4.12 NOISE

4.12.1 Regulatory Setting

Federal Regulations

No federal regulations govern offsite (community) noise. The Occupational Safety and Health Act of 1970 specifies measures designed to protect workers against the effects of noise exposure and lists permissible noise level exposure as a function of the amount of time to which a worker is exposed. Occupational Safety and Health Administration (OSHA) regulations also dictate hearing conservation program requirements and workspace noise monitoring requirements. OSHA requirements limit worker noise exposure to 90 A-weighted decibels (dBA) over an 8-hour work shift. Furthermore, if 8-hour worker noise exposure at a work site exceeds 85 dBA, the area must be posted as a noise hazard zone; and a hearing conservation program would be required.

United States Fish and Wildlife Service (USFWS) has established a level of 60 dBA equivalent continuous noise level (Leq) as the maximum permissible noise level to which certain riparian bird species may be subjected during the mating and nesting seasons (see Section 4.4).

State Regulations

State Government Code requires counties to draft a Noise Element for their General Plans to establish acceptable noise limits for various land uses. The Imperial County General Plan contains a *Noise Element* which provides land use compatibility criteria as Community Noise Equivalent Level (CNEL) for acceptable land use noise levels. CEQA Guidelines defining a significant noise effect require that the impacts of a project be considered cumulatively in conjunction with those of other projects planned for the area.

Imperial County Regulations

The County is the agency responsible for regulating and controlling noise through the *Noise Element* of the County General Plan and the *Noise Ordinance* of the County's Codified Ordinances. The *Noise Element* of the Imperial County General Plan provides a program for incorporating noise issues into the land use planning process with a goal of minimizing adverse noise impacts to noise-sensitive receptors. The *Noise Element* specifies construction hours and noise limits and the acceptable property line operational noise levels at various land uses for day, evening, and night periods for the County *Noise Ordinance*.

Noise Element

The *Noise Element* of the Imperial County General Plan examines noise sources and provides information to be used in setting land use policies to protect noise-sensitive land uses and for developing and enforcing a local noise ordinance. The *Noise Element* provides a program for incorporating noise issues into the land use planning process with a goal of minimizing adverse noise impacts to receptors such as residences, schools, and hospitals, which are sensitive to noise.

The County identifies Noise Impact Zones for sensitive receptors likely to be exposed to significant noise (greater than 60 dB CNEL or 75 dB Leq) from roadways, railroads, airports, and agricultural activities. The purpose of the Noise Impact Zone is to define areas and properties where an acoustical analysis of a

proposed project is required to demonstrate project compliance with land use compatibility requirements and other applicable environmental noise standards. Any property within 1,500 feet of an interstate highway or 1,100 feet of a State highway is within a Noise Impact Zone, as is any property within 0.25 mile (1,320 feet) of existing farmland that is in an agricultural zone.

An acoustical analysis is required for any action that would be located, all or in part, in a Noise Impact Zone. According to the *Noise Element*, if the future noise levels from the action are within the normally acceptable noise level guideline but result in an increase of 5 dBA CNEL or greater, the action would have a potentially significant noise impact; and mitigation measures must be considered. If the future noise level after the action is completed is greater than the normally acceptable noise level, a noise increase of 3 dBA CNEL or greater should be considered a potentially significant noise impact; and mitigation measures must be considered.

Land use compatibility defines the acceptability of a land use in a specified noise environment. Noise/Land Use Compatibility Guidelines are provided in the *Noise Element* to evaluate potential noise impacts and provide criteria for environmental impact findings and conditions for project approval. An acoustical analysis is required to demonstrate conformance of a proposed project with Noise/Land Use Compatibility Guidelines. These guidelines categorize noise levels at residential land uses as "normally acceptable" up to 60 dBA day-night average sound level (Ldn) or CNEL and as "conditionally acceptable" up to 70 dBA Ldn or CNEL.

Noise Ordinance

The County enforces construction and operation noise standards specified in the *Noise Element* through the *Noise Ordinance*. Noise-generating sources in Imperial County are regulated under the County of Imperial Codified Ordinances, Title 9, Division 7 (Noise Abatement and Control) (County 2012). The noise standards of the Ordinance limit the hours of construction and the level of noise emitted by the construction, as well as the operational noise levels at various land uses for day, evening, and night. Noise limits are established in Chapter 2 of this ordinance and shown in Table 4.12-1.

