Cottrell CPO

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File # T3-2022-16220 Comments
Cottrell CPO
cottrellcpo@gmail.com
8/7/23

To Whom It May Concern:

The following will address MCC 39.7515 Land Use Approval Criteria, [A} is consistent with the character of the area and [F] will not create hazardous conditions.

The following is material to supplement Noise/Sound information presented in File # T3-2022-16220 - Comments, Exhibit H.31, Current Sound Measurements on Proposed Filtration Site dated 6-25-2023.

The following is presented to explain how an apparent slight increase in Sound Level dBA, is actually a significant increase in the sound heard by an individual. Using Application Exhibit A.172, Attachment B.1 Acoustic Baseline Measurement, sound measurement results of "existing median hourly daytime L_{50} sound levels at the site range between 41 dBA and 49 dBA and median nighttime L_{50} sound levels range between 38 dBA and 49 dBA."

PWB indicates that the above ranges are within the allowable Code limits of 60 dBA daytime and 50 dBA nighttime. However, let's look at the sound level increase a person would hear comparing the pre-construction ambient sound levels to the Code limits, that PWB say they will adhere to. And let's look also at the construction sound levels of construction equipment. The actual volume differences are much higher than what one would assume based solely on the numbers, as decibels are measured on a logarithmic scale not a linear one. The calculation to change from log values to linear scale is:

(linear power) = 10^(dBA/10) *

Every increase in 10 on the dBA scale is equivalent to a 10x increase in volume or sound level.[1]

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The following table summarizes the differences in these dBA values on a linear scale:

dBA [log scale]	Linear scale	Ratio to 41 dBA	Ratio to 49 dBA
41	12,589	100% or 1 times louder than 41 dBA	-----
49	79,432	631% or 6.3 times louder than 41 dBA	100% or 1 times louder than 49 dBA
50	100,000	794% or 7.9 times louder than 41 dBA	126% or 1.3 times louder than 49 dBA
60	1,000,000	8,000% or 79 times louder than 41 dBA	1,260% or 12.6 times louder than 49 dBA
80	100,000,000	794,000% or 7,940 times louder than 41 dBA	126,000% or 1,260 times louder than 49 dBA

You can see that the sound volume at 50 dBA is 7.9 times that of sound volume at 41 dBA, NOT ~1.2 times, as you might assume based solely on the numbers and our familiarity with linear scales.

Similarly, sound volume at 50 dBA is 1.3 times that of sound volume at 49 dBA, NOT ~1.02 times.

So even at their lowest projected noise values, 50 dBA, the plant will increase ambient sound in the area by 1.3 to 7.9 times over the current measured levels. This gets even worse if you look at PWB's higher 60 dBA projection, where the ambient sound in the area will increase by 12.6 to 79 times. It is clear that these sound increases are not consistent with the Character of the Area.

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Construction sound levels will be from 80 to over 100 dBA. According to a study by the National Institute for Occupational Safety and Health, a single bulldozer continuously emits approximately 104-109 dBA during operation [Spencer & Kolvalchik 2077]. While idling a single bulldozer emits 96 dBA.

And these levels will be throughout each workday for 5 to 7 years, and that could be for a 5 to 7 day work week. It is also clear that these construction sound increases present hearing hazards to the workers, but also those residents, farm and non-plant craft workers, shippers and suppliers that frequent the area.

Construction plans presented to a recent Portland City Council meeting, discussing the Budget, stated that two portable generators would be running continuously or almost so, for an estimated 6 months until PGE could get power to the property. Application Exhibit A.49, Appendix A: Equipment Sound Power Levels, showed a single generator, size unknown, when surrounded by an enclosure, to have a dBA of 75, and there will be two. This will far exceed the allowable 50 dBA night allowance.

Studies show that "the threshold value of construction noise that leads to sleep disturbance was found to be 52 dBA.[2] Again, not only will nightly values of 50 dBA be above our current ambient sound levels, but values 52 dBA and above will product hazardous health effects on those that cannot sleep at night.

Respectfully,
Cottrell CPO

References

1. https://www.quora.com/What-is-the-formula-for-converting-decibels-to-linear-units#:~:text=The%20formula%20for%20converting%20a,10%5E(dB%2F10)

2. Sun Y.T> Master's Thesis. Chang'an University; Xi'an, China: May, 2008. Study on the Annoyance Threshold of the Construction Noise.

Multnomah County

LUP Comments <lup-comments@multco.us>

Comments for T3-2022-16220

1 message

Cottrell CPO <cottrellcpo@gmail.com> Mon, Aug 7, 2023 at 10:31 AM
To: lup-comments@multco.us

Please see attached written comments regarding Portland Water Bureau's proposed project at Carpenter Lane.

Regards,
Cottrell CPO

Sound Impacts - Cottrell CPO.pdf
121K