Attachment A

City of Billings Noise Ordinance Review

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Memo

To:	Brent Brooks, City Attorney's Office, City of Billings
From:	Dan Autenrieth, Safety, Health, and Industrial Hygiene Department, Montana Tech
Date:	August 12, 2018
Re:	City of Billings Noise Ordinance Review

Executive Summary

The purpose of this review was to provide my opinions and recommendations on the newly revised City of Billings noise ordinance and my general opinions on some noise issues that have been raised by members of the community. The opinions and recommendations provided within this report are based on my experience as an industrial hygienist and environmental health scientist; relevant national scientific standards; and on a comparison between the City of Billings noise ordinance and the ordinances from other communities in the state and region.

There are a number of positive and noteworthy aspects identified in the newly revised ordinance, including providing noise limits throughout the city, providing more stringent limits at night, providing exceptions for allowable activities, and providing a clear process for folks to occasionally and temporarily exceed the established noise limits for celebrations and special events. Some potential challenges identified include the use of noise limits that would be too high to protect the health and welfare of the public with an adequate margin of safety if noise exposures were sustained at or near the current limits.

My recommendations are detailed on pages six and seven of this report and they are listed here for reference:

1. Continue with plans to reduce the number of noise zones from four to three by combining light and heavy commercial into one zone.
2. Consider adding language clarifying noise will be measured away from the source on a public boundary or at the complainant's property boundary.
3. Consider adding language clarifying the noise measurement metric expressed by the established noise limits.
4. Consider adding language specifying that average, sustained noise levels should be kept 10 dBA below the established maximum noise limits in the ordinance.
5. Consider adding language specifying training for law enforcement officers responsible for measuring environmental noise levels, and that only noise measurements taken by trained law enforcement officers can be used to enforce the ordinance.
6. Consider removing items two and three from the "Measurement of Noise" ordinance section and including the training requirements for law enforcement officers recommended in #5 in their place.

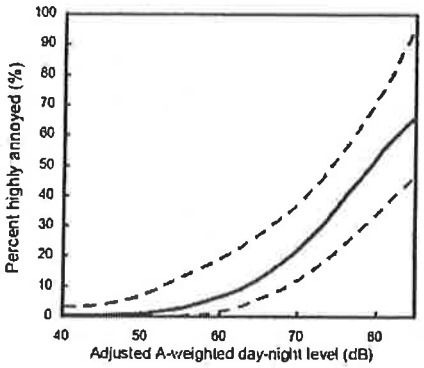
Background

Noise can be defined simply as sound that is unwanted or causes disturbance. Noise is ubiquitous in modern society and truly every living human and animal will produce noise. In general, noise can pose a health risk to humans if the exposure is loud enough and the exposure time is long enough. As the noise level increases, the acceptable exposure time decreases, and vice versa. Repeated and prolonged exposure to very loud noise can cause noise-induced hearing loss and increase the risk for cardiovascular health problems.[1] These very loud noise levels are common in many occupations, including among miners, loggers, and factory workers, but these levels are much less common in residential communities.[1] At lower noise levels, the risk of health problems are reduced but people can still be adversely affected by the noise. Annoyance, speech communication interference, and sleep disturbance are all possible at environmental noise levels below those necessary to cause hearing loss and heart problems.[1]

In 1981, the Environmental Protection Agency (EPA) declined to establish national environmental noise pollution limits under Title IV of the Clean Air Act.[2] As a result, the responsibility for regulating environmental noise has fallen to state and local governments. A drawback of the EPA's decision is that there is now a patchwork of regulations around the country, which can be challenging for businesses operating in many different communities. The upside, however, is that local communities can decide for themselves how lax or stringent they wish to be regarding environmental noise. Ultimately, a local community noise ordinance should reflect the community's will expressed indirectly through their local elected officials. As communities change and environmental noise problems arise, the local community noise ordinance should be revised as needed to ensure the ordinance continues to reflect the will of the people and meet the needs of the community's citizens.