Table 4.12-1: Imperial County Property Line Noise Limits

Zone	Time	Average Hourly Sound (Leq)
Residential Zones	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Multi-residential Zones	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Commercial Zones	10 p.m. to 7 a.m.	55
Light Industrial/Industrial Park Zones	Anytime	70
General Industrial Zones	Anytime	75
Note: When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dB Leq.		

Property line noise limits apply to noise generation from one property to an adjacent property. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate. These

standards do not apply to construction noise. These standards are enforced through the County's code enforcement program on the basis of complaints received from persons impacted by excessive noise. The County may act to restrict disturbing, excessive, or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in an area. Noise received at the property line of a residence is limited to 50 dBA Leq in the daytime and 45 dBA Leq at night.

Under Section 90702.00 of the County's Codified Ordinances, sound level limits for industrial noise are set at 75 dBA Leq on or beyond the boundary of the property line at any time. Average hourly noise in residential areas is limited to 50 to 55 dB(A) from 7:00 a.m. to 10:00 p.m. and to 45 to 50 dB(A) from 10:00 p.m. to 7:00 a.m.

4.12.2 Existing Environmental Setting

Noise-Sensitive Land Uses

Noise-sensitive land uses in Imperial County include varying densities of clustered residential developments and noncontiguous residences, different densities and types of businesses and commercial developments, open space, and recreation. The locations and densities of these land uses, in conjunction with major transportation routes and other significant activities within the County such as construction, contribute to create the ambient noise conditions, or setting, of the area.

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of noise could adversely affect the use of the land. These land uses include uses such as schools, hospitals, residences, libraries, and recreation areas. Excessive exposure to noise can result in adverse physical and psychological responses in addition to interfering with sleep, speech, and concentration or diminishing the quality of life.

In addition to human noise-sensitive receptors, some protected animal species and their habitat may be considered sensitive noise receptors if present near construction and operational noise sources, especially during the species' breeding seasons. Many riparian bird species are sensitive to excessive noise. Imperial County is within a region that has potential for protected species. Undeveloped land in proximity of a project site (e.g., the Sonny Bono Salton Sea National Wildlife Refuge) may provide habitat for protected species which may or may not be noise sensitive. For example, the Yuma clapper rail is a protected bird species in the area of the refuge that is known to be sensitive to noise, i.e., noise levels above the USFWS limit of 60 dBA Leq during mating or nesting seasons.

Existing Ambient Noise Conditions

Topography and Climate

Imperial County is located regionally in a remote area of undeveloped land and land developed for agriculture and industrial uses including geothermal power plants and manufacturing. Noise amplitude and attenuation characteristics are key factors in the establishment of noise conditions and vary considerably according to natural climate and topographical features. Meteorological factors affecting noise characteristics within the County include major temperature changes, Santa Ana winds, and varying amounts and durations of rainfall. Imperial County is a desert community with a warm, dry climate. Summers are extremely hot and dry, while winters are temperate. Topographical features in the County include steep mountains, a central valley with elevation below sea level, and vast open space

areas. Man-made features within the County, such as buildings and structures, agricultural fields, and roadways, also affect noise amplitude and attenuation.

Noise Sources

Many activities which create objectionable noise levels in Imperial County, such as industrial operations and rail switching yards, are located within cities which are not a part of the County General Plan. The highest traffic volumes, which are major noise sources, are within the Cities of El Centro and Calexico. This noise section addresses only noise sources which affect unincorporated areas of the County.

The principal noise sources in Imperial County are the transportation sources, aircraft, rail lines, motor vehicles and agricultural operations. In rural areas of the County, mining and off-road vehicle activity also create substantial noise, but these occur generally in areas without noise-sensitive receptors.

Aircraft Noise

Aircraft traffic is another of the more prevalent sources of noise within the County, especially in proximity to airports and airstrips. Aircraft traffic noise varies in how it affects land uses depending upon the type of aircraft, distance of the land use from airports and flight paths, and topographical settings and other physical land features such as landscaping, walls, buildings, and other structures. Some variables that affect the amount of noise emitted from aircraft are the type, speed, and altitude. Another variable affecting the overall measure of noise is a perceived increase in sensitivity to aircraft noise at night.

