

BEFORE THE OHIO POWER SITING BOARD

In the Matter of the Application of Yellowbud Solar, LLC for a Certificate of Environmental Compatibility and Public Need.)))))	Case No. 20-972-EL-BGN
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DIRECT TESTIMONY OF EDDIE DUNCAN

1 **Q.1. Please state your name, title, and business address.**

2 **A.1.** My name is Eddie Duncan. I am employed by RSG as a Senior Director and lead
3 RSG’s acoustics work. My business address is 55 Railroad Row, White River Junction,
4 VT 05001.

5 **Q.2. What are your duties as a Senior Director?**

6 **A.2.** As Senior Director, I direct and manage projects related to acoustics and noise. This
7 includes noise assessments for projects from a wide variety of sectors, including solar
8 power development. I manage and mentor the acoustics staff, and am responsible for
9 strategy and client relationships.

10 **Q.3. What is your educational and professional background?**

11 **A.3.** I am Board Certified in Noise Control Engineering by the Institute of Noise Control
12 Engineering and am a member of the Acoustical Society of America where I served as a
13 member of the Technical Committee on Architectural Acoustics for over 10 years. I
14 received my Bachelor of Science in Engineering Science (B.S.), at Rensselaer Polytechnic
15 Institute, Troy, New York in 2003 and a Master of Science in Environmental Studies (M.S.)
16 at Green Mountain College, Poultney, Vermont in 2013.

17 I have 18 years of experience in the field of acoustics with much of that experience
18 measuring, modeling, and analyzing noise from renewable energy sources and power

1 transmission projects. I have worked across many different public and private sectors
2 including power transmission, renewable energy, transportation, public lands, recreation,
3 mining, manufacturing, healthcare, education, and commercial and residential
4 development.

5 **Q.4. On whose behalf are you offering testimony?**

6 **A.4.** I am testifying on behalf of the Applicant, Yellowbud Solar, LLC regarding its
7 application filed in Case No. 20-972-EL-BGN.

8 **Q.5. What is the purpose of your testimony?**

9 **A.5.** The purpose of my testimony is to describe the noise assessment study included in
10 the Application as Exhibit Q and to summarize the results of that study. I will also address
11 Conditions 14 and 16 of the Joint Stipulation, which I have reviewed.

12 **Q.6. Please describe the study included in the Application.**

13 **A.6.** RSG carried out a noise impact assessment for the Yellowbud Solar Project
14 (“Project”) to determine existing baseline acoustical conditions in the Project area and
15 model sound emissions of the primary sound-producing Project components, namely
16 inverters and transformers, so that projected sound levels could be compared to the existing
17 acoustical conditions. Typical operations of the Project include transformers and inverters
18 operating during the day, and only transformers operating at night. However, the inverters
19 may operate sometimes at night to provide reactive power output. As such, the study
20 assumed that all sources could operate at night.

21 The Project area is primarily agricultural with scattered residences and farmsteads
22 throughout. A total of 58 residences were included in the study of which 49 were non-
23 participating residences. Background sound level monitoring was conducted at four

1 locations. The four monitors were representative of residences on the western side of the
2 Project Area along Westfall Road; along Lutz Road in the middle of the Project Area; in
3 the southern portion of the Project Area along Swaney Road; and on the eastern edge of
4 the Project area along OH-104. Sound levels were continuously measured from May 22
5 through May 31, 2020 and one monitor, Monitor B, ran to June 2, 2020. During analysis,
6 sound level data was removed from the dataset to maintain integrity of the background
7 sound levels during the periods that would cause false sound level readings or artificially
8 high levels, such as wind speeds above 11 mph; precipitation and thunderstorm events;
9 anomalous events; or equipment interactions by RSG staff, other people, or animals.