This patchwork of local noise ordinances means that the level of acceptable noise varies depending on where you are and who you ask. Fortunately, there are scientific standards available to help us identify a generally acceptable level. In 1974, the EPA recommended a 24-hour long-term average day-night noise level limit for residential areas of 55 dBA to "protect the public health and welfare with an adequate margin of safety".[3] Though dated, the EPA's recommended level is consistent with many modern scientific standards, including the current American national standard for sound levels and their compatible land uses. This standard (ANSI S12.9, Part 5) considers long-term average day-night noise levels up to 55 dBA as compatible with all residential land-use categories.[4] They go further to list compatible noise levels for many other types of land use, including for commercial (up to 65 dBA is compatible), and industrial areas (up to 70 dBA is compatible).[4] Again, these levels represent a special metric of long-term average day-night noise levels, which imply that some periods of time above these levels are acceptable provided that the average remains at or below the recommended level.

Another challenge with finding a generally acceptable level is the fact that people have differing levels of sensitivity to noise. Some people are rather sturdy to environmental noise, rarely seeming to become irritated in the presence of high noise levels, while others will become quite distressed in the presence of relatively modest environmental noise. The following figure illustrates the average percent of people expected to be "highly annoyed" when exposed to different long-term average day-night noise levels



(solid line), and the dotted lines indicate the approximate 10% and 90% ranges for these responses at each noise exposure level.[5] Clearly, there is quite a range of human sensitivities and tolerances to environmental noise.

National scientific standards often do not include feasibility in their consideration nor do they normally consider economic, social, or political factors related to their recommendations. A community noise ordinance must not only protect human health, but also balance the need to protect peoples' right to peaceful enjoyment of their property with the rights of people and organizations to produce noise as a byproduct of the normal use and enjoyment of their own property, including maintaining or improving property, conducting business, attracting customers, celebrating, and more. Thus, a review of how other communities regulate environmental noise is useful in addition to referencing national standards.

The purpose of this project was to provide a review of the current City of Billings noise ordinance, along with some proposed changes to the ordinance, and to comment on some outstanding issues brought forth by members of the community.

Methods

My review was conducted in late spring and early summer of 2018. The City of Billings noise ordinance I reviewed was current as of May 8, 2018 and I also reviewed the amendment adopted on May 29, 2018. National scientific standards were consulted as were the noise ordinances from the five next-largest Montana cities and five additional comparison cities from the surrounding region. The goal for selecting regional cities was to capture a range of cities from surrounding states similar to the City of Billings in terms of population, with some above and some below the population of Billings. The Montana cities reviewed were Bozeman, Butte, Great Falls, Helena, and Missoula. The five regional cities were Spokane, WA; Nampa, ID; Ogden, UT; Fort Collins, CO; and Sioux Falls, SD. There were four primary focus areas for the ordinance review and comparison with other cities. They were:

- Noise limits
- Methods for measuring noise
- Methods for enforcement of the ordinance
- Provisions for non-exempt noise ordinance permits or waivers

Two of the communities reviewed (Bozeman, MT and Nampa, ID) have adopted nuisance noise ordinances, which do not specify noise limits, noise measurement, enforcement, etc. Typically, compliance for these types of laws is assessed using the impression of two independent listeners regarding the acceptability of the noise. An additional Montana community reviewed (Butte) had proposed and considered adopting a comprehensive noise ordinance, but ultimately it was not enacted. In this case, the proposed standard was considered in my review. All of the other comparison cities had adopted limit-based ordinances similar to the City of Billings.

Findings

Noise limits

The noise limits specified in the current version of the City of Billings ordinance are provided in Table 1. In general, these levels are higher than the long-term average day-night noise levels recommended in the national scientific standards for residential, commercial, and industrial zones. However, the current City of Billings noise ordinance language is ambiguous regarding whether the limits are absolute noise limits or average noise limits.

As a comparison, the current City of Billings noise limits are generally as high or higher than every other city considered in the review for all residential, most commercial, and all industrial zones. A comparison of ordinance noise limits is also provided in Table 1. Note that some comparison cities use additional zones not included in the Table 1, including public zones (for public gathering places), and sensitive zones (schools, hospitals, etc.).

