and train noise from the Union Pacific tracks located approximately 220 and 790 feet, respectively from that site.

Short-term noise measurements consisting of three 30-minute periods each were taken at the Northeast Residence and Southeast Residence and the results are presented in Table 5.8-5.

5.8.3 Environmental Impacts

The following section describes the noise impacts of the BSEP during construction and operation.

5.8.3.1 Significance Criteria

Noise impacts would be considered significant if the combined noise level of ambient plus Project-generated noise at the nearest sensitive receptors would exceed the 65 dB Ldn exterior noise level threshold for residential uses established by the Kern County General Plan Noise Element. Alternatively, if the 65 dB Ldn threshold is not exceeded, a significant noise impact would result if ambient plus Project-generated noise levels at a sensitive receptor constitute a substantial increase above ambient alone levels. An increase above ambient noise levels up to 5 dBA in a residential setting is generally considered insignificant; an increase between 5 and 10 dBA could be considered significant or insignificant by the CEC depending on the particular circumstances; and an increase of 10 dBA is subjectively heard as a doubling in loudness and would almost always be considered significant by the CEC. Factors to be considered in determining the significance of an adverse affect include: the resulting combined noise level of ambient plus Project-generated noise; the duration and frequency of the noise; the number of people affected; and the land use designation of the affected receptor sites.

Table 5.8-4 Long-Term Ambient Noise Measurements (dB(A))– 12/03/07 to 12/04/07

	Location 1: East Residence (0.3 Mile Southeast of Project Site)				Location 2: West Residence (0.5 Mile West of Project Site)			
Hour	**Leq**	**L(10)**	**L(50)**	**L(90)**	**Leq**	**L(10)**	**L(50)**	**L(90)**
16:00	37.9	38.5	33.9	33.1	57.7	60.7	53.4	42.4
17: 00	35.2	37.3	33.8	32.6	58.4	62.2	55.9	41.9
18: 00	36.2	37.9	33.4	32.5	59.8	63.8	52.9	34.7
19: 00	34.8	34.0	33.2	32.5	58.6	62.9	52.4	35.3
20: 00	33.7	34.8	330	32.4	58.9	62.9	49.2	27.4
21: 00	34.1	35.4	33.5	32.6	58.1	62	49.3	28.8
22: 00	34.4	35.4	33.6	32.6	55.3	58.7	43.5	26.5
23: 00	34.1	35.3	33.6	32.5	55.2	58.5	35.2	24.2
00: 00	35.0	36.6	34.5	33.2	56.4	59.4	37.9	25.9
01: 00	35.2	37.0	33.9	32.6	55.9	59.4	37.4	23.2
02: 00	34.4	35.9	33.8	32.6	56.3	57.3	31.4	21.3
03: 00	34.1	35.2	33.7	32.7	57.1	61.0	36.5	25.2
04: 00	35.9	37.8	34.6	33.2	57.2	60.8	36.4	24.1
05: 00	37.0	39.2	36.1	34.5	58.6	62.6	51.9	38.5
06: 00	38.4	40.7	37.5	34.8	58.1	62.4	50.8	37.3
07: 00	40.9	42.9	38.9	36.2	55.8	59.5	51.6	43.8
08: 00	41.7	43.8	39.4	37.2	54.3	57.8	48.8	40.4
09: 00	42.4	420	38.7	36.6	52.8	56.5	46.2	38.1
10: 00	42.6	45.9	37.4	34.9	52.0	55.7	45.9	35.5
11: 00	43.4	44.4	35.8	33.8	52.4	55.9	45.4	34.3
12: 00	43.3	41.3	34.6	33.3	51.2	55.2	44.6	34.5
13: 00	36.3	37.1	34.2	33.5	52.6	56.5	45.2	35.5
14: 00	43.9	40.4	34.2	33.5	54.1	57.7	47.6	35.2
15: 00	44.6	44.5	34.2	33.4	53.1	56.9	48.2	36.6
16: 00	39.0	39.2	34.2	33.2	56.0	60.1	51.1	37.5
Ldn	**43.3**				**63.1**			