Aircraft noise which may affect sensitive land uses occurs in the vicinities of seven airports in the County: Imperial County, Brawley Municipal, Calexico International, Calipatria Municipal, Holtville Airstrip, Salton Sea, and the Naval Air Facility (NAF) El Centro, which is located north of the townsite of Seeley. The noise levels and associated areas of noise impact are quantified in noise contour maps, contained in the *Noise Element*, which usually are products of FAA-mandated noise surveys, and the 1996 Airport Land Use Compatibility Plan.

Railroad Noise

The Union Pacific Railway is the primary source of railroad transportation noise in the County. The main line right-of-way runs from the Riverside County border, just east of the Salton Sea, southeast to Niland. From Niland, the main line continues southeast to Yuma, Arizona; a branch runs south to Calipatria, Brawley, Imperial, El Centro, and Calexico.

Two other railways, located west of Seeley, are the U.S. Gypsum rail line to their mining site in the Fish Creek Mountains and the San Diego and Arizona Eastern Railroad (SD&AE) from San Diego through the Jacumba Mountains. The U.S. Gypsum line passes through uninhabited areas, including a military bombing range, and does not impact sensitive receivers.

Traffic Noise

Roadway traffic is one of the more prevalent sources of noise within the County along highly utilized transportation corridors such as I-8, SR-86, and SR-111. Traffic noise varies in how it affects land uses depending upon the type of roadway, distance of the land use from that roadway, topographical setting, and other physical land features such as landscaping, walls, buildings, and other structures. Some

variables that affect the amount of noise emitted from a road are speed of traffic, flow of traffic, and type of traffic (e.g., tractor trailers versus cars). Another variable affecting the overall measure of noise is a perceived increase in sensitivity to vehicular noise at night.

Vehicle noise level information is obtained from measurements using a sound level meter and is calculated using highway traffic volume, speed, and vehicle mix information. The *Noise Element* lists the interstate and State highways in Imperial County and shows the vehicle volumes, mixes, and calculated noise levels. The traffic volumes are based on data presented in the *Circulation and Scenic Highways Element*, while the vehicle mixes are based on Caltrans 1990 data (ICPDS 2001). Due to the relatively low volumes on most of the roadways in the unincorporated area of the County, noise contours would not be distinguishable at a scale which could be included with the *Noise Element*. A large-scale map (1 inch = 2 miles) with noise contours has been provided and is on file at the County Planning and Development Services Department. More detailed descriptions of the State highways and local roadways may be found in the *Circulation and Scenic Highways Element* of the General Plan.

The major east-west roadway in the County is I-8, which runs from Yuma, Arizona, to San Diego County, through the City of El Centro. SR-98 parallels I-8 on the south to serve the City of Calexico and the community of Ocotillo. SR-78 parallels I-8 to the north, serving the Cities of Westmorland and Brawley, and continues northeast to the community of Palo Verde. The Evan Hewes Highway is Old Highway 80, which parallels I-8 on the north from Ocotillo to Seeley, El Centro, and Holtville, then turns back southeast to again join I-8.

SR-86 and SR-111 are the main north-south roadways. SR-86 runs from SR-111 north of Calexico, through Heber and the Cities of El Centro, Imperial, Brawley, and Westmorland and northward to eventually connect with Interstate 10 (I-10) at Indio. It is a principal “farm-to-market” route for Imperial County agricultural products and carries a high percentage of heavy trucks. SR-86 also carries heavy recreational traffic on weekends. SR-111 is originates east of El Centro connecting Calexico to the Cities of Brawley and Calipatria and continuing north along the east side of the Salton Sea past Niland and Bombay Beach to also connect with I-10 at Indio.

Other state roads include SR-115, which runs northwest from I-8 to Holtville, then north to Brawley and Calipatria, and SR-186, a short spur running south from the eastern end of I-8 to the international border.

