Kimley»Horn

Memorandum

To: Round Hill Solar, LLC
From: Kimley-Horn
Date: July 17, 2020
Subject: **Noise Impact Assessment – Project Construction**

KHA #: **116766007 – Round Hill Solar**

1.0 Construction Noise

By comparison to other forms of power generation, the construction of a solar energy facility, such as the Round Hill project, is remarkably short and the activities that generate significant noise are minimal. Where a fossil or wind project would require extensive earthworks and the pouring of expansive concrete foundations over a period of many months, a solar facility only involves the installation of mounting posts for the panel racks, which generally follow the existing topography, and some trenching and road building activities.

In general, concrete foundations are avoided for the panel arrays. The most common method of installing the support posts is to drive them into the ground. This procedure produces a repetitive, metallic impact noise, which will be unavoidably audible for some distance. This activity is short-lived and will only occur for a period of a few days or weeks in any one area of the site.

In terms of the more traditional construction phases, Table 1.0.1 gives representative sound levels from construction equipment at the standard test distance of 50 feet[1] and at 1,000 feet.

[1] U.S. Dept. of Transportation, Federal Highway Administration, *Roadway Construction Noise Model User's* Guide, Table 1, Jan. 2006

Table 1.0.1
Typical Construction Equipment Sound Levels per the FHWA by Phase

Equipment Description	Typ. Sound Level at 50 ft., dBA	Est. Max. Total Level at 50 ft. per Phase, dBA*	Est. Max. Total Level at 1,000 ft. per Phase, dBA
Blasting			
Blasting (Max. Peak), *if employed*	94	94	64
Earthmoving Road, Substation Construction, and Electrical Line Trenching			
Dozer	85	85	55
Front End Loader	80		
Grader	85		
Backhoe	80		
Pile (Support Post) Driving			
Piling Auger	84	84	58.5
Truck Traffic Material Delivery			
Flatbed Truck	84	84	54
Erection Panel Installation			
Mobile Crane	85	85	55

*Not all vehicles are likely to be in simultaneous operation. Maximum level represents the highest level realistically likely at any given time.

While the maximum sound levels at 50 feet may appear high, these activities will generally occur at much greater distances – on the order of several hundred feet – from any off-site residences. The more moderate levels in the far right-hand column, which would occur at a distance of approximately 1,000 feet, represent the situation in a somewhat more realistic manner, but even these numbers are conservative in the sense that the actual distances to many homes in this area are greater than 1,000 feet. Additionally, anything in the path of the soundwave would further dampen the noise (trees, fencing, et cetera).

The installation of the panels will require a pile driver to drive support posts into the ground over the entire solar field. Therefore, worst-case operation noise from the pile driver would temporarily occur as close as approximately 50 feet from the property line. Each panel stand installation process is anticipated to last 5 minutes or less. The pile driver can produce a maximum instantaneous sound level of 84 dBA[2] at 50 feet when the hammer is operating. However, based on previous experience, a pile driver only operates at full power

approximately 20% of the time during each hour. Based on the standard noise attenuation rate of -6 dBA per doubling of distance for point sources, maximum off-site instantaneous levels from the pile driver operating at full power would be approximately:

84 dBA at 50 feet away (equal to the sound of an alarm clock)
78 dBA at 100 feet away
72 dBA at 200 feet away (equal to the sound of a washing machine)
66 dBA at 400 feet away
60 dBA at 800 feet away (equal to the sound of an electric toothbrush)

The nearest residences, approximately 200 feet away from the limits of panel installation areas, would experience a sound level of about 72 dBA for the time period when the supports are being installed in the section of the solar field nearest to the residence. This sound level will dissipate as they complete that portion of the installation and move to other areas of the solar field that are further away. However, setbacks of several hundred feet are proposed in most areas bordering residences. This creates a longer distance between construction noise and residences, further dampening the sound levels experienced in surrounding areas.

There is generally no need for concrete pouring in the solar fields. The base slabs for the inverters and other electrical equipment will be precast and dropped in place. The transformer base in the substation will likely be poured concrete. In these instances, a concrete pump truck typically generates a sound level of around 82 dBA at 50 feet[3], or roughly at the boundary of the substation. At the nearest residence, approximately 425 feet away, this sound level would decrease to a level of about 64 dBA and occur only intermittently during the day; probably only for a day or two. What is likely to be more audible during the construction of the substation and for a slightly longer period are intermittent back-up alarm beeps from earthmoving equipment used to prepare the area for the transformer base slab.

[2]Based on 105.8 dBA at the operator's ear, as specified by the Vermeer PD10 Pile Driver Operator's Manual (2012). According to Mr. Dale Siever of Vermeer Sales Southwest, the operator's ear is approximately 4 feet from the part of the pile driver where noise is emitted. Therefore, based on the standard noise attenuation rate of -6 dBA per doubling distance for point sources, noise from the pile driver would attenuate to approximately 84 dBA at 50 feet.
[3]Ibid.

In summary, the noise generating activities associated with the construction of the project will generally be limited to a post driving phase, when repetitive impact noise will be unavoidably audible throughout a limited area, and to more conventional noise from equipment involved in the construction of the substation, utility trenches, and roads. As with any construction site, unwanted noise will be intermittently generated over time but, in this case, the distances from where these activities are occurring to any off-site residences are large, so the resultant sound levels are not expected to be unreasonably high or long-lasting in duration.

If you have any questions, please feel free to contact us.