Table 5.8-5 Short-Term Ambient Noise Measurements – 12/05/07

Location 3: Northeast Residence (0.6 Mile North of Project Site)					Location 4: Southeast Residence (0.6 Mile Southeast of Project Site)				
Start Times	**Leq**	**L(10)**	**L(50)**	**L(90)**	**Start Times**	**Leq**	**L(10)**	**L(50)**	**L(90)**
9:00	43.2	46.1	38.3	33.5	10:00	48.8	53.0	39.5	34.9
9:30	36.6	36.6	32.4	29.7	10:30	40.6	42.6	35.8	33.9
10:00	53.1	53.9	35.6	28.8	11:00	46.1	40.6	35.9	34.6

5.8.3.2 Construction

Plant Site

Construction will occur over a period of 25 months. Table 5.8-6 provides a list of equipment that may be used during Project construction together with associated noise levels and estimated load factors.

Table 5.8-6 Construction Equipment Noise Emissions

Equipment	HP	Fuel Type	Load Factor (%)	Lmax @ 50 ft
Air Compressor, Ingersoll-Rand	80	Diesel	50	82
Asphalt Paver, Cat A-8008	102	Diesel	60	80
Backhoe	48	Diesel	45	80
Backhoe, Cat, 420E	89	Diesel	50	80
Compactor, Cat CS-563	145	Diesel	60	83
Concrete Pumper	85	Diesel	20	82
Crane, 150-Ton, Manitowoc	250	Diesel	45	85
Crane, 20-Ton, TR400	185	Diesel	45	84
Crane, 225-Ton, Manitowoc, 4100W	350	Diesel	45	86
Crane, 40-Ton, Grove, TR700B	220	Diesel	45	84
Crane, 5 ton	62	Diesel	45	80
Crane, Hydraulic, 150 Ton	250	Diesel	45	85
Crane, Hydraulic, Rough Terrain, 30 Ton	125	Diesel	45	82
Crawler, Track Type, Drill Rig, Pneumatic	305	Diesel	25	85
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	60	84
Digger, Transmission Type, Truck Mount	135	Diesel	50	83
Dozer	200	Diesel	60	84
Drill Rig, Truck Mount	190	Diesel	20	79

Equipment	HP	Fuel Type	Load Factor (%)	Lmax @ 50 ft
Forklift, 10 Ton	85	Diesel	50	80
Grader	110	Diesel	60	84
Grader, Cat 135H	135	Diesel	60	85
Loader, Cat, 938F	140	Diesel	55	80
Pickup Trucks	160	Gas	40	75
Pipelayer, Cat 561N	123	Diesel	40	82
Pneumatic tools	--	--	50	85
Roller, 5 ton	70	Diesel	20	80
Tractor/Loader/Backhoe	80	Diesel	45	80
Trencher, Cat 140G	54	Diesel	70	80
Truck, Concrete Pump, International	190	Diesel	60	82
Truck, Concrete, 10 Yd	310	Diesel	40	80
Truck, Dump	250	Diesel	40	84
Truck, Dump, 10 Ton	235	Diesel	40	80
Truck, Extended Trailer, Tractor	310	Diesel	40	80
Truck, Flatbed	200	Gas	40	74
Truck, Flatbed, 2 Ton	235	Gas	40	74
Truck, Flatbed, 5 Ton	235	Gas	40	74
Truck, Fuel/Lube	200	Gas	40	80
Truck, Semi, Tractor	310	Diesel	40	80
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	40	80
Truck, Watering	250	Diesel	40	84
Truck, Welding	200	Gas	40	80
Trucks, 1-Ton Flat Bed	200	Gas	40	75
Welder	35	Diesel	45	74
Welder, Multiquip, BLW-300SS	23	Diesel	45	74
Welder, Multiquip, GA 3800	7.5	Gas	50	73

Noise levels from construction of the BSEP facilities will vary with the level of activity, numbers of pieces of equipment operating, and the location of the construction activity. The CadnaA noise model software was used to estimate construction noise levels on the construction site and at the nearest sensitive receptors. The acoustical model is based on standard hemispherical free-field propagation algorithms and assumes non-absorptive ground attenuation. Two scenarios were modeled: 1) peak construction activity during the seventh month; and 2) average construction activity during the twelfth month. Table 5.8-7 shows the

construction equipment, the associated sound pressure levels for each piece of equipment, and the assumptions used for modeling each of the scenarios.