Table 1: Current City of Billings Noise Limits as Compared to Selected State and Regional Ordinances

Zone	City of Billings		Comparison Cities [A, B, C, D, E]	
	Day	Night	Day (average, range)	Night (average, range)
Residential	65 dBA	55 dBA	56.3 dBA, 55-60 dBA	50.0 dBA, 45-55 dBA
Light Commercial	80 dBA	60 dBA	64.4 dBA, 70-60 dBA	58.4 dBA, 55-65 dBA
Heavy Commercial	85 dBA	70 dBA		
Industrial	90 dBA	80 dBA	78.1 dBA, 70-80 dBA	70.0 dBA, 60-75 dBA

[A] *Comparison cities included Bozeman, MT; Butte, MT; Great Falls, MT; Helena, MT; Missoula, MT; Spokane, WA; Nampa, ID; Ogden, UT; Fort Collins, CO; and Sioux Falls, SD*

[B] *Missoula's ordinance includes noise limits for an evening period, which were not included in the averaging*

[C] *For cities with a range of acceptable noise limits per zone, the lower of the range was included for residential zone averaging, and the higher was included for commercial and industrial zone averaging*

[D] *Many cities do not specify light and heavy commercial, and some specify light and heavy industrial, so these zones were combined for averaging*

[E] *Each city's individual noise limits are provided in Appendix A*

Methods for Measuring Noise

Along with established noise limits comes the need to measure environmental noise. The current City of Billings noise ordinance specifies three noise measurement noise measurement criteria: frequency weighting, location, and background noise. The frequency weighting specified is A-weighting. In short, A-weighting adjusts noise measurements so that the sound level meter "hears" roughly the same frequency ranges and intensities as the human ear. The use of A-weighting is consistent with national scientific standards as well as the other ordinances reviewed.

Measurement location is more difficult to assess. From a scientific perspective, the best location for environmental noise measurements varies greatly depending on the characteristics of the noise source

and the environment, as well as the purpose of the measurements themselves. There was also a variety of measurement location specifications in the selected comparison ordinances. The current City of Billings ordinance specifies noise measurements be taken either 25 feet from the source or the "boundary of the lot", whichever is further. It is implied that it is the source owner's property boundary, as noise "radiating from properties..." may not exceed the established limits. Of the communities that specify noise measurement distances, three of 10 include virtually identical measurement locations to the current City of Billings noise ordinance, one of 10 states only that the location should be at the boundary of the lot, three of 10 state the measurement location is the boundary of the receiving property (which implies the complainant's property), and three of 10 do not specify measurements or locations. Practically speaking, the location should be one that is consistent and easy to apply in the field.

The current City of Billings noise ordinance also specifies that the source noise must be 10 dBA or more above background noise. There is a scientific basis for this type of language. If the background (or "ambient") noise level without the noise source in question is lower but within approximately 10 dBA of the noise source, then the measured source noise level including background noise should be adjusted downward to fairly quantify the noise being generated by the source. Similarly, if the background noise is greater than the noise source itself, the noise source level cannot be easily quantified. Five of 10 other reviewed ordinances use similar language including background noise levels or providing adjustments for the background noise levels. In contrast, two of 10 comparison cities address the issue indirectly by listening for a clearly audible source noise, while three of 10 others do not address the issue at all. Practically speaking, the process of isolating the background noise level from overall ambient noise measurements is likely not feasible for law enforcement officers.

Methods of Enforcement of the Ordinance

The City of Billings, like most cities included in this review, assigns law enforcement officers the responsibility to enforce their noise ordinance. This is important for a three reasons. First, the process of measuring environmental noise is difficult and highly technical. Normally, the individuals with substantial education, training, and experience in taking noise measurements are engineers, industrial hygienists, and environmental health and safety professionals. However, budgetary and logistical restraints generally prevent all but rather large metropolitan areas from utilizing these professionals to enforce noise ordinances. That is not to say others cannot be trained in these methods, but it does require that the methods prescribed are feasible for individuals with limited education, training, and practice in taking these kinds of measurements.

