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# TITLE 7 NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

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### 1100 Division of Air Quality

#### 1149 Regulations Governing the Control of Noise

Pursuant to Provisions of Part VII, 7 Del. C., Chapter 71, Section 7105 Regulations Governing the Control of Noise Per Order No. 82-A-2 of January 20, 1982 As Amended July 8, 1982

#### 1.0 Short Title

These regulations may be cited as the "Noise Regulations of the State of Delaware".

#### 2.0 Scope

Pursuant to the provisions of Part VII, Title 7, Chapter 71 of the **Delaware Code**, these regulations are to prevent, prohibit and provide for the abatement of excess and unnecessary noise and/or vibration which may endanger the health, safety and welfare, jeopardize the value of property and erode the integrity of the environment of the people of this state.

#### 3.0 Definitions

**"Ambient Noise"** means the all-encompassing background noise associated with a given environment without the sound contribution of the specific source in question.

**"A-Weighted Sound Level"** means the sound pressure level in decibels as measured with a sound level meter using the A-weighting network, which compensates for human hearing characteristics. The level so read is designated dB(A) or dBA.

**"Best Practical Noise Control Measures"** means noise control devices, technology, and procedures determined or approved by the Secretary to be the best practical, taking into consideration the age of the equipment and facilities involved, the process employed, capital expenditures, maintenance cost, technical feasibility and the engineering aspects of the applicable noise control techniques in relation to the control achieved and the non-noise control environmental impact.

**"Commercial Area"** means land used for purposes such as retail sales, personal services, civic centers, hotels, offices and office buildings, wholesale and warehouse storage.

**"Construction"** means any site preparation, assembly, erection, placement, demolition, substantial repair, alteration or similar action for public or private rights-of-way, structures, facilities or similar property.

**"Day"** means the hours between 7:00 a.m. and 10:00 p.m.

**"Day-Night Average Sound Level (Ldn)"** means the 24-hour energy average of the A-weighted sound pressure level, with the levels during the period 10:00 p.m. to 7 a.m. weighted by 10 dBA before averaging.

**"Decibel (dB)"** means a standard unit for measuring the sound pressure level. It is equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to a reference pressure, which is 20 micropascals.

**"Emergency"** means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate actions.

**"Equivalent A-Weighted Sound Level, abbreviated Leq(x)dB(A)"** means the constant sound level that, in a given situation and time period (x), contains the same sound energy as the actual time-varying A-weighted sound.

**"Farm Vehicle"** means a wheeled device used for transportation in farming operations.

**"Hertz (Hz)"** means a unit of measurement of frequency formerly stated as, and numerically equivalent to, cycles per second.

**"Impulse Sound"** means sound of short duration, much less than one second, with an abrupt onset and rapid decay, separated in time by at least one second.

**"Industrial Area"** means land used for purposes such as publishing, research, development, testing, manufacturing, processing, fabricating or repairing, and may include residential land use, for caretaker, watchman or janitor.

**"Infrasonic Sound"** means sound pressure levels having frequencies below 16 Hz.

**"Intrusion Alarm"** means a device with an audible signal which, when activated, indicated intrusion by an unauthorized person.

**"Intrusive Noise"** means unwanted sound which intrudes over and above the existing noise at a given location. The relative intrusiveness of the sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content as well as the prevailing ambient noise level. A sound pressure level of 3 dB(A) above the ambient level is normally just discernable, with levels of 5 dB(A) to 10 dB(A) the lower level region for complaints.

**"Motorboat"** means any vessel which operates on water and is propelled by machinery.

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**"Night"** means the hours between 10:00 p.m. and 7:00 a.m.

**"Noise"** means any sound which annoys or disturbs humans or which causes or tends to cause an adverse psychological or physiological effect on humans, excluding all aspects of noise regulated by the Federal Occupational Safety and Health Act.

**"Noise Disturbance"** means any sound which (a) endangers or injures the safety or health of humans or animals, or (b) annoys or disturbs a reasonable person of normal sensitivities, or (c) jeopardizes the value of property and erodes the integrity of the environment. Compliance with Sec. 71-1-6 herein shall constitute elimination of a noise disturbance.

**"Octave"** means the interval embracing eight diatonic degrees between two sounds having a basic frequency ratio of two. (One unit of the musical scale).

**"Percentile Level"** means the sound levels exceeded for the percentage of time in any measured period. L10, L50 and L90, the levels exceeded for 100, 5096 and 9094 of the time, are frequently used as measures of peak, average and ambient levels respectively.

