DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DIVISION OF AIR AND WASTE MANAGEMENT

Statutory Authority: 7 Delaware Code, Chapter 60, (7 **Del.C.** Ch. 60)

PROPOSED

1103 Ambient Air Quality Standards

~~Regulation No. 3~~ 1103 Ambient Air Quality Standards

09/11/1999

~~Section 1~~

1.0 General Provisions

1.1 Air ~~Q~~quality ~~S~~standards are required to assure that ambient air quality shall be consistent with established criteria and shall serve to effectively and reasonably manage the air resources of the State of Delaware.

1.2 At such time as additional pertinent information becomes available with respect to applicable air quality criteria, recommendations shall be incorporated and the air quality standards shall be subject to revisions.

1.3 The absence of a specific ambient air quality standard shall not preclude actions by the Department to control contaminants to assure protection, safety, welfare, and comfort of the people of the State of Delaware.

1.4 Air ~~Q~~quality ~~S~~standards are defined by frequency distribution presentations and arithmetic averages. The characteristic parameters describing the frequency distribution are the geometric mean and 99th percentile.

1.4.1 ~~a.~~ The geometric mean is defined as the Nth root of the product of N numbers. Assuming a log-normal cumulative frequency distribution, the 50th percentile value will be equal to the geometric mean.

1.4.2 ~~b.~~ The arithmetic average (mean) is defined as the sum of a set of values divided by the number of values.

1.4.3 ~~c.~~ The 99th percentile for a group of numbers is defined as that value which is exceeded by one percent of the numbers.

1.5 The ambient air quality values stated herein shall apply to all areas outside a source property line.

1.6 The sampling and analytical procedures and techniques employed to determine ambient air concentrations of contaminants shall be consistent with methods which result in a representative evaluation of the prevailing conditions. The following methods shall be used directly or employed as reference standards against which other methods may be calibrated;

1.6.1 ~~a.~~ Ambient concentrations of total suspended particulates shall be determined by the reference high volume method in accordance with 40 CFR, Part 50, Appendix B, June 29, 1979.

1.6.2 ~~b.~~ Ambient concentrations of sulfur dioxide shall be determined by the reference or equivalent method in accordance with 40 CFR, Part 50, Appendix A, June 29, 1979.

1.6.3 ~~c.~~ Ambient concentrations of carbon monoxide shall be determined by the reference method in accordance with 40 CFR, Part 50, Appendix C, June 29, 1979.

1.6.4 ~~d.~~ Ambient concentrations of ozone corrected for interferences due to nitrogen oxides and sulfur dioxide shall be determined by the reference method in accordance with 40 CFR, Part 50, Appendix D, June 29, 1979.

1.6.5 ~~e.~~ Ambient concentrations of methane and non-methane hydrocarbons shall be determined by the reference method in accordance with 40 CFR, Part 50, Appendix E, June 29, 1979.

1.6.6 ~~f.~~ Ambient concentrations of nitrogen dioxide shall be determined by the reference method in accordance with 40 CFR, Part 50, Appendix F, June 29, 1979.

1.6.7 ~~g.~~ Ambient concentrations of hydrogen sulfide shall be determined by gas chromatographic separation - flame photometric detection.

1.6.8 ~~h.~~ Ambient concentrations of lead shall be determined by the reference method in accordance with 40 CFR, Part 50, Appendix G, June 29, 1979.

1.6.9 ~~i.~~ Ambient concentrations of PM_{10} particulate shall be determined by a reference method in accordance with 40 CFR, Part 50, Appendix J, or an equivalent method.

1.6.10 ~~j.~~ Ambient concentrations of $PM_{2.5}$ particulate shall be determined by the reference method based on 40 CFR, Part 50, Appendix L, as found in the Federal Register dated July 18, 1997, on page 38714–38752.

1.7 Air quality standards are expressed in metric units with the approximate equivalent volumetric units in parentheses. The standard conditions for air ambient monitoring is 760 mm. Hg and 25°C. The formula to convert metric units to parts per million (ppm) is:

$$\text{ppm(vol)} = \frac{\mu\text{g/m}^3 \times 0.024465}{\text{MW}} \quad \text{or} \quad \frac{\text{mg/m}^3 \times 24.465 \times 10^{-6}}{\text{MW}}$$

where MW is molecular weight of the contaminant being measured.

02/01/1981

~~Section 2~~

2.0 General Restrictions

~~2.1~~ No person shall cause the ~~A~~air ~~Q~~quality ~~S~~standards specified in this regulation to be exceeded.

02/01/1981

~~Section 3~~

3.0 Suspended Particulates

3.1 The Primary Ambient Air Quality Standards for Particulate Matter are:

3.1.1 ~~a.~~ An annual geometric mean of 75 micrograms per cubic meter not to be exceeded, based upon ~~twenty-four~~ 24 hour average concentrations.

3.1.2 ~~b.~~ A value of 260 micrograms per cubic meter not to be exceeded more than once per year, based upon ~~twenty-four~~ 24 hour average concentrations.

3.2 The Secondary Ambient Air Quality Standards for Particulate Matter are:

3.2.1 ~~a.~~ An annual geometric mean of 60 micrograms per cubic meter as a guideline for achieving the secondary standard based upon twenty-four 24 hour average concentrations.