Second, noise ordinance enforcement is but a very small fraction of the many important responsibilities of law enforcement officers. Given this, the methods used to assess compliance and enforce the ordinance must be expedient. Furthermore, noise complaints are often just a part of a dispute between neighbors and thus the enforcement process should be flexible enough to allow law enforcement officers the leeway necessary to settle disputes in the field whenever possible.

Provisions for Non-Exempt Noise Ordinance Permits or Waivers

Beyond the typical exemptions for allowable activities and prohibitions on activities that are never allowed, most of the comparison noise ordinances include provisions for some sort of relief permit or waiver from the noise limits and day/night time restrictions. Four of the 10 reviewed ordinances had general allowances for noise and time limit relief, while another four of 10 had waivers only in cases of "hardship" resulting from the ordinance. These were generally written as to imply compliance relief with a new/revised ordinance for time periods of up to one year (presumably from the date the ordinance was enacted/revised), rather than more general permits for events, etc. Two of the 10 comparison ordinances had no provisions at all for waivers or permits. The current City of Billings noise ordinance includes unique provisions for requesting permits to allow for temporary, occasional exceedance of the noise ordinance rules up to four times per location per calendar year. None of the comparison ordinances had any apparent restrictions on the number of permits or waivers. Provisions for permits or waivers were not addressed specifically in the national scientific standards consulted for this project, but such standards are based on long-term average noise levels rather than temporary, occasional exposures, so such provisions are not necessarily at odds with the standards. Further, limits on the number of permits per location could be helpful in minimizing the impact of loud but permitted noise on individuals in any particular location.

Review Recommendations

The review revealed that there are a number of strong points in the current City of Billings noise ordinance and that there are also some areas that could be improved. Based on the findings of the review, I would like to offer the following six detailed recommendations to the City Council.

1. **Continue with plans to reduce the number of noise zones from four to three by combining light and heavy commercial into one zone.** The national standard for long-term land use compatibility planning (ANSI S12.9, Part 5) does not specify which zones, if any should be included in a noise ordinance, but the standard does provide compatible long-term average noise level ranges for a number of different land uses.[4] The current four noise zone categories in the City of Billing noise ordinance match the ordinance from Great Falls, MT (one of 10 comparison ordinances) in separating out light and heavy commercial, while three of 10 other comparison ordinances specify only residential, commercial, and industrial. One of 10 comparison ordinances specifies four zones with both light and heavy industrial zones, and the other five of 10 either add additional, unique noise zones or do not specify noise zones at all. I also do not think that it is reasonable for law enforcement officers responsible for enforcing the City of Billings noise ordinance to differentiate between light and heavy commercial areas. I recommend utilizing the established light commercial zone noise limits for the commercial zone noise limits. The relevant section is "Noise Limitations" (17-103).

2. **Consider adding language clarifying noise will be measured away from the source on a public boundary or at the complainant's property boundary.** The current language is ambiguous regarding the measurement locations, but it is implied that the source owner's property is the boundary. Twenty-five feet or more away from the source in the nearest public boundary is a reasonable place for an officer to setup and take measurements, whereas 25 feet from the source (not on a public boundary) may put the officer in the middle of the source owner's property and/or in potentially unfavorable noise measurement conditions. In addition, if the complainant's property is situated away from the source by a substantial distance, it does not seem correct to measure noise related to that complaint on the source owner's property boundary because the complainant is not experiencing noise there. Three of 10 other ordinances use language indicating the receiving (complainant's) property line, and most environmental noise texts use the noise level entering the homeowner's parcel when selecting a measurement location. In my experience with environmental noise, it is the receiving property line where noise levels are normally measured.