Table 5.8-7 BSEP Equipment Noise Emissions

Scenario 1: Peak Construction (Month 7)	Scenario 2: Average Construction (Month 12)
4 Air compressor (82dB)	6 Air compressor (82dB)
24 Asphalt Paver (85dB)	1 Cat Blade (84 dB)
16 Cat Dozer (84 dB)	2 Cat Backhoe (84dB)
8 Cat Blade (84 dB)	1 Cat Compactor (60dB)
16 Water Trucks (84 dB)	1 Crane, 150-ton (86dB)
4 Cat Backhoe (84dB)	4 Crane, 20-ton (84dB)
2 Cat Compactor (60dB)	4 Crane, 40-ton (84dB)
2 Crane, 150-ton (86dB)	3 Cat Loader (80dB)
1 Crane, 20-ton (84dB)	3 Cat Trencher (80 dB)
2 Crane, 40-ton (84dB)	1 Concrete Pump truck (82 dB)
2 Cat Loader (80dB)	9 BLW-300SS Welder (74 dB)
2 Cat Trencher (80 dB)	9 GA 3800 Welder (73 dB)
2 Concrete Pump truck (82 dB)	6 Onsite welding truck (75 dB)
7 BLW-300SS Welder (74 dB)	2 Onsite fuel lube truck (80 dB)
7 GA 3800 Welder (73 dB)	5 Onsite flatbed truck (74 dB)
2 Onsite welding truck (75 dB)	1 Onsite Watering Truck (84 dB)
3 Onsite fuel lube truck (80 dB)	4 Onsite dump truck (84 dB)
2 Onsite flatbed truck (74 dB)	7 Onsite ¾ Tone pickup (75 dB)
2 Onsite dump truck (84 dB)	
2 Onsite ¾ Ton pickup (75 dB)	
Assumptions: All noise sources originating from the power block area of site; all noise sources operating at the same time; no buildings on the site during construction to block or reflect noise; no ground absorption of noise. Note: Sound levels listed are Lmax at 50 feet from construction noise source;	

The results of the construction noise modeling show that a range of 55 dBA Ldn to 75 dBA Ldn would be expected around the BSEP plant site based on the estimated number of equipment items operating. The highest construction noise levels would occur in the power block area, with an aggregate noise level around 75 dBA Ldn. Site preparation activities in the beginning of Project construction would be in the lower range. The higher range levels would be expected during the period of construction when major Project equipment is being delivered and installed on site, piping and electrical systems are being installed, and solar array construction also is ongoing. Construction worker noise exposure may exceed OSHA noise limits of 85 dBA

within 15 to 20 yards of the heavy construction equipment operating on the site, which will require implementation of a hearing protection program for those work areas.

The CadnaA model scenarios predict that construction noise levels would attenuate to 40 dBA or less at the Project plant site's boundaries. The nearest offsite receptor (the East Residence located approximately 0.3 mile from the BSEP site's eastern boundary has an ambient noise level of 43.3 dBA Ldn. Since the construction noise level would be less than 40 dBA at the East Residence, the combined ambient plus construction noise level would not result in an increase above the ambient noise level. Similarly, at the remaining residential locations of concern, because of their distance from the Project site, noise levels would be unaffected by Project construction activities. Thus, the combined noise level of ambient plus Project-generated construction noise at the nearest residential receptors would not exceed the 65 dB Ldn exterior noise level threshold for residential uses established by the Kern County General Plan Noise Element. Due to the temporary nature of construction noise and the predicted low construction noise levels at the nearest residences, BSEP construction noise impacts would be less than significant.

