



MEMORANDUM

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SUBJECT: Lam Research Tualatin Site – Comments on A Acoustics Noise Survey Report
CGA Proposal No. P25171

You have requested that Colin Gordon Associates (CGA) review and provide comments on a noise survey report prepared by A Acoustics,¹ as it relates to potential noise generated by the Lam Research campus in Tualatin, OR. The report, dated August 13, 2025, summarizes the results of noise measurements conducted on March 30, 2025 at a residence along SW Tualatin Rd., immediately to the north of the Lam Research campus.

The following is a summary of our comments on this report:

- The report indicates that A Acoustics visited the Deborah Anderson home at 10:00pm on March 30. Per the City of Tualatin Noise Ordinance requirements,² noise sources are permitted to generate no more than 50 dBA at the property line of properties normally used for sleeping between 10pm and 7am.
 - The Oregon DEQ noise regulations, which are referenced along with the City of Tualatin noise ordinance in the Tualatin Development Code (63.051), state that noise sources shall not generate L50 levels of more than 50 dBA, L10 levels of more than 55 dBA, and L1 levels of more than 60 dBA between 10pm and 7am.³ The different noise metrics referenced in the DEQ requirements are defined in the standard,⁴ and are discussed further below.
- The report includes details on the measurement instrumentation used for the survey, which appears to meet the requirements included in the City of Tualatin

¹ E. Lahav, "Evaluation of sound impact from the Lam Research plant at Deborah Anderson Home located on 11045 SW Tualatin Road Tualatin Oregon 97062," dated 13 August 2025 and submitted to Brett Hamilton.

² Section TMC 6-14-050 – Exceeding Decibel Level

³ As defined in OAR 340-035-0035.1.b, Table 8

⁴ Section 340-035-0015.59

Noise Ordinance Section TMC 6-14-110.2 – Evidence of Noise Violation. However, there are few details on the measurement methodologies used, including the integration time, overall measurement time, etc. These details are critical to interpretation of the results, as discussed below.

- The report includes no indication of the location on the property where the measurements were conducted, or whether measurements were conducted at a single fixed location or at multiple locations. There is also no indication of the overall duration of the measurement, although the report does note that periods of time when vehicles were present on SW Tualatin Road were removed from the data that was analyzed and recorded.
- The reported finding is that the “sound recorded was 52 dBA,” however there is no indication as to what noise metric is used to define this level. While the City of Tualatin ordinance does not include details on the specific metric to be utilized, it is generally standard practice to state the metric being utilized in any noise assessment – as the specific metric used can influence the noise level considerably.

The Oregon DEQ standards are defined in the form of statistical noise levels, or centile levels, which represent the noise levels that were exceeded for a certain percentage of the time during the measurement period. For a given measurement, the various centile levels will generally be quite different, due to the influence of transient noise sources. The DEQ requirements specifically reference the L1, L10, and L50 levels – which are the noise levels exceeded for 1%, 10%, and 50% of the measurement period.

- Another commonly used metric is the L90, which is the noise level exceeded for 90% of the time. This metric is commonly used to assess the contribution from noise sources that are present and stable throughout the measurement period – such as continuously operating mechanical equipment.
- Ordinances in many other municipalities are defined in terms of the maximum allowable L_{eq} , or equivalent energy noise level – which is defined as the constant noise level that would result in the same total sound energy produced by the measured time-varying noise over a given period of time. The L_{eq} levels can be quite sensitive to the impact from short term transient noises.

A range of 20 decibels or more across the different metrics discussed above is not uncommon for a given exterior measurement. Including the maximum level measured during the period (L_{max}) increases the range further – as this metric is highly sensitive to influence from very brief transients (as well as to the integration time used).

- An exterior noise measurement is necessarily impacted by a number of different noise sources. With the exception of traffic on SW Tualatin Rd., which the report notes was excluded from the data analyzed, there is no mention of what, if any, noise sources were present or audible on or around the property. The duration of the measurement and the noise metric used can help to identify the specific

source(s) of noise impacting the location. Some sources, likely including most mechanical sources associated with the Lam plant, are relatively continuous. Other noises may last only a matter of seconds or vary significantly over time.⁵ Centile metrics can be particularly useful in isolating the noise contribution from relatively continuous sources from noise generated by short-term transient events.

- Another method for determining the dominant noise sources is to evaluate the noise levels as a function of frequency. The report notes that “there was sound peak at 175 Hz and 350 Hz” but does not provide any further details or plots of the measured noise levels as a function of frequency. There are no details regarding the noise metric used, measurement duration, and no detailed plots or other results are provided that show the measured levels as a function of frequency.
 - The data is not presented in octave or one-third octave band format, and therefore comparison to the frequency-based requirements in the Oregon DEQ noise regulations,⁶ including evaluation of the measured levels for audible tonal content, is not possible with the information contained in the report.
- Both the City of Tualatin ordinance and DEQ standards also include limits on impulsive sound, along with subjective requirements for noise that could be considered disturbing. The report does not include any characterization of the noise at the measurement location.

In summary, while the report provided indicates that a noise level of 52 dBA was measured at the residential property, there is not sufficient detail included in the report to conclude that the measured level is fully attributable to noise coming from the Lam campus.

This concludes our report.

⁵ For example, a passing vehicle will generate progressively higher noise levels as it approaches the measurement location, with the levels gradually decreasing as the vehicle departs. The highest noise levels generated by the vehicle will likely occur over just a few seconds, however the vehicle could generate noise exceeding the background levels for a much longer duration.

⁶ 340-035-0035 Section 1.b.B.e