Industry Noise

Industrial and manufacturing facilities are also stationary noise producers that may affect sensitive land uses. Industrial land uses have the potential to exert a relatively high level of noise impact within their immediate operating environments. The scope and degree of noise impacts generated by industrial uses is dependent upon various critical factors, including the type of industrial activity, hours of operation, and the site’s location relative to other land uses.

Manufacturing and utility operations often emit noise which may impact sensitive receptors in the area of the plant. Existing major manufacturing sites within Imperial County are generally located away from concentrations of sensitive receptors. These include a gypsum plant in Plaster City; Spreckles Sugar; and geothermal power plants in the southeast Salton Sea, Heber, and East Mesa areas. Additional geothermal plants are planned.

Agricultural Noise

The predominant land use in Imperial County is agriculture. Noise sources associated with agricultural operations include the field machinery, especially when it is diesel-engine driven; heavy trucks used for delivering supplies and distributing products; and aircraft used for spraying crops.

Schools

Schools can be a source of nuisance noise for neighboring residential uses. Noise-generating activities include children at play, bells, and public address systems. Noise sources from high schools may include stadiums used for day and evening athletic events and the use of public address/loudspeaker systems, which can also generate substantial noise levels during the day and/or evening.

Other Sources

Noise sources not included above which are likely to be included in planning analyses include: construction noise; noise from commercial activities such as automotive and truck repair, kennels, and entertainment facilities; noise from building heating, ventilating, and air conditioning (HVAC) systems; and noise from recreational areas, including off-road vehicles. Other noise complaints can result from new housing tracts under construction.

Vibration

In addition to noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized by displacement, velocity, and/or acceleration. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Vibration can be felt outdoors, but the perceived intensity of vibration impacts are much greater indoors due to the shaking of the structure.

The most common sources of vibration are transit vehicles, construction equipment, and large vehicles. Several land uses are especially sensitive to vibration. These uses include, but are not limited to, hospitals, libraries, residential areas, schools, and offices.

4.12.3 Significance Criteria

The thresholds for significance of impacts for the analysis are based on the environmental checklist in Appendix G of the State California Environmental Quality Act (CEQA) Guidelines. Consistent with the CEQA Guidelines and the professional judgment of the County's staff and environmental consultants, the proposed Project would result in a significant impact on the environment if it would:

- Expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

- For a project located within an airport land use plan or where such a plan has not been adopted, within 2.0 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels

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

4.12.4 Impacts and Mitigation

NOI-1: Exposure of persons to or generation of noise levels in excess of established standards or substantial temporary or permanent increase in ambient noise levels in the project vicinity above existing levels

Construction

Construction of future renewable energy facilities associated with the proposed Project would have the potential to generate noise levels in excess of the standards established in the *Noise Element* of the Imperial County General Plan. Some construction activities would be similar for all types of renewable energy and would occur intermittently and vary in magnitude based on the type of construction activity in progress. Typical maximum sound pressures for common construction equipment as defined in the EIR/EIS prepared for the DRECP are presented in Table 4.12-2 below.

In addition to the common sources of construction noise described above, the following construction and decommissioning activities identified in the EIR/EIS prepared for the DRECP could be specific to each type of future renewable energy technology in Imperial County.

Solar Energy

Based on information presented in the DRECP EIR/EIS, future solar facilities may require relatively flat sites, which may require substantial grading, depending on the technology. Thus, grubbing, clearing, and site grading is assumed across the entirety of an area required for future solar generation. Equipment used to construct foundations would include bulldozers, excavators, loaders, and concrete trucks. This type of equipment and activity would typically generate noise levels between 74 dB to 88 dB Lmax at 50 feet or approximately 83 dBA Leq at 50 feet from the center of the equipment activity. If pile drivers are used for foundations, construction-generated noise levels are calculated to be approximately 88 dBA Leq at 50 feet from the pile impact point. Future solar power projects may require the construction of cooling evaporation ponds. Construction of the evaporation ponds would typically be done with bulldozers, loaders, and graders and is anticipated to generate noise levels of approximately 83 dBA Leq from the center of the active equipment.