Linear Facilities

New offsite Project linear facilities include a 17.6-mile natural gas pipeline that would interconnect with an existing Southern California Gas pipeline west of California City. Additionally, there will be a new 230 kV transmission line constructed for which there are two options: one option would run west from the power block across SR-14 to a new switchyard and then follow the existing LADWP ROW to the Barren Ridge Switching Station; the other option would extend from the power block directly to the Barren Ridge Switching Station.

Construction of the Project's linear facilities (pipelines and transmission lines) will use construction equipment that produce similar noise levels to the equipment used on the plant site. The transmission line interconnection will pass through primarily undeveloped areas. Inherent in the construction of linear facilities is that the construction site moves constantly so that no particular area is exposed to noise for more than a relatively short time. For these reasons, potential noise impacts from the construction of Project linear facilities would be less than significant.

5.8.3.3 Operation

Plant Site

For most of the time when the Project is in operation, BSEP equipment is expected to operate essentially continuously and produce a steady sound level. Periodic short-term noise level increases can occur during plant startup or shutdown, during load transitions, or during opening of steam relief valves to vent pressure. The onsite operating equipment and associated noise emissions for the BSEP are listed in Table 5.8-8; Table 5.8-8 also presents the octave band levels used to model the noise for BSEP operations.

Table 5.8-8 BSEP Equipment Noise Emissions

Equipment Description	Sound Power Level									
	Octave Band Center Frequency, Hz									dBA (3 ft)
	32.5	63	125	250	500	1000	2000	4000	8000	
Steam Turbine Generator (enclosed)	86	86	85	82	84	83	82	78	70	85
Boiler Feed Water Pumps	85	87	90	91	92	88	83	84	80	92
Heat Transfer Fluid (HTF) Pumps	86	87	90	91	92	89	85	86	80	92
Circulating Water Pumps	85	97	90	91	92	87	83	85	80	90
Start-up Boiler (with inlet fan silencer)	85	85	86	87	85	83	80	78	70	85
Cooling Tower	121	122	121	118	114	112	108	109	107	118

Onsite Project operational phase noise levels for the BSEP were calculated using the CadnaA model, based on the equipment noise emissions data in Table 5.8-8 and the planned layout of facilities on the Project site. The acoustical model is based on standard hemispherical free-field propagation algorithms and assumes non-absorptive ground attenuation. Input and assumptions used for the CadnaA model of operational phase noise levels are summarized below:

- Cooling tower unit (with 11 fans) at 118 dBA;
- 6 Heat Transfer Fluid (HTF) pumps (3000 HP; height 25 feet) at 92 dBA each;
- 2 Circulating water pumps (2000 HP; height 37.5 feet) at 90 dBA each;
- 2 Boiler feed water pumps (3500 HP; height 25 feet) at 92 dBA each;
- 2 Startup boilers (with inlet fan silencer) at 85 dBA each;
- 1 Steam turbine generator (275 to 280 MW) at 85 dBA;
- Layout of the solar mirror arrays (height 25 feet);
- No ground absorption of noise.

Figure 5.8-2 presents the noise contours for the operational phase of the Project. Onsite noise levels at locations in close proximity to the combustion turbines are anticipated to be above 85 dBA. The proposed Project will be required to implement administrative procedures and hearing protection measures to ensure compliance with OSHA requirements for workplace hearing protection. With the required hearing protection program, onsite Project operations noise impacts would be less than significant.

Offsite noise levels for the operational phase of the Project were evaluated using the CadnaA model and the same data on Project equipment emission levels and site layout as used to calculate onsite noise levels. As shown in Figure 5.8-2, the projected operational noise levels attenuate to less than 40 dB before reaching the Project plant site boundaries. Thus, the projected noise contours would diminish to the point of

being indistinguishable from ambient levels before reaching any of the offsite noise sensitive or residential receptors. Thus, the combined noise level of ambient plus Project-generated operations noise at the nearest residential receptors would not exceed the 65 dB Ldn exterior noise level threshold for residential uses established by the Kern County General Plan Noise Element. Project operations phase noise impacts at offsite receptors would be less than significant.