3.2.2 ~~b.~~ A value of 150 micrograms per cubic meter not to be exceeded more than once per year, based upon ~~twenty-four~~ 24 hour average concentrations.

02/01/1981

~~Section 4~~

4.0 Sulfur Dioxide

4.1 The Primary Ambient Air Quality Standards for Sulfur Oxides measured as Sulfur Dioxide are as follows:

4.1.1 ~~a.~~ An annual arithmetic average value of 80 $\mu g/m^3$, (0.03 ppm) not to be exceeded, based upon ~~twenty-four~~ 24 hour average concentrations.

4.1.2 ~~b.~~ A twenty-four average value of 365 $\mu g/m^3$ (0.14 ppm) not to be exceeded more than once per year based upon ~~twenty four~~ 24 hour average concentrations.

4.2 The Secondary Ambient Air Quality Standards for Sulfur Oxides measured as Sulfur Dioxide are as follows:

4.2.1 ~~a.~~ A three-hour average value of 1300 micrograms per cubic meter (0.5 ppm), not to be exceeded more than once per year.

02/01/1981

~~Section 5~~

5.0 Carbon Monoxide

5.1 The average concentration of carbon monoxide taken over any consecutive eight ~~(8)~~ hours shall not exceed a value of 10 milligrams per cubic meter (9 ppm) more than once per year.

5.2 The average concentration of carbon monoxide taken over any one ~~(1)~~ hour period shall not exceed 40 milligrams per cubic meter (35 ppm) more than once per year.

09/11/1999

~~Section 6~~

6.0 Ozone

6.1 ~~1~~One-hour primary and secondary ambient air quality standards for ozone

The average number of days per calendar year with a maximum one hour average value exceeding 235 $\mu g/m^3$ (0.12 ppm) shall be equal to or less than one, averaged over three consecutive years. This standard shall be applicable to New Castle County and Kent County. ~~Counties.~~

6.2 ~~8~~Eight-hour primary and secondary ambient air quality standards for ozone

The average of the fourth highest daily maximum ~~8~~ eight-hour average ozone concentration is less than or equal to 0.08 ppm, averaged over three consecutive years. This standard applies to all counties in Delaware.

02/01/1981

~~Section 7~~

7.0 Hydrocarbons

7.1 The hydrocarbons standard in ~~subsection~~ 7.2 of this regulation is for use as a guide in devising implementation plans to achieve the ozone standard.

7.2 The average concentration of hydrocarbons, exclusive of methane, taken over a three ~~(3)~~ hour period from 6~~:00~~ a.m. to 9~~:00~~ a.m., local time, shall not exceed 160 micrograms per cubic meter (0.24 ppm) more than once per year.

02/01/1981

~~Section 8~~

8.0 Nitrogen Dioxide

~~8.1~~ The annual arithmetic mean concentration of nitrogen dioxide shall not exceed 100 micrograms per cubic meter (0.05 ppm).

02/01/1981

~~Section 9~~

9.0 Hydrogen Sulfide

9.1 The average concentration of hydrogen sulfide taken over any consecutive three ~~(3)~~ minutes shall not exceed 0.06 ppm.

9.2 The average concentration of hydrogen sulfide taken over any consecutive 60 minutes shall not exceed 0.03 ppm.

02/01/1981

~~Section 10~~

10.0 Lead

~~10.1~~ The 24 hour concentration of lead averaged over a calendar quarter shall not exceed 1.5 micrograms per cubic meter.

02/11/2003

~~Section 11 –~~

11.0 PM_{10} and $PM_{2.5}$ Particulates

11.1 The Primary and Secondary Ambient Air Quality Standards for Particulate Matter, measured as PM_{10} are:

11.1.1 ~~a.~~ 150 micrograms per cubic meter ($\mu g/m^3$), 24-hour average concentration. The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$, as determined in accordance with 40 CFR, Part 50, Appendix K, is equal to or less than one.

11.1.2 ~~b.~~ 50 micrograms per cubic meter ($\mu g/m^3$), annual arithmetic mean. The standards are attained when the expected annual arithmetic mean concentration, as determined in accordance with 40 CFR, Part 50, Appendix K, is less than or equal to 50 $\mu g/m^3$.

11.2 The Primary and Secondary Ambient Air Quality Standards for Particulate Matter, measured as $PM_{2.5}$ are:

11.2.1 ~~a.~~ 65 micrograms per cubic meter ($\mu g/m^3$) 24-hour average concentration. The 24-hour primary and secondary $PM_{2.5}$ standards are met when the 98th percentile 24-hour concentration, as determined in accordance with 40 CFR, Part 50, Appendix N, as found in the Federal Register dated July 18, 1997, on page 38757-38758, is less than or equal to 65 $\mu g/m^3$

11.2.2 ~~b.~~ 15.0 micrograms per cubic meter ($\mu g/m^3$) annual arithmetic mean concentration. The annual primary and secondary $PM_{2.5}$ standards are met when the annual arithmetic mean concentration, as determined in accordance with 40 CFR, Part 50, Appendix N, as found in the Federal Register dated July 18, 1997, on page 38756-38757, is less than or equal to 15.0 $\mu g/m^3$.

12 DE Reg. 29 (07/01/08) (Prop.)