Table 4.12-2: Noise Levels for Common Construction Equipment

Equipment	Typical Maximum Sound Pressure Level at 50 Feet from Source (dBA)
ATV	79
Backhoe/Trencher	85
Dump Truck	88
Front End Loader	85
Generators/Compressors	81
Grader	85
Personal Cars	74
Rollers/Compactor	74
Scraper/Dozer	85
Semi	86
Water Truck	88
Crew Delivery Bus	80
Flat-Bed Truck	88
Vibratory Post Driver	85
Concrete Truck	88
Forklift	83
Cranes/Lifts	83

Wind

Meteorological Stations: Based on information presented in the DRECP EIR/EIS, temporary meteorological stations may be required for future wind energy facilities. As a worst case, it is assumed that meteorological stations would be 328-foot-tall, self-supporting monopole structures with an assumed long-term disturbance footprint of 900 square feet (0.02 acre). Permanent meteorological stations are anticipated to be collocated with the wind turbines. Construction equipment used to erect the temporary towers could include cranes, pile drivers, bulldozers, loaders, and concrete trucks. If pile driving is not required, construction-generated noise levels would average approximately 80 dBA Leq 50 feet from the center of equipment activity. If pile driving is required, average hourly noise levels would be approximately 88 dBA Leq at 50 feet from the impact point of the hammer and pile.

Blasting: Depending on local geological conditions, explosive blasting for future wind turbine foundations might be needed. Blasting would create a compressional wave in the air (air blast overpressure), and the audible portion would be noise. Blasting would generate the maximum noise levels of approximately 95 dBA Lmax or 74 dBA Leq.

Staging/Laydown Area: At each turbine site, vegetation clearance and grading would be required to prepare the ground for heavy lifting cranes and transport vehicles. Typically, an area of about 3 acres would be cleared, within which the ground is compacted and stabilized to enable the use of heavy lifting cranes. Construction equipment would typically include bulldozers, loaders, graders, and ground compactors and would generate noise levels of approximately 83 dBA Leq.

Geothermal

Well Field Facilities: Well fields consist of multiple injection and production wells situated on concrete pads that hold all the equipment necessary to operate a well. Geothermal production fluid pipelines and

injection fluid pipelines run throughout the well field to circulate steam and fluids between the well field and the generation site. Drilling associated with well fields would generate noise levels of approximately 85 dBA Leq at 50 feet from the center of equipment. Well head and pipeline construction would involve a welder truck and cranes. These activities would generate noise levels of approximately 80 dBA Leq at 50 feet.

Operation

Operation and maintenance of future renewable energy developed under the proposed Project would have the potential to generate noise levels in excess of the standards established in the *Noise Element* of the Imperial County General Plan. Future renewable energy facilities would include parking areas, mechanical ventilation for offices, and maintenance facilities that could generate noise and may require maintenance activities at night, which would contribute to noise impacts for nearby sensitive receptors. In addition to these common sources of operational noise described above, the following operational sources of noise identified in the EIR/EIS prepared for the DRECP could be specific to each type of future renewable energy technology.

Solar

Typical noise sources associated with solar facilities operations and maintenance include employee vehicles accessing the site, power inverters, tracking motors on individual panels, and maintenance of the panels such as cleaning and repair. Based on a review of noise assessments prepared for solar development projects in southern California, the DRECP EIR/EIS determined that a typical power inverter generates 66 dBA Leq measured at a distance of 50 feet without an enclosure. The tracking motors that tilt an array of panels typically generate 38 dBA Leq at 50 feet. Maintenance, panel washing, and cleaning of the facility generate approximately 76 dBA Leq at 50 feet. Because solar facilities operations and maintenance require a low number of employees, increased traffic noise associated with employees would be negligible.

Concentrated solar power technologies (parabolic trough and power tower) generally require additional equipment, such as small-scale boilers and cooling towers, which would create additional noise sources. Other sources may include space-heating boilers and diesel-fueled emergency power generators or emergency fire water-pump engines (typically operating only a few minutes per month for preventive maintenance purposes). Noise levels from these sources would be similar to light industrial noise levels (80 to 85 dBA Leq at 50 feet); however, these sources are well documented, and the industry has developed effective methods for reducing noise levels at the source to comply with local noise standards. These sources are typically placed within structures or enclosures.