Linear Facilities

Operation of Project gas pipelines will produce no audible noise. The buried gas line will be silent from any distance. Audible noise from electrical transmission lines are related to corona effects; (corona is the ionization of the air at the surface of the energized electrical conductor and suspension hardware stemming from the high electrical field strength at the conductor surface). Corona-generated audible noise from transmission lines is generally characterized as a crackling or hissing noise. Discharges on the three different phase conductors occur at different times.

Although conductors are designed to minimize corona discharges, surface irregularities caused by damage, insects, raindrops or airborne contaminants may locally enhance the electric field strength sufficiently high for corona discharges to occur. The noise level generated by corona from overhead power lines is affected by various parameters such as:

- Atmospheric conditions,
- Line length,
- Height above ground,
- Size of conductors and their configuration,
- Type of connection,
- Bundle conductor composition,
- Voltage gradient, and
- Ground resistance.

Modern transmission lines are designed, constructed, and maintained so that during dry conditions they will operate below the corona inception voltage, meaning that the line will generate a minimum of corona-related noise. The corona hum typically would produce noise levels ranging up to 30 dBA, measured at the edge of the transmission line ROW during dry conditions. A noise level of 30 dBA would be practically unnoticeable, easily masked by other ambient noises. Corona levels (and audible noise levels) are highest during heavy rain when the conductors are wet, but the noise generated by the rain likely would be greater than the noise generated by the corona, and thus the increased corona-related noise would not be noticeable. Thus, no significant noise impacts would be expected from Project linear facilities during operation.

5.8.3.4 Cumulative Impacts

Two projects have been identified for the cumulative impacts analysis: the Pine Tree Wind Development Project and LADWP's Barren Ridge-Castaic Transmission Project. The Pine Tree Wind Development Project is currently under construction and will consist of 80, 1.5 megawatt (MW) wind turbine generators

located on approximately 8,000 acres about six miles west of the BSEP site. Due to its distance from the BSEP site and the fact that no significant noise impacts were identified in the Final EA/EIR for the Pine Tree project, no cumulative noise impacts would result when considered together with the BSEP. The LADWP Barren Ridge-Castaic Transmission Project is currently in the environmental review process, and the project will upgrade and build new transmission capacity from the Barren Ridge Switching Station approximately 1.5 miles southwest of the BSEP site to the Castaic Power Plant near Santa Clarita in unincorporated Los Angeles County much further south of the BSEP site. Noise emissions from construction at Barren Ridge for the Barren Ridge-Castaic Transmission Project would not contribute substantially to the projected BSEP construction or operations noise levels. Thus, no significant cumulative noise impacts would be expected.

5.8.4 Mitigation Measures

The following mitigation measures will be implemented to reduce noise emissions and ensure that Project construction and operation noise impacts are less than significant.

NOISE-1 During both construction and operation, warning signs will be posted in high noise areas and a hearing protection program will be implemented for work areas where noise levels exceed 85 dBA.

NOISE-2 During project operations, all noise control equipment will be maintained in good working order in accordance with manufacturers' specifications.