10 **Q.7. What did the survey results indicate with respect to the sound levels that currently**
11 **exist in the area?**

12 **A.7.** Although there is a specific sound level limit for wind power projects within the
13 Ohio Administrative Code, there is not one for solar power projects. The design goal for
14 non-participating sensitive receptors used in this assessment of the Project is the measured
15 ambient sound level plus 5 dB for daytime and nighttime periods. Based on the background
16 sound monitoring conducted at the four monitor locations in the Project area, the average
17 existing daytime and nighttime equivalent continuous sound levels (Leq) in the area are
18 43.4 dBA and 37.6 dBA, respectively. This sets the daytime design goal at 48.4 dBA and
19 the nighttime design goal at 42.6 dBA.

20 **Q.8. What did your modeling results indicate with respect to the projected sound levels**
21 **when the Project is in operation?**

22 **A.8.** Sound propagation modeling was conducted at the 58 residences (49 non-
23 participating and 9 participating) throughout the Project Area, using the inverter with the

1 highest sound emissions and a substation transformer model that are representative of the
2 equipment that may be used for the Project. The modeling shows that all non-participating
3 residences are projected to be below the Project design goals. Notably, only 4 of the 49
4 non-participating residences were modeled to receive a sound pressure level of over 40
5 dBA with the highest being 42.1 dBA, which is within the Project's design goals.

6 **Q.9. Can mitigation be utilized in the event an operational noise issue developed?**

7 **A.9.** Yes. In the unlikely event an operational noise issue developed, noise barriers
8 could be strategically placed next to inverters to mitigate sound from propagating in
9 specific directions. Alternatively, some inverter manufacturers have additional noise
10 mitigation elements that could be installed to reduce the sound from specific inverters that
11 need it. While these mitigation options may be available, our assessment does not include
12 these elements as they were not necessary to meet the design goal of ambient sound levels
13 plus 5 dBA at non-participating receptors.

14 **Q.10. Are there any other potential noise sources associated with the Project?**

15 **A.10.** In addition to operational sound, a certain amount of unavoidable noise will be
16 generated during construction. Construction activities include road construction,
17 substation construction, trenching, inverter installation, piling, and racking. In any given
18 area, construction will be relatively short in duration, particularly for road construction,
19 trenching, piling, and racking. Construction equipment will be fitted with exhaust systems
20 and mufflers to reduce exhaust noise. In addition, the material staging areas will be located

1 away from sensitive receptors when feasible. To the extent possible, circular vehicular
2 movements will be established to minimize the use of back alarms.

3 Condition 14 of the Joint Stipulation provides further mitigation of construction noise.
4 Condition 14 requires that construction involving increasing sound above ambient levels
5 take place during daytime between 7 AM and 7 PM or dusk, whichever is later. Condition
6 14 also limits impact pile driving to the hours of 9 AM to 7 PM, or until dusk when sunset
7 occurs after 7 PM. Impact pile driving may occur between 7 AM and 9 AM if the noise
8 impact at non-participating receptors is not greater than the daytime ambient Leq plus 10
9 dBA. Hoe ram operations, if required, shall be limited to the hours between 10 AM and 4
10 PM, Monday through Friday. Condition 14 also requires notice to adjacent landowners of
11 upcoming construction activities.

12 **Q.11. Have you reviewed the November 30, 2020 Staff Report of Investigation in this**
13 **proceeding?**

14 **A.11.** Yes. I have reviewed portions of the report relevant to noise.

15 **Q.12. Did you review the section on Noise in the Staff Report of Investigation, including**
16 **Staff's expressed concern that one noise monitoring location, Monitor D, was not**
17 **representative of a significant amount of the Project Area?**

18 **A.12.** Yes, I reviewed that concern and Staff's recommendation that Monitor D be
19 dropped from the Project Area Leq calculation. Condition 16 of the Joint Stipulation
20 reflects that drop by utilizing a Project Area average daytime ambient Leq of 41.3 dBA.