Wind

Turbines: Wind turbines generate two types of noise: aerodynamic and mechanical. The significance of a turbine's noise impact is a combination of both. The blades passing through the air generate aerodynamic noise, and the turbine's internal gears and components generate mechanical noise. Large-scale turbines used by utilities are insulated to prevent mechanical noise from proliferating outside the nacelle (cover housing) or tower. Smaller residential turbines are more likely to produce noticeable mechanical noise due to inadequate insulation. The magnitude of aerodynamic noise is related to the ratio of the blade tip speed to wind speed and corresponds to the generation of power.

Recent improvements in mechanical design of large wind turbines have resulted in significantly reduced mechanical noise from both broadband and pure tones. Thus, the noise emission from modern wind turbines is dominated by broadband aerodynamic noise, and the wind turbine sound level is primarily a function of wind speed.

Depending on the turbine model and the wind speed, aerodynamic noise can generate a whooshing or pulsing effect. Most noise radiates perpendicular to the blades' rotation; however, since turbines rotate to face the wind, they may radiate noise in different directions each day. Wind turbines generate broadband noise with frequency components from 20 hertz to 3.6 kilohertz. The frequency components vary with pitch of the blade and wind and blade speed. The "swish-swish" sound is the high-frequency noise of blade tip turbulence; it does not contain low frequencies. Large variable-speed wind turbines often rotate at slower speeds in low winds and increase in higher winds until the limiting rotor speed is reached. This results in much quieter operation in low winds than comparable constant-speed wind turbines.

As the turbines typically operate both during the daytime and at night, the impacts of turbine noise are typically based on the change in the lowest nighttime ambient noise levels. Wind generates noise due to interactions between wind and vegetation, which dominates and determines the existing ambient noise levels. While several factors influence the sound level generated by wind flowing over vegetation, the total magnitude of wind-generated noise depends more on the size of the windward surface of the vegetation than the foliage density. Thus, whether a wind turbine exceeds the background sound level will depend on how much the ambient noise level varies with wind speed.

Favorable conditions for sound propagation can typically occur on a clear night when the temperature increases and a temperature inversion is created, which forces sound to refract or bend downward (i.e., the sound of the turbine will carry farther). This condition would typically occur only at lower wind speeds; that is, less than 9 feet per second, as stronger winds reduce the effect of an inversion. Modern wind turbines have a required operational minimum wind speed requirement of about 8 to 13 feet per second; thus, increased noise propagation associated with temperature inversion is anticipated to be minimal in most operations. The exception would be in sheltered valleys with relatively low ambient noise levels; however, the effects of wind speed on noise propagation would generally dominate over those of temperature gradient.

Whether the turbine noise is intrusive depends not only on its distribution of amplitude and frequency, but also on the background noise, which varies with the level of human and animal activities and meteorological conditions (primarily wind speed). While there is no uniform standard for regulating noise from wind turbines and no common noise level for wind turbines, setbacks of 1,800 feet or greater from local residences and habitat containing threatened or endangered noise-sensitive species may avoid the need for detailed studies. This distance would be refined based on make, model, and acoustic package of specific wind turbines and the applicable regulation and detailed noise-propagation modeling.

Geothermal

Typical noise sources associated with geothermal facilities operations and maintenance include the turbine/generators and the cooling towers and various secondary noise sources including pumps and equipment associated with the crystallizer and separator. Operational noise levels of an existing geothermal facility in Imperial County were recorded at 70 dBA Leq at approximately 100 feet.

In addition to operation noise associated with the main facilities, noise is also generated during ongoing drilling operations and would be similar to noise generated under construction and exploration, although longer durations of the noise related to the well drilling would be expected. In addition, construction of injection wells and sump pits would increase local noise in the short-term impacts.

Biomass and biofuel projects have been environmentally reviewed and are available for review at the planning and development services department.

The proposed Project has taken steps to minimize potential impacts related to operational noise by developing a 0.5-mile buffer around all urban areas for the overlay zones. Consequently, all future renewable energy facilities developed under the proposed Project would be located at least 0.5 mile from any urban area within Imperial County, thereby ensuring that all potential sensitive receptors within these areas would be protected by adequate setbacks that would allow noise to attenuate over this distance. Nonetheless, the potential does exist for sensitive receptors within rural areas to be exposed to operational noise levels that temporarily increase ambient noise levels in excess of the standards established in the County *Noise Element* and result in a significant impact.