**"Person"** means any individual (s), corporation, company, association, society, firm, partnership or joint stock company, and includes the State and all of its political subdivisions, agencies and instrumentalities as well as any department, board or agency of the government of the United States.

**"Pure Tone"** means any sound which can be distinctly heard as a single pitch or a set of single pitches. For the purpose of this section, a pure tone shall exist if the one-third octave arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by 15 dB for bands with center frequencies less than 160 Hz, by 8 dB for bands with center frequencies of 160 Hz to 400 Hz, and by 5 dB for bands with center frequencies greater than 400 Hz.

**"Real Property Boundary"** means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but not including intra-building real property divisions.

**"Residential Area"** means land used for the primary purpose of providing human living accommodations.

**"Secretary"** means the Secretary of the Department of Natural Resources and Environmental Control.

**"Sound"** means an oscillation in pressure, particle displacement particle velocity or other physical parameters, in a medium with internal forces that causes compression and rarefaction of that medium. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

**"Sound Amplifying Equipment"** means any device for increasing the magnitude of the human voice, music or other sound.

**"Sound Level"** means the sound pressure level (SPL) obtained by the use of a sound level meter and frequency weighting network, such as A, B or C as specified in American National Standards Institute specifications for sound level meters (ANSI 51.4-1971, or the latest approved revision thereof). The unit of measurement is the decibel. If the frequency weighting employed is not indicated, the A-weighting shall apply.

**"Sound Pressure"** means the instantaneous difference between the actual pressure and the average or barometric pressure at a given point in space, as produced by sound energy.

**"Stationary Noise Source"** means a device which creates sound while fixed in position, including but not limited to residential, commercial or industrial machinery, pumps, fans, compressors, air conditioners and refrigeration equipment.

**"Ultrasonic Sound"** means sound pressure levels having frequencies above 20,000 Hz.

**"Vibration"** means an oscillatory motion of solid bodies of deterministic or random nature described by displacement, velocity, or acceleration with respect to a reference point, such that:

$$v = 2\pi f d \text{ where } v = \text{Velocity, } f = \text{Frequency and } d = \text{Peak Displacement Amplitude}$$

$$a = 2\pi f v \text{ where } a = \text{Acceleration}$$

**"Weekday"** means any day Monday through Friday which is not a legal holiday.

#### 4.0 Prohibited Acts

4.1 Noise Disturbance Prohibited - No person shall make, continue, or cause to be made or continued, any noise disturbance. Noncommercial public speaking and public assembly activities conducted on any public space or public right-of-way shall be exempt from this section, provided they conform to all local ordinances.

4.2 Specific Prohibitions

4.2.1 Radios, Television Sets, Musical Instruments and Similar Devices - Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier, automobile radio, automobile stereo or high fidelity equipment or similar device which produces, reproduces or amplifies sound:

