Before:

2.2 What is noise and why does it bother us?

A familiar riddle asks *"When a tree falls in forest with no one about, does it make any sound?"*. From our experience we would expect that such a falling tree would indeed create pressure fluctuations in the air, and therefore, given the definition provided above, it would clearly create sound. However, interpreting a particular sound as "noise" involves a personal judgment that depends on the sensitivity, attitudes and past experience of the listener. What is music to one person's ears (e.g., a Wagner opera or a Harley Davidson at full throttle) may be noise to another's. However, noise is often defined as "***unwanted sound"*** and there are some aspects of sound which tend to make it more likely to be unwanted. This may be because the sound has undesirable characteristics like pure tones (whines, hums, squeals), or impulsive components (hammering, shooting, barking dogs) or is continually coming on and off so that it is very difficult to "tune it out". Perhaps it interferes with important activities like sleep, relaxation, conversation or listening to music, TV, radio or natural sounds. The sound may have unpleasant associations for the listener, create fear, convey unwanted information or result from an activity that is considered destructive or pointless but is outside the listener's control. *Therefore, while the tree that falls in a deserted forest clearly creates sound, it does not create noise, since there is no one to hear the crash and judge it to be noisy.*

Noise is widely recognized as a form of environmental pollution. However, there is a significant difference between noise and others familiar forms of pollution such as that of air and water. There may be some disagreement over what levels of air or water pollution are truly harmful but there is general agreement that air and water pollution are not "good things" and that the world would be better off without them. However, in the case of noise, there are often significant groups of people that think the noise they are creating or being exposed to is, in fact, a "good thing" (e.g. motorcycle clubs, boom-car owners or fans at an outdoor rock concert or car race). Such groups often can't understand why others are bothered by their noise and/or don't particularly care if they are. Such differences in perception of what constitutes noise and how the rights of individuals or groups to make noise should be weighed against the rights of others to enjoy peace and quiet often lead to conflicts within multi-family residential buildings, within neighbourhoods, at public and council meetings and in courtrooms. They also complicate the process of establishing community noise guidelines and/or limits that are considered fair and reasonable by all parties.

2.3 What effects can noise have on us?

At the levels and for the durations that most of us are exposed to unwanted sound in our homes or in the community, noise can have the following general types of negative effects: it can interfere with essential/important activities, it can cause annoyance/fear, or it can do both. The thresholds for interference with activities like speech and sleep are fairly well known and have been used to establish guidelines for acceptable levels of noise in residential areas such as the widely referenced 24-hour average noise level of 55 dBA established for road traffic noise by the Canada Mortgage and Housing Corporation, or CMHC (Reference 2). Intrusive noise at 55 to 60 dBA can begin to interfere with normal outdoor speech at a separation of 1 to 2 m. Speech interference can begin to occur at much lower levels (35 to 45 dBA) in classroom and group situations. The level at which noise will begin to disrupt sleep depends on how deeply one is sleeping (sleep stage) but can be as low as 30 to 35 dBA for sustained noise. Quite low levels of intrusive noise can also delay our falling asleep. Much louder noises are required to arouse people from the deepest sleep stages. While many sleepers appear to habituate or "get used to" familiar nighttime noises and are no longer regularly aroused or wakened by them, the body

still reacts to such noises in sub-conscious ways which impair sleep quality and deprive the body of needed rest.

It is more difficult to define a noise level threshold below which people will not be annoyed by noise. Annoyance due to intrusive noise, and the stress and aggravation that often accompanies it, are largely personal, subjective responses. Whether a particular noise is found annoying depends on the listener, their state of mind and health and the activity they are engaged in. Sensitivity to annoyance by noise varies greatly from person to person. Some are driven to distraction by sounds that others can barely hear and pay no notice to. Others live and work in very noisy environments with no apparent concern. Some noises can cause annoyance even at levels not much above the threshold of hearing, particularly if they have undesirable characteristics such as tonality (e.g. hot tub or heat pump hum) or impulses (footsteps, or hammering), carry unwanted information (speech or music) or if past experience has caused the listener to become "sensitized" to the noise.

Because of the many other physical and social factors involved, it has proven difficult for investigators to prove that prolonged exposure to excessive noise in the community or workplace is directly related to negative health effects other than hearing loss. However, the World Health Organization (Reference 3) considers noise to be an "unspecific stressor" which stimulates body systems, and, along with other environmental and lifestyle factors, can have significant temporary and permanent effects on overall human health.

At sustained levels of 80 to 85 dBA or more, daily exposure to noise over many years (as in the workplace – typically for 7 to 8 hours per day), or over much briefer periods at higher levels, can cause significant hearing damage. High frequency sensitivity tends to be lost first and this can lead to difficulty in understanding speech. It is this kind of hearing loss that the exposure limits specified by the Workers' Compensation Board of B.C (Reference 4) are intended to prevent.

After:

What is noise and why does it bother us?

When you interpret a particular sound as “noise,” this is a subjective judgement based on beliefs and attitudes. However, it is typically agreed that noise can be defined as ***unwanted sound.***

Common characteristics of noise

- Contains pure tones.
- Repetitive.
- Difficult to ignore.
- Interferes with important activities.
- Has unpleasant associations.
- Creates fear.
- Conveys unwanted information.
- Results from an activity that is considered destructive or pointless.
- Is outside the listener’s control.

Noise is widely recognized as a form of environmental pollution. Unlike air or water pollution, there are often significant differences in perception when it comes to noise. What is considered noise to one person may be an enjoyable sound to another.

Given these differences in perception, how should the rights of individuals or groups to make noise be weighed against the rights of others to enjoy peace and quiet? Such questions often lead to conflicts within communities and complicate the process of establishing community noise guidelines that are considered fair and reasonable by all parties.

What effects can noise have on us?

Noise can affect us negatively. It can:

- It can interfere with important activities.
- It can cause annoyance.
- It can cause fear.

Noise thresholds

Noise thresholds are used to establish guidelines for acceptable levels of noise. For example, the Canada Mortgage and Housing Corporation (CMHC) established a 24-hour average noise level of 55 dBA for road traffic noise in residential areas (Reference 2).

Noise can interfere with different activities depending on volume:

- 55 – 60 dBA: Can interfere with outdoor speech at a separation of 1 to 2m.
- 35 – 45 dBA: Can interfere with indoor speech in classroom and group settings.
- 30 – 35 dBA: Can interfere with sleep (depending on how deeply you are sleeping.)