   In cases where the complainant's property line is closer than 25 feet from a noise source, it is recommended that the 25 feet or more in the public boundary specification be used. The purpose for this minimum distance recommendation is not to dilute the noise level entering a complainant's property. Rather, the recommendation is necessary to help ensure accurate noise measurements. Noise produced by a source should be measured in the "far-field" because the behavior of soundwaves is not easily predicted close to a noise source.[6] The distance away from the source where the far-field begins depends on the dimensions of the source as well as the predominant frequencies of the noise being produced. As a rule of thumb, 25 feet should be sufficient to reach the far field for most sources and most frequencies relevant to human hearing. Beyond keeping law enforcement off of people's property, the specification of a public boundary allows for noise measurement setup on either a sidewalk or road where the likelihood of obstructing obstacles and problematic ground cover is reduced. The relevant section for this recommendation is "Noise Limitations" (17-103).

3. **Consider adding language clarifying the noise measurement metric expressed by the established noise limits.** Specifically, I think the established noise limits are too high if interpreted as average noise levels, and I recommend specifying that these are maximum noise levels (LAS_{max}, which is the highest one-second A-weighted average noise level over the measurement period). The relevant section is "Noise Limitations" (17-103). This metric, if adopted, this metric should also be defined in the "Definitions" section (17-101).

4. **Consider adding language specifying that average, sustained continuous or intermittent noise levels should be kept 10 dBA below the established maximum noise limits in the ordinance.** This recommended change will eliminate the ambiguity between what is an acceptable maximum noise level, and what is an acceptable average noise level. Further, this change is needed to protect people from disturbance closer to the noise level recommendations provided in national scientific standards and the noise ordinance limits established in other cities. The metric used to quantify the average noise level should be the average equivalent A-weighted sound pressure level (LAS_{eq}). This

metric is common and most sound level meters are capable of producing this measure. The relevant section is "Noise Limitations" (17-103). The LAS_{eq} should also be added to the "Definitions" section (17-101).

5. **Consider adding language specifying training for law enforcement officers responsible for measuring environmental noise levels, and that only noise measurements taken by trained law enforcement officers can be used to enforce the ordinance.** Because taking accurate noise measurements is a complex process, I recommend establishing some form of sustainable training program on proper environmental noise measurement techniques and on the provisions of the noise ordinance. Only officers who have completed the training should be permitted to take environmental noise measurements. This recommendation also addresses the tendency for property owners to buy their own meters (or use smartphone applications) to measure the noise themselves. While nothing in this recommendation would preclude a person from doing that, the quality or their techniques or equipment cannot be verified and thus only measures taken by City of Billings law enforcement officers who have received the training should be relied upon for enforcement purposes. This recommendation applies regardless if any other recommendations detailed in this report are adopted.

6. **Consider removing items two and three from the "Measurement of Noise" ordinance section and including the training requirements for law enforcement officers recommended in #5 in their place.** The requirements for ensuring the source is at least 10 dBA greater than the background noise level are problematic because the process for isolating a source from the background noise accurately can be challenging and and may involve specialized equipment or resources. There are ways to statistically estimate the background noise level when isolation is not possible or practical, and some meters are capable of producing the necessary measures. However, because the procedure to do so varies by meter and it may not be possible with current equipment, I recommend striking this language and addressing it in the training.

I would also like to offer an additional item to consider, although I am not calling it a formal recommendation because the idea doesn't stem directly from the standards and ordinances reviewed. In short, I would offer that the City Council may wish to include language clarifying that law enforcement officers have wide latitude when responding to noise complaints to either act as necessary to stop disturbances of the peace without the need for noise monitoring and/or to seek out voluntary, on-site noise abatement from the involved parties without the need for a formal noise monitoring or enforcement actions. While I do think it is important that noise monitoring equipment and trained officers be available to respond with formal noise monitoring if needed, I think it would be unreasonable to allow a clearly evident disturbance to proceed while waiting for said equipment and officers to arrive and formally measure the noise problem. Likewise, I think if the involved parties are willing to immediately resolve the issue on-site with the responding officer, there is probably little need for mobilizing those same resources unless additional complaints are registered.