Mitigation Measures

Mitigation Measures NOI-1a through NOI-1c are based on measures presented in the DRECP EIR/EIS. Furthermore, additional mitigation may be developed during environmental evaluation of specific future renewable energy projects developed in the future.

NOI-1a: Protect sensitive receptors from noise. Project proponents developing future renewable energy facilities shall demonstrate that the following requirements are implemented:

4. Future renewable energy facilities developed under the proposed Project should be located more than 0.5 mile from noise-sensitive receptors, including residences, churches, medical care facilities, schools, child care facilities, public parks, public recreation areas, quiet recreation areas, and wildlife or wilderness areas.

5. Project proponents should take measurements to assess the existing background noise levels at sites and compare them with the anticipated noise levels associated with the project.

6. Project proponents should prepare a noise monitoring and mitigation plan including designs to (a) minimize noise impacts to noise-sensitive receptors, limit increases to less than a 5 to 10 dBA increase above ambient levels, and not exceed local noise standards; (b) address project-generated noise impacts; and (c) acquire lands to serve as buffers around the proposed facilities.

NOI-1b: Implement noise reduction techniques. Project proponents developing future renewable energy facilities shall implement the following requirements:

10. Limit noisy construction activities (including truck and rail deliveries, pile driving, and blasting) to the least noise-sensitive times of day consistent with the requirements of the County of Imperial Noise Ordinance.

11. Consider use of noise barriers such as berms and vegetation to limit ambient noise at plant property lines, especially where noise-sensitive receptors may be present.

12. Ensure all project equipment has the appropriate sound-control devices and shield-impact tools. Use battery-powered forklifts and other facility vehicles and flashing lights instead of audible backup alarms on mobile equipment.

13. Locate stationary construction equipment (such as compressors and generators) as far as practical from nearby residences.

14. If blasting or other noisy activities are required during the construction period, notify nearby residents and the permitting agencies 24 hours in advance.

15. Properly maintain mufflers, brakes, and all loose items on construction and operation-related vehicles to minimize noise and ensure safe operations. Operate trucks as quietly as possible, while considering local conditions. Advise about downshifting and vehicle operations in residential communities to keep truck noise to a minimum.

16. Install mufflers on diesel and gas-driven engine air coolers and exhaust stacks. Equip emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.

17. Contain project facilities within buildings or other types of effective noise enclosures, when necessary and feasible.

18. Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level to appropriate levels in normal work areas.

NOI-1c: Protect residences from wind turbine noise. Project proponents developing future wind energy facilities shall demonstrate that the proposed wind energy conversion system complies with setbacks defined by the lead agency. Minimum setbacks are generally 1,800 feet from each generator to the nearest receptor. For future wind energy systems that would occur nearer than 3,000 feet from receptors (including habitable dwellings), acoustical studies shall be prepared to demonstrate compliance with local standards.

Significance After Mitigation

Implementation of the mitigation measures NOI-1a through NOI-1c would reduce impacts associated with exceeding established noise standards during construction and operation of future renewable energy facilities to a level less than significant.

NOI-2: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels

Construction and Operation

Construction of future renewable energy facilities under the proposed Project would generate groundborne vibrations associated with the movement of heavy equipment, earth movement, drilling, pile driving, rock breaking, and explosives blasting. The duration and intensity of these groundborne vibrations would vary based on the type of equipment being used and the methods employed. Pile driving, soil compacting, jackhammering, and demolition-related activities generate the greatest level of groundborne vibration but dissipate below a level of concern at distances ranging beyond 200 feet. Vibration associated with other types of construction equipment are well below the levels of concern at

distances ranging beyond 65 feet. Although it is not anticipated that ground vibrations from typical construction equipment would reach levels that could damage structures, construction activities would be required to implement measures to minimize vibration near sensitive or historic land uses that would ensure that impacts would be less than significant.

