

March 31, 2020

Donnie Rose
President
R. A. Yancey Lumber Corporation
6317 Rockfish Gap Turnpike
Crozet, VA 22932

Subject Additional Discussions of Albemarle County Noise Ordinance & Exemption Requests
Acentech Project No. 630191

Dear Mr. Rose:

In advance of the resubmission of the mill's special exception request to the county, your team has asked me to outline the county's noise ordinance and the process/limits being proposed in the request. The goal of this letter is to help everyone understand why some of the language in the request is included.

NOISE ORDINANCE REFRESHER

The Albemarle County code includes regulations for noise in chapter 18, section 4.18. The code includes some definitions, outlines the necessary equipment and measurement procedure, and sets the associated sound level limits. I have generally outlined these in the following subsections.

Definitions of Interest

- **Equivalent Sound Level (Leq)** – The average sound level over a period of time.
- **Sound Level Meter** – Instrument used for making sound level measurements, must meet ANSI Type II.
- **Acoustic Calibrator** – Instrument that measures the accuracy of a sound level meter.
- **Source Sound Level** – The equivalent sound level of the source being measured.
- **Ambient Sound Level** – The sound derived from all sound associated with a given environment.
- **Total Sound Level** – The equivalent sound level of the source and ambient sound.

Measurement Procedure

The county code outlines the procedure to make the total sound level and ambient sound level measurements. In general, it is as follows:

- Field calibrate the Type II sound level meter using an acoustic calibrator with valid lab calibration.
- A windscreen must be used and weather conditions should be calm and not rainy.
- The sound level meter should be configured to have a 5-minute measurement interval with an A-weighting filter applied.
- The sound level meter should be positioned 4-5 feet above the ground at the property line ("any point inside the nearest receiving zone boundary").
- **Total** sound level shall be measured at this location.

- **Ambient** sound is measured while the source sound is not operating or the source sound has little impact.
- Calculate **Source** sound level by removing ambient from the total sound level, where applicable.

As you can see, to calculate the source sound level (the sound level of the mill), you first measure the total sound level, then measure the ambient sound level, then “correct” the total sound level to remove ambient, and you’re left with the source sound level. Note that the county code process for removing ambient from the total sound level is as follows:

- Identify the **maximum** measured **ambient** sound level (if multiple 5-minute measurements were made).
- Identify the **minimum** measured **total** sound level (if multiple 5-minute measurements were made).
- Remove maximum ambient from minimum total sound level to determine **source** sound level.

Sound Level Limits

The **source** sound level limit set in the county code for rural and residential boundaries is 60 dBA during the day and 55 dBA at night.

CONCERNS

It may not be immediately apparent, but in some cases, the maximum measured ambient sound level may exceed the minimum measured total sound level. This is because the ambient sound may be controlled by transient noise sources, such as traffic passbys or other short duration noise that is unrelated to the source. As an example, refer to the January 24th measurements at the property boundary nearest the stem-loader at RT-250. Recall that consecutive 5-minute measurements were made over the course of 4 hours, including from 12:00 – 12:30PM when the mill is largely not operating and we can measure ambient sound. The following table shows the sound levels from these measurements that would be used following the county’s procedure. When ambient sound levels are above total sound levels, the source level cannot be calculated since it would mean that the source is actually removing sound.

Maximum 5-Min Ambient Sound Level	Minimum 5-Min Total Sound Level	Source Sound Level
77 dBA	73 dBA	Ambient > Total Cannot Calculate Source Sound Level

Separately, note that we cannot measure ambient sound at all measurement locations since the mill is in continuous operation during the day. However, these locations are generally unaffected by ambient sound anyway, likely making the source sound level similar to the total sound level.

SUGGESTED CHANGES TO PROCEDURE

We suggest that the procedure be updated slightly to be use typical 5-minute sound levels rather than the maximum and minimums outlined in the code. In this case, I am defining typical as the median of all the relevant 5-minute measurements. This change would help to avoid issues where the ambient sound level is higher than the total, as shown in the following table using the same dataset from January 24. In case there is any doubt, this is a stricter way of calculating the source sound level than the code requires.

Typical 5-Min Ambient Sound Level	Typical 5-Min Total Sound Level	Source Sound Level
74 dBA	79 dBA	77 dBA

We also suggest that other locations around your property, where ambient cannot accurately be measured, report the total sound level as the source sound level, since they are likely similar. If at some future date there is an increase in ambient sound, the procedure could be reassessed to require a plant shutdown for measurement of ambient sound.

EXCEPTIONS REQUEST

Our previous sound study, dated October 28, 2019, included measurements at 19 locations at or near the mill's property boundary. The supplemental study, dated January 24, 2020, made additional longer term measurements at two locations to better review the variability of sound levels at the two locations considered most impactful. I understand that you are using the sound levels found during these studies to guide the limits requested in your special exceptions request, and following the suggested changes to procedure outlined above.

I hope this provides you with the information you need at this time. If you have any questions, please contact me at 434-218-0759.

Sincerely,

Acentech Incorporated



Bill Yoder
Senior Staff Scientist