Other Environmental Noise Questions

In addition to the ordinance review, I was also asked to share my my opinions on several noise issues brought before the City Council in the past year or so. I should note I've received limited information on these issues, mostly in the form of City Council meeting notes. Here are my preliminary thoughts on these issues in no particular order:

- **Moving the noise limit daytime start from 7:00 AM to 8:00 AM** – The national scientific standards reviewed did not offer any specifically preferable daytime start time. In several cases, the EPA's "Model Community Noise Ordinance" provides only blanks for each community to specify their own daytime and nighttime intervals.[7] Of the other community ordinances reviewed, the typical daytime start time was 7:00 AM in six of 10 comparison communities, while three of 10 used 6:00 AM start times, and one of 10 (Great Falls) used an 8:00 AM start time. While I understand and appreciate the desire to sleep in a bit longer, there are practical problems associated with moving the daytime start time later, especially if it is beyond the time where normal commuting typically begins. If a substantial portion of folks are already packing up, taking out trash, and otherwise making noise heading onto the road to work or school before 8:00 AM, the likelihood for noise will increase. Given the current times are equal or later than nine of the 10 comparison communities detailed in my report, I am not sure my review results justify moving the daytime window to 8:00 AM. That said, it is worth noting that the City of Billings noise ordinance daytime window used to start at 8:00 AM until a revision in 2013.

- **Using 45 dBA as a residential noise limit at night** – As a maximum level expressed in the current City of Billings noise ordinance, this level is too low and it would probably be very difficult to comply with. For reference, 45 dB is about average the level of a small bird chirping, 40 dB is the average level of a refrigerator running, and 50 dBA is in the range for a normal indoor conversation. Going a whole night without momentarily exceeding that level would be very hard if you were doing virtually anything (getting in and out of a car, taking out the trash, etc.). As an average level, this recommendation is still at the lower end of national scientific standards I reviewed and it is also lower than all but one (Spokane, WA) of the other comparison communities reviewed. Furthermore, I'm not aware of any any standards or major studies that have found that noise levels ranging from 45 dBA to 55 dBA cause health problems such as cardiovascular problems or hearing loss, although 45 dBA as a long-term average "inside the home" was a part of EPA's recommendations. The problem with applying an ordinance inside of buildings is the introduction of interior noise sources and the varying levels of sound mitigation in different buildings. All that said, I do feel that the current residential limits of 65 dBA for daytime and 55 dBA for nighttime are too high if interpreted as average, sustained sound levels, and I therefore have recommended that they lower these by 10 dBA when considering average noise levels as opposed to maximum noise levels. A comment was also made that street noise is often in excess of this noise level. This can indeed be true and I would add this can be true of a maximum or average limit if the location is near a busy thoroughfare. However, road noise typically consists of many sources traveling along the road and, while not

specifically exempt, it does not appear that noise from general traffic would be enforceable under the current City of Billings noise ordinance.

- **Noise from emergency generators** – Not much detail is given about these generators, but I think this issue is already covered by the standard. If the emergency generators are being used in an emergency, powering a home during a power outage for example, then their use would seem to be exempt under the current ordinance. If used in routine, non-emergency work, they would not be exempt unless they were being used in other exempted activities, such as building or grounds repair/construction during the day, road or other municipal work, or any other construction with a waiver. It is my understanding that if their use is not exempted/permitted, and they were generating noise levels above the adopted limits, their use would constitute a violation. It is worth noting that while there are a few products with noise emissions limits, such as portable air compressors, most products including generators do not have a legal noise emissions limit from a product safety perspective.

- **Noise from outdoor air handling equipment** – This is similar to to the previous issue in that not much information is given. In industrial settings, air handling equipment is needed to transport and remove contaminants from the indoor air. In residential and commercial settings, temperature control and comfort are the primary purposes. Unlike emergency generators, it seems as though outdoor HVAC systems would not generally be exempted from the ordinance, and so I think the normal noise limits would be used to assess compliance with the ordinance. I think the current ordinance covers this situation fairly well. Areas where homes are built very close together (or where they are touching) are more likely to have these sorts of issues. TV noise, radio noise, etc., moving from one house to the other through open windows is also common in these situations.