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- 4.2.1.1 In such a manner as to create a noise disturbance within a receiving property.
- 4.2.1.2 In such a manner as to create a noise disturbance within any receiving property when operated in or on a motor vehicle on a public right-of-way or public space, or in a boat on public waters.
- 4.2.1.3 In such a manner as to create a noise disturbance to any person other than the operator of the device, when operated by any passenger on a common carrier.
- 4.2.2 controlling any animal or bird which barks, bays, cries, squawks or makes any other noise continuously or incessantly for a period of ten minutes or makes such noise intermittently for one-half hour or more causing a noise disturbance within a receiving property; provided, however, that at the time the animal or bird is making such noise no person is trespassing or threatening to trespass upon private property in or upon which the animal or bird is situated or for any other legitimate cause which teased or provoked the animal or bird.
- 4.2.3 Loading or Unloading - Loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. the following day in such a manner as to cause a noise disturbance within a Class A receiving property. This section shall not apply during an emergency.
- 4.2.4 Construction - Operating or permitting the operation of any tools or equipment used in construction, drilling or demolition work:
  - 4.2.4.1 Between the hours of 10:00 p.m. and 7:00 a.m. the following day, on weekdays and Saturdays, or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance within a Class A receiving property, except during an emergency.
  - 4.2.4.2 At any other time such that the sound level within any receiving property exceeds an L<sub>eq</sub> of 85 dBA for a period of one hour.
  - 4.2.4.3 This section shall not apply to the use of domestic power tools subject to Section 4.0.2(8).
- 4.2.5 Vehicle, Motorboat, or Aircraft Repairs and Testing -Repairing, rebuilding, or testing any motor vehicle, motorcycle, motorboat, or aircraft in such a manner as to cause a noise disturbance within a Class A receiving property between the hours of 10 p.m. and 7 a.m.
- 4.2.6 Places of Public Entertainment -Operating, playing, or permitting the operation or playing of any radio, television phonograph, drum, musical instrument, sound amplifier or any other device which produces, reproduces, or amplifies sound within any place of public entertainment at a sound level greater than 85 dB(A) as read by the slow response on a sound level meter at any point that is normally occupied by a customer unless a conspicuous and legible sign is located outside such place, near each public entrance stating "WARNING: SOUND LEVELS WITHIN MAY CAUSE PERMANENT HEARING IMPAIRMENT". All places of public entertainment shall also be required to comply with all of the provisions of this Regulation, specifically Section 6.0.
- 4.2.7 Explosives, Firearms, and Similar Devices - The use or firing of explosives, firearms, or similar devices which create impulsive sound so as to cause a noise disturbance within a Class A receiving property or on a public right-of-way, except for licensed game-hunting activities on property where such activities are authorized.
- 4.2.8 Domestic Power Tools - Operating or permitting the operation of any mechanically powered saw, drill, sander, grinder, lawn or garden tool, snowblower, or similar device in residential areas between the hours of 10:00 p.m. and 7:00 a.m. so as to cause a noise disturbance within a Class A receiving property.
- 4.2.9 Tampering
  - 4.2.9.1 No person shall operate any equipment unless all noise and/or vibration control devices installed thereon are in full operation.
  - 4.2.9.2 No person shall tamper with, circumvent or remove any sound level monitoring instrument, meter or device positioned by or for the Department.
  - 4.2.9.3 No person shall remove or deface a noise label on any product.
- 4.3 Motor Vehicle Prohibitions.
  - 4.3.1 Motor Vehicle and Motorcycles on Public Rights-of-Way - No person shall operate or cause to be operated a public or private motor vehicle or motorcycle, or any equipment attached to such a vehicle, on a public right-of-way at any time in such a manner that the sound level emitted by the motor vehicle or motorcycle, or any equipment attached to such a vehicle, exceeds the level set forth in Title 7, Chapter 71, Subchapter II, Delaware Motor Vehicle Noise Regulations.
  - 4.3.2 Standing Motor Vehicles and Motorcycles - No person shall operate or permit the operation of any motor vehicle, motorcycle, or any auxiliary equipment attached to such a vehicle in such a way as to cause a noise disturbance within a Class A receiving property, for a period longer than twenty minutes in any hour while the vehicle is stationary, for reasons other than traffic congestion. (Also see Sec. 4.2.3 Loading or Unloading).

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4.3.3 Unnecessary Horn Blowing - No person shall at any time sound the horn or other warning device of a vehicle in such a way as to cause a noise disturbance within a Class A receiving property except when absolutely necessary as a warning while actually driving such vehicle.

### 5.0 Classification of Land According to Use

5.1 Lands designated Class A shall generally be residential areas where human beings sleep or areas where serenity and tranquility are essential to the intended use of the land.

5.1.1 The land uses in this category shall include, but not be limited to, single and multiple family homes, hotels, prisons, hospitals, religious facilities, cultural activities, forest preserves, and land intended for residential or special uses requiring such protection.

5.2 Class B noise zone

5.2.1 Lands designated Class B shall generally be commercial in nature, areas where human beings converse and such conversation is essential to the intended use of the land.

5.2.2 The land uses in this category shall include, but not be limited to, retail trade, personal, business and legal services, educational institutions, government services, amusements, agricultural activities, and lands intended for such commercial or institutional uses.

5.3 Class C noise zone

5.3.1 Lands designated Class C shall generally be industrial where protection against damage to hearing is essential, and the necessity for conversation is limited.

5.3.2 The land uses in this category shall include, but not be limited to, manufacturing activities, transportation facilities, warehousing, military bases, mining, and other lands intended for such uses.

5.4 Mixed Class Noise Zone

5.4.1 Good land planning arranges for Class A zones to be buffered from Class C zones by a Class B zone. Some areas are mixed zones in practice, wherein Class C land uses abut, adjoin or include Class A use. Whenever this situation comes to the attention of the Department, the person responsible for the objectionable noise source shall make every effort to conform with Section 6.0. A final acceptable noise limit shall be determined by the Secretary based on Best Practical Noise Control Measures.

### 6.0 Maximum Noise and Vibration Limits

6.1 No person(s) shall operate or cause to be operated any stationary source of sound in such a manner as to create a 24-hour equivalent A-weighted sound level which exceeds the Leg limits set forth for the receiving land use category in Table 1 when measured at the point of complaint origination within the property boundary of the receiving land use. Any exceedence of these values shall constitute a noise disturbance.