21 **Q.13 How did you select the location for Monitor D?**

22 **A.13.** I selected the areas of representative soundscapes in which we should do monitoring
23 throughout the project area, and then I worked with the applicant to identify specific

1 locations where we could gain site access. Each location was selected as representative of
 2 a given landscape or soundscape experienced by sensitive receptors in and around the
 3 Project area. We typically consider factors such as land use, road traffic, distance to
 4 roadways, population density, and distance to geographic features (rivers, relative
 5 elevation, ground cover, etc.). Consideration is also given to security of the monitoring
 6 equipment. In this case, the factors that affect the soundscape in the Project area are not
 7 too complex and the monitor location decisions were primarily driven by the location of
 8 the sensitive receptors and roadways. The distance a monitor is placed from a roadway is
 9 determined by the setback distance of sensitive receptors along the roadway. That is,
 10 monitors are placed at a setback distance similar to nearby sensitive receptors. The
 11 characteristics that are represented at each monitor location that played a role in monitor
 12 location selection are listed in the Table below:

Monitor	Factors for Selection	Distance to Nearest Road
A	-Western extent of the Project area.	246 feet
	-Near the proposed substation.	
	-Setback from local road, comparable to setback distances for residences along local road.	
	-Nearest road classified as “local” by ODOT.	
B	-Middle of the Project area.	295 feet
	-Setback from local road, comparable to setback distances for residences along local road.	
	-Nearest road classified as “local” by ODOT.	
C	-Southern portion of the Project area.	147 feet
	-Setback from local road, comparable to setback distances for residences along local road.	
	-Nearest road classified as “local” by ODOT.	
D	-Eastern extent of the Project area.	98 feet
	-Setback from major collector road, comparable to setback distances for residences along major collector road.	

Monitor	Factors for Selection	Distance to Nearest Road
	-Nearest road classified as “major collector” by ODOT.	

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Q.14. Do you believe Monitor D is representative of a significant amount of the Project area?

A.14. Monitor D is representative of the Eastern extent of the project area. Most of the roads that run through and adjacent to the Project area are local roads. The exceptions are Williamsport Pike which runs along the southern extent of the Project area and is classified as a “Minor Collector” road by ODOT, and OH-104 along the eastern extent of the Project area which is classified as a “Major Collector” road by ODOT. Of the 58 sensitive receptors included in the study, Monitor D is representative of 14 of those receptors which are either located on or near OH-104. That is 24% of the modeled receptors, and Monitor D represents 25% of the monitor locations given that there were a total of 4 monitors. All of the other monitors were located along roads that are classified as “local” by ODOT.

Q.15. Are you supportive of using a Project Area average daytime ambient Leq of 41.3 in Condition 16 of the Joint Stipulation rather than your calculated Leq of 43.4 dBA?

A.15. While I believe RSG’s approach in placing monitors to determine the Project Area average ambient levels was appropriate and correct, I am supportive of Condition 16 because it represents a negotiated solution to Staff’s concern and is part of the overall negotiated Joint Stipulation. The condition provides for sound modeling of the final inverter and transformer(s) selected for the Project and regardless whether an Leq level of 41.3 dBA or 43.4 dBA is utilized in the condition, I expect the Project modeling

1 to show that sound levels from the Project will not exceed the noise standard in Condition
2 16.

3 **Q.16. What are your overall conclusions regarding the potential noise impacts of the**
4 **Project?**

5 **A.16.** Sound emissions from photovoltaic projects are typically less than other power
6 generation projects. In addition, most sound sources associated with solar power typically
7 only produce sound during the day when the possibility of disturbance is less likely. Based
8 on the survey of the existing environmental sound levels in the vicinity of the proposed
9 Project area and conservative projections of the Project's future sound emissions,
10 operational sound from the Project whether created during the day or night should not result
11 in excess of the design goal of existing ambient sound levels plus five dBA. And as I noted
12 above, mitigation to inverters can be implemented in the unlikely event an operational
13 noise issue develops.

14 **Q.17. Does this conclude your direct testimony?**

15 **A.17.** Yes, it does.

CERTIFICATE OF SERVICE

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Summary: Testimony Direct Testimony of Eddie Duncan electronically filed by Ms. Anna Sanyal on behalf of Yellowbud Solar, LLC