- **Highly variable sound from HVAC cycling or similar** - Highly variable sound has been demonstrated to be more irritating than steady sound given an equivalent noise level.[8] It is easier for humans to tune out a constant drone than it is to tune something out that is starting and stopping a number of times. There are environmental noise metrics that account for this, including the so-called noise pollution level (NPL), but none of the comparison ordinances utilized this metric. One (Sioux Falls, SD) did have a provision to reduce the noise limits by 5 dBA if the noise was "cyclical". The proposed average sound level metric (LAS_{eq}) can only be fairly quantified in a short duration measurement (such as those taken by law enforcement officers) if the sound is relatively "steady-state". Steady-state noise can be defined as noise that does not generally vary by more than +/- 5 dBA. The recommended training for law enforcement officers should include procedures for officers to quickly determine if the sound is steady-state or not to determine if the 10 dB reduction for average, sustained noise level can be applied. Given the technical nature of this procedure, and that the procedure will be different depending on the meter used, I would not recommend adding such language to the ordinance and instead address the need to fairly quantify the noise level in the recommended training. Fairly quantifying cyclical, intermittent, or highly variable noise, including

through the use of a NPL metric, requires additional time and measurements than would be reasonable for law enforcement officers responding to noise complaints.

- **Environmental noise in the summer months** - Summer months are always challenging because they elicit outdoor activities that generate noise while more people are sleeping with the windows open, which reduces building noise attenuation. Winter months are the opposite, with fewer folks outside, shorter days, and buttoned-up windows and doors. The national scientific standards I've referenced in my report utilize a long-term average day-night noise level that incorporates the lows of winter and the highs of summer, but the measurement is difficult and costly to obtain. This metric would not be feasible for law enforcement officers to measure. One good thing about living in Montana is that the quiet winter or winter-like months are probably a lot longer than in many other parts of the country.

- **Is 10:00 PM too late for permits?** – 10:00 PM is actually a common nighttime start point in the reviewed ordinances in general without permits or waivers. Four of 10 ordinances used 10:00 PM for the nighttime start, three of 10 ordinances used 8:00 PM, two used 11:00 PM, and one used 10:30 PM (Sioux Falls, SD). The average of those 10 comparison ordinances would be about 9:30 PM. The current City of Billings 8:00 PM nighttime start time is as early or earlier than all other reviewed ordinances. Given the community has already accepted this, I wouldn't necessarily advocate for moving it back. However, I would certainly think 10:00 PM stop times (or later) are reasonable for special event permits, given these permits are limited to four per calendar year per location and that the summer daylight hours often extend almost to 10:00 PM.

- **Bands playing in a restaurant parking lot** - It should first be established if the location of concern is a commercial or residential district. Per the current City of Billings noise ordinance, at locations on the border between two zones, the more protective zone rules (and I should add many other ordinances have this). Regardless of the zone, the prevailing noise standard should apply without a permit. A rock band with amplification equipment can produce noise levels at the source in excess of 100 dBA, so I would think a noise violation would be possible at a residence 400 feet from the source. However, there are a lot of factors in this situation we don't know regarding the source itself and the propagation of sound from the source to the listener, so estimating a sound level at the residence without more data is impossible – measurement is needed here. If a permit was issued, then the establishment has received permission to exceed the noise ordinance on those particular nights and the resident would hopefully be happy that such disturbances would be limited to four nights per year, as opposed to every week or twice per week throughout the summer, as stated. This particular circumstance seems to be covered by the existing ordinance language. There was also a comment about perhaps limiting permits so that permitted exceedance days were not consecutive. I support this idea in general, to minimize sleep disturbance to only a single evening at a time, but I do worry if this would be feasible given permits may be sought for special events that normally last a weekend or longer. It is also worth noting that individuals who live in commercial or industrial zones may well be exposed to higher noise levels, but the science suggests that these

people tend to also tolerate higher noise levels generally than do people who live in residential zones.[8]