Table 1 Sound Levels by Receiving Land Use Zones, L,a (24) dBA

Emitter(s)	Receptor C	Receptor B	Receptor A 7 a.m. - 10 p.m.	Receptor A 10 p.m. - 7 a.m.
A	65	65	65	55
B	75	75	65	55
C	85	75	65	55

6.2 INTRUSIVE NOISE LEVEL

6.2.1 NOT WITHSTANDING THE PROVISIONS OF SECTION 6.1, A SOURCE SHALL BE CONSIDERED TO CAUSE A NOISE DISTURBANCE IF THE SOUND LEVEL, OTHER THAN AN IMPULSE, INFRASONIC OR ULTRASONIC SOUND, EMITTED BY SUCH SOURCE EXCEEDS THE AMBIENT NOISE LEVEL BY 10 dBA WHEN MEASURED AT THE POINT OF COMPLAINT ORIGINATION WITHIN THE RECEIVING PROPERTY.

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Note: The relative intrusiveness of sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content as well as the prevailing ambient noise level. A sound pressure level of 3 dB(A) above the ambient level is normally just discernable, with levels of 5 dB(A) to 10 dB(A) the lower level region for complaints.

### 6.3 Correction for Character of Sound

6.3.1 For any stationary source of sound which emits a pure tone, cyclically varying sound or repetitive impulse sound, the limits set forth in Section 6.0 herein shall be reduced by 5 dBA.

### 6.4 Impulse Peak Limit

6.4.1 For any source of sound which emits an impulse (duration less than one second with an abrupt onset and rapid decay) including metal to metal impacts or exploding impacts, shall not exceed the peak levels set forth below when measured at the point of complaint origination within the receiving property.

Class A Zone Nighttime

80 dB

100 dB

Anytime Any Zone except the above

### 6.5 Infrasonic and Ultrasonic Peak Limit

6.5.1 For any source of sound which emits infrasound (below 16 Hertz) or ultrasound (above 20 kHz) frequencies, the sound pressure level shall not exceed 100 dB when measured at the point of complaint origination within the receiving property.

### 6.6 Maximum Permissible Vibration Levels

6.6.1 No person shall operate or cause to be operated any single vibration source or combination of sources in such a manner as to cause vibration levels in excess of those set forth below as measured at the point of complaint origination within the boundary of the receiving property.

6.6.1.1 Class A Zone Stationary Source ---Velocity of 0.15 inch per second

6.6.1.2 Class A Zone Temporary or Mobile Source ---Velocity of 0.7 inch per second

6.6.1.3 Class B Zone ---Velocity of 0.7 inch per second

6.6.1.4 Any Zone under any condition ---Velocity of 3 inches per second (Caution level for structure damage)

## 7.0 Exceptions

7.1 Exempted from these regulations are:

7.1.1 FAA Controlled Operations - Noise directly caused by aircraft flight operations specifically preempted by the Federal Aviation Administration.

7.1.2 Recreational, Sports and Musical Activities - Noise created by the use of property for the purposes of recreational, sports or musical activities, provided such exemption is effective only during the specific period of time authorized by the political subdivision or government entity having lawful jurisdiction to sanction such use.

7.1.3 Emergencies - Noise created as a result of, or related to, an emergency, including (a) the emission of sound for the purpose of alerting persons to the existence of an emergency, or (b) the emission of sound in the performance of emergency work.

7.1.4 Emergency Signaling Device Tests -

7.1.4.1 Testing of emergency signaling devices the same time of day each time such tests are performed, using a minimum cycle test time.

7.1.4.2 Testing of the complete emergency signaling system, including the function of signaling devices and the personnel response to the signal, shall not occur more than once in each calendar month.

7.1.5 Religious Activities - Sounds created by bells, carillons or chimes associated with religious observances.

7.1.6 Public Celebrations - Patriotic or public celebrations not extending more than one day or as authorized by the public subdivision or government entity empowered to sanction such activity.

7.1.7 Farm - All farm vehicles are exempt while engaged in farming operations.

7.1.8 The Unamplified Human Voice - including children at schools, playgrounds, etc.

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7.1.9 Interstate Railway Locomotives and Rail Cars - Noise directly caused by railway operations specifically preempted by the Federal Government.

**8.0 Validity of Regulations**

If any section or subsection of these regulations is found invalid, the remainder shall continue to be valid and enforceable.