Operation of wind, geothermal, and solar renewable energy facilities utilize high-speed rotating mechanical equipment, including turbines and generators, that may generate groundborne vibrations. Such vibrations may arise due to an imbalance in a turbine; however, design of wind, geothermal, and solar renewable energy facilities typically includes features to maintain balance to avoid substantial vibration levels. Furthermore, renewable energy facilities typically include vibration-monitoring systems to ensure that the equipment remains balanced. Vibration monitoring combined with appropriate setback distances between facilities and the nearest sensitive receptors (typically on the order of a half-mile or more for renewable energy), as well as the characteristics of the buildings surrounding turbine generators, would reduce vibration below the threshold of detectability beyond the project boundary. Furthermore, the proposed Project has taken steps to minimize potential impacts related to operational noise by developing a 0.5-mile buffer around all urban areas for the overlay zones. Consequently, all future renewable energy facilities developed under the proposed Project would be located at least 0.5 mile from any urban area within Imperial County, thereby ensuring that all potential sensitive receptors within these areas would be protected by adequate setbacks that would allow vibration to dissipate over this distance. Nonetheless, the potential does exist for sensitive receptors within rural areas to be exposed to operational vibrations from future renewable energy facilities and result in a significant impact.

Mitigation Measures

Mitigation Measure NOI-1a would also be implemented to reduce impacts associated with vibration to a level less than significant.

NOI-2: Evaluate Potential for Vibration Impacts. Project proponents of future renewable energy facilities would be required to evaluate the potential for vibration to impact sensitive receptors during construction and operation and develop appropriate mitigation measures if necessary.

Significance After Mitigation

Implementation of the mitigation measures NOI-1a would reduce impacts associated with vibration to a level less than significant by requiring all future renewable energy facilities developed under the proposed Project to be located more than 0.5 mile from noise-sensitive receptors, including residences, churches, medical care facilities, schools, child care facilities, public parks, public recreation areas, quiet recreation areas, and wildlife or wilderness areas. This would ensure that sensitive receptors within rural areas would be protected by a 0.5 mile buffer that would allow vibrations to dissipate below the threshold of detectability. In the event that any potential impacts related to vibration are not addressed by NOI-1a, implementation of NOI-2 would ensure that measures were developed to reduce remaining impacts associated with vibration to a level less than significant.

NOI-3: Expose people residing or working in the project area to excessive noise levels within 2.0 miles of a public or private airport or within an airport land use plan

Some portions of the Renewable Energy Overlay Zones are located within less than 2.0 miles of the Brawley Municipal Airport, Cliff Hatfield Memorial Airport, and Salton Sea Airport. Additionally, several

small private airstrips used primarily for crop dusting operations may be located within less than 2.0 miles of the proposed Renewable Energy Overlay Zones. The proposed Project has been developed to identify new opportunities for renewable energy and assures that Imperial County can meet the needs for future development while remaining consistent with identified land use and environmental goals. Consequently, implementation of the proposed Project would be limited to construction of future renewable energy facilities within the proposed Renewable Energy Overlay Zones. The proposed Project would not construct any new housing that could expose residents to excessive noise levels associated with nearby airports. Similarly, employees operating and maintaining future renewable energy facilities would not be exposed to excessive noise levels associated with nearby airports. Therefore, impacts would be less than significant, and no mitigation measures would be required.

4.12.5 Cumulative Impacts

It is not anticipated that future renewable energy facilities developed under the proposed Project would contribute to cumulative noise impacts. The greatest potential impacts related to noise would occur during construction; however, adherence to the 0.5-mile buffer around all urban areas for the overlay zones would minimize potential impacts on sensitive receptors. Additionally, it is unlikely that the majority of the foreseeable projects within the County would be under construction at the same time as future renewable energy facilities developed under the proposed Project. Furthermore, future renewable energy facilities developed under the proposed Project would occur over a long period of time; and it is unlikely that a large number of future facilities would be developed concurrently. Due to the long duration that both foreseeable projects within the County and renewable energy facilities to be developed under the proposed Project would be spread across, it is unlikely that high levels of construction emissions would occur at once. Furthermore, implementation of mitigation measures NOI-1a through NOI-1c described above would mitigate construction noise to a level less than significant. Operational noise would also be minimized by adherence to the 0.5-mile buffer around all urban areas and implementation of mitigation measures NOI-1a through NOI-1c described above. Therefore, implementation of the proposed Project would not generate cumulatively considerable noise during construction or operation, and cumulative impacts would be less than significant.