- **Regarding stadium noise from music during practice** – There is a good deal of variability regarding the noise stadiums or similar venues can produce in established noise ordinances. Depending on the situation and zoning, music played in a stadium in the City of Billings during games/practice could potentially exceed either the commercial or residential zoning noise limits (depending on which was applicable) at adjacent property lines. However, there is an exemption in the current City of Billings noise ordinance for stadiums that does not specify the type of activity in the stadium (practice versus games, football versus band practice, etc.). I read the ordinance as "permitted events held in stadiums or parks for which a waiver has been granted [are exempt from the noise level regulations]". I think it is probably beneficial for the school and community to use the stadium both for practice and to host events, and given these activities will generate noise, I'm not sure removing the ordinance exemption is something I'd recommend. However, it is worth noting that noise generated by music during practice should be fairly easy to control. Transitioning off of the scoreboard sound system with elevated, powerful speakers designed to propagate loud music over considerable distances to a portable stereo on the practice field would probably go a long ways at reducing disturbance to the community. I would also add that I'm not sure why the ordinance exemption states the stadium would need a waiver, as sports events would normally be expected in a stadium as opposed to a business interested in hosting an occasional special event. I would also think games/band competitions/practice/other events would exceed four events per calendar year.

  During my ordinance review, I received an email informing me that the high school/district and the community around the high school stadium have been working together amicably and that the school has proposed a "good neighbor policy" to address community noise concerns. I think this is excellent and it represents exactly how I would hope more people would behave during noise disputes. The community organized and communicated their concerns, the school took the complaints seriously and responded with a proposal, and the community seems open to the proposed solution. This is wonderful because no noise ordinance can ever be all things to all people. Disputes can and will arise and with good attitudes and openness they can be resolved. I have been involved with civil litigation cases related to environmental noise disputes and they can be messy, expensive, and lead to unsatisfying outcomes. I highly recommend that people strive to be good neighbors and work things out among themselves and I commend the parties involved with the stadium noise dispute.

Conclusion

I hope my review and comments prove helpful for the City Council and any other interested parties wishing to understand how the current City of Billings noise ordinance stacks up with national scientific standards and the noise ordinances from other communities in the state and region. It is my professional opinion that the six recommendations detailed in my report will improve the ordinance for those living and conducting business within the city and for those individuals tasked with enforcing the

ordinance. I am happy to help the City of Billings develop training for law enforcement officers responsible for taking noise measurements and in drafting potential ordinance language should any of the recommendations contained within this report be adopted.

Prepared by:

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References:

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Appendix A: Established Noise Limits from Comparison City Ordinances

Bozeman: N/A, This city has a nuisance ordinance

Butte: These were the proposed noise limits in this city

Zone	Day	Night
Residential	55 dBA	50 dBA
Commercial	65 dBA	60 dBA
Industrial	80 dBA	75 dBA

Great Falls: This city has enacted these noise limits

Zone	Day	Night
Residential	55 dBA	50 dBA
Light Commercial	65 dBA	60 dBA
Heavy Commercial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

Helena: This city has enacted these noise limits

Zone	Day	Night
Residential	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Industrial	80 dBA	75 dBA

Missoula: This city has enacted these noise limits

Zone	Day	Evening	Night
Residential	60 dBA	55 dBA	50 dBA
Commercial	65 dBA	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA	60 dBA
Heavy Industrial	80 dBA	75 dBA	70 dBA

Spokane, WA: This city has enacted these noise limits, depending on the source and receiving land use

Zone	Day	Night
Residential	55-60 dBA	45-50 dBA
Commercial	57-65 dBA	57-65 dBA
Industrial	60-70 dBA	60-70 dBA

Nampa, ID: N/A, This city has a nuisance ordinance

Ogden, UT: This city has enacted these noise limits

Zone	Day	Night
Residential	55 dBA	50 dBA
Commercial	65 dBA	60 dBA
Industrial	80 dBA	75 dBA
Public	75 dBA	70 dBA

Fort Collins, CO: This city has enacted these noise limits

Zone	Day	Night
Residential	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Industrial	80 dBA	75 dBA
Employment	70 dBA	65 dBA

Sioux Falls, SD: This city has enacted these noise limits

Zone	Day	Night
Residential	60 dBA	55 dBA
Commercial	65 dBA	65 dBA
Industrial	75 dBA	75 dBA
Agricultural	75 dBA	55 dBA
Noise Sensitive Zones	60 dBA	50 dBA