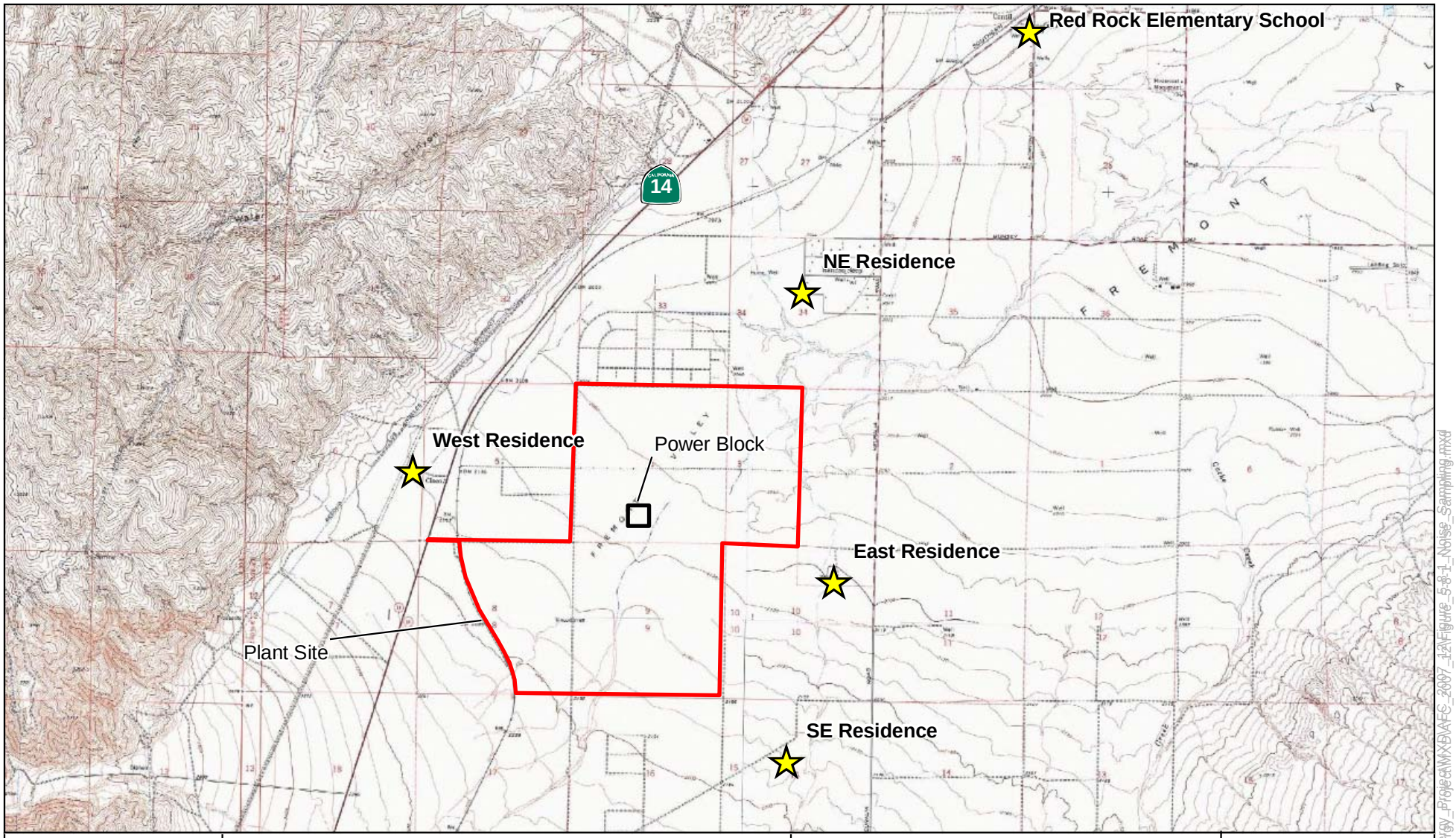
5.8.5 References

CadnaA Noise Model, 2005. Datakustik GmbH. Grifenberg, Germany.

Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Ordinance, California Department of Health Services, 1977.

Kern County, 2004. Kern County General Plan. Noise Element. Draft January.

Occupational Safety & Health Administration, 2007. 29 Code of Federal Regulations, Subpart H, Section 1910.95, Occupational Noise Exposure.



Map Location

Legend

- Plant Site
- Power Block
- Noise Sampling Locations

N
W
E
S

Scale: 1:60,000

0 0.5 1 1.5 2 Miles

Source: USGS 2007;
WorleyParsons 2007;

Beacon Solar Energy Project

Noise Sampling Locations
Figure 5.8-1

Beacon Solar

ENSR | AECOM

Project: 10056-014
Date: March 2008

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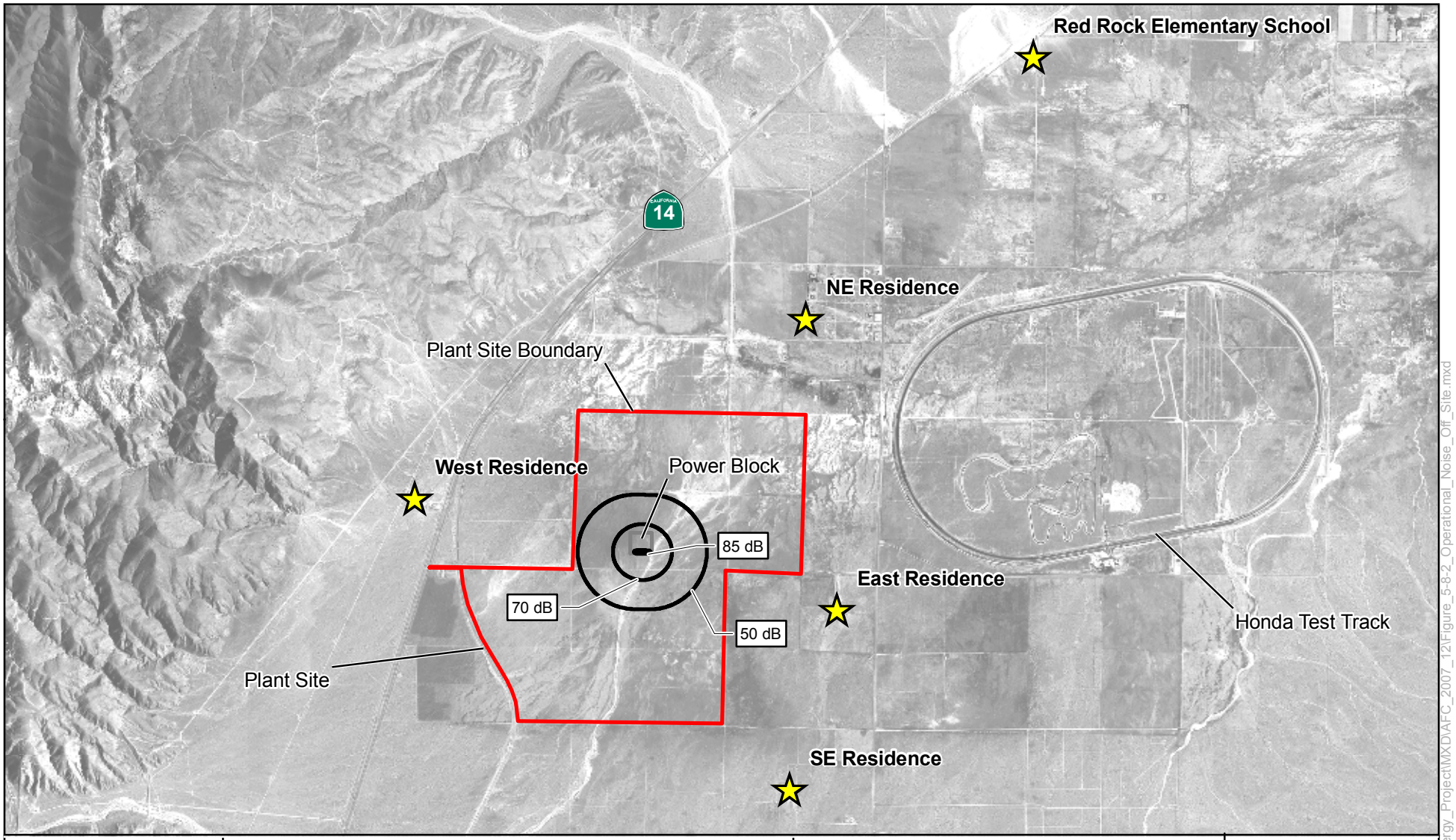

Map Location

Legend

- Plant Site
- Power Block
- Noise Sampling Locations
- Operational Noise Level Contour

N W E S

1:60,000

0 5,000 10,000 15,000 Feet

Source: NAIP 2006; WorleyParsons 2007;

Beacon Solar Energy Project

Operational Noise Contour Map (Off-Site Receptors)

Figure 5.8-2

Beacon Solar

ENSR | AECOM

Project: 10056-014
Date: March 2008

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