DENR ADMINISTRATIVE NO. \_\_\_\_

Series of 2024

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| SUBJECT | : | UPDATING OF SECTION 19 OF RA 8749 ON THE NATIONAL EMISSION STANDARDS FOR SOURCE SPECIFIC AIR POLLUTANTS (NESSSAP), ESTABLISHMENT OF MASS EMISSION RATE STANDARDS (MERS) FOR PARTICULATE MATTER (PM), SULFUR OXIDES AS SULFUR DIOXIDE (SOX AS SO2), NITROGEN OXIDES AS NITROGEN DIOXIDE (NOX AS NO2), AND CARBON MONOXIDE (CO) AND ESTABLISHMENT OF EMISSION CHARGE SYSTEM PURSUANT TO SECTION 13 OF RA 8749 |

**Section 1. Legal Basis**

Pursuant to Article 3, Section 19 of Republic Act No. 8749 otherwise known as the “Philippine Clean Air Act (PCAA) of 1999”, and Section 6, Rule XXV, Part VII of the Department Administrative Order No. 81, Series of 2000 (DAO 2000-81) also known as the Implementing Rules and Regulations (IRR) of the PCAA, states that the Department shall, within two (2) years from the effectivity of this Act, and every two (2) years thereafter, review, or as the need therefore arises, revise and publish emission standards, *to further improve the emission standards for stationary sources of air pollution*. Such emission standards shall be based on mass rate of emission for all stationary sources of air pollution based on internationally-accepted standards, but not be limited to, nor be less stringent than such standards and with the standards set forth in the Act. The standards, whichever is applicable, shall be the limit on the acceptable level of pollutants emitted from a stationary source for the protection of the public's health and welfare. It is further stated in Section 4, Rule XXV, Part VII of the DAO 2000-81 that sampling for compliance purposes shall be conducted using the prescribed method in the Act and its IRR or other equivalent method approved by EMB.

Furthermore, the revision and establishment of said standards shall be applied to the quarterly submission of the Self-Monitoring Report (SMR) pursuant to Section 5, DAO 2003-27 *“Amending DAO 26, DAO 29, and DAO 2000-81, Among Others on the Preparation and Submission of Self-Monitoring Report (SMR)”*.

Pursuant to Article 1, Section 13 of Republic Act No. 8749, *“The Department, in case of industrial dischargers, and the Department of Transportation and Communications (DOTC), in case of motor vehicle dischargers, shall, based on environmental techniques, design, impose on and collect regular emission fees from said dischargers as part of the emission permitting system or vehicle registration renewal system, as the case may be. The system shall encourage the industries, and motor vehicles to abate, reduce, or prevent pollution. The basis of the fees include, but is not limited to, the volume and toxicity of any emitted pollutant. Industries, which shall install pollution control devices or retrofit their existing facilities with mechanisms that reduce pollution shall be entitled to tax incentives such as but not limited to tax credits and/or accelerated depreciation deductions.”*

**Section 2. Objective**

The objective to tighten emission standards from industries is driven by the need to address environmental concerns, improve air quality, mitigate climate change, and safeguard public health. Below are specific objectives associated with tightening emission standards from industries:

1. Reducing Air Pollution: Stricter emission standards aim to significantly reduce the release of harmful pollutants such as sulfur dioxide (SO2), nitrogen oxides (NOX), particulate matter (PM), volatile organic compounds (VOCs), and other hazardous substances emitted by industrial processes. This reduction directly contributes to improving overall air quality.
2. Protecting Public Health: Tightening emission standards helps minimize exposure to pollutants known to cause respiratory diseases, cardiovascular issues, and other health problems. Lowering emissions from industries can lead to a healthier population and a decrease in related health-care costs.
3. Addressing Climate Change: Greenhouse gas emissions, including Carbon Dioxide (CO2) and methane (CH4), contribute to climate change. By imposing stricter standards on industries, there's a concerted effort to reduce greenhouse gas emissions, supporting global climate change mitigation efforts.
4. Environmental Conservation: Industrial emissions, when released into the environment, can harm ecosystems, water bodies, and biodiversity. Implementing stricter emission standards helps protect natural habitats and wildlife by reducing the impact of pollutants.
5. Encouraging Technological Innovation through Incentives: Tightening emission standards prompts industries to invest in cleaner technologies, cleaner fuels, develop more efficient processes, and adopt renewable energy sources. This drives innovation and fosters the growth of a cleaner and more sustainable industrial sector.
6. International Commitments: Many nations commit to international agreements and protocols aimed at reducing emissions. Stricter standards align with these agreements, demonstrating a country's commitment to global environmental protection efforts.
7. Promoting Corporate Responsibility: By imposing stringent emission regulations, governments encourage industries to adopt responsible environmental practices. Companies are urged to take responsibility for their environmental impact and adopt measures to reduce it.
8. Creating a Sustainable Future: The ultimate goal is to create a sustainable future where industries operate in harmony with the environment. Tightening emission standards is a step toward achieving this by ensuring a balance between industrial growth and environmental protection.
9. Improving Quality of Life: Cleaner air and a healthier environment lead to an improved quality of life for citizens, fostering a more desirable living environment and promoting overall well-being.

Long-term Economic Benefits: While initial costs might be incurred in complying with stricter standards, the long-term benefits include reduced healthcare costs,

1. improved productivity due to better health, and the growth of cleaner and more sustainable industries.

**Section 4. Scope and Coverage**

This Order shall apply to new / modified stationary sources defined under Section 5 of RA 8749 or any building or immobile structure, facility or installation which emits or may emit any air pollutant. The Maximum Permissible Limit and Annual MERS shall both be applicable to determine the compliance of the abovementioned stationary sources.

**Section 5. Updated NESSSAP and Establishment of Annual MERS for New and Modified Sources**

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| --- | --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Type of APSI** | **Classification** | **Maximum Permissible Limit (mg/NCM)** | **Method of Samplingc** | **Method of Analysisc** | **Annual MERS (tons/yr)** |
| **Particulate Matter (PM)** | Coal-Fired Boilers | Urban and Industrial Area | 75 | United States Environmental Protection Agency (USEPA) Methods 1 - 5 / Continuous Emissions Monitoring System (CEMS) for PM Compliant with USEPA Performance Specification (PS) 11 | Gravimetric per Sampling Method for Methods 1 – 5 / CEMS for PM Compliant with USEPA PS11 | Please refer to Section 6 MERS Calculation  |
| Rural and Other Area | 100 |
| Liquid-Fired Boilers | Urban and Industrial Area | 75 |
| Rural and Other Area | 100 |
| Biomass-Fired Boilers | Urban and Industrial Area | 105 |
| Rural and Other Area | 140 |
| Reciprocating Internal Combustion Engine (ICE) | Urban and Industrial Area | 75 |
| Rural and Other Area | 100 |
| Cement Plants (kilns, etc.) | N/A | 50 |
| Smelting Furnaces (e.g. Electric Arc Furnace, Induction Furnace, Reheating Furnace) | N/A | 50 |
| Other Stationary Sources (e.g. Sintering Furnace)a | N/A | 100 |
| **Carbon Monoxide (CO)** | Biomass-Fired Boilers | N/A | 350 | USEPA Method 3 or 10 / CEMS for CO Compliant with USEPA PS4 | Orsat Analysis or Non-Dispersive Infrared (NDIR) | Please refer to Section 6 MERS Calculation |
| Cement Plants (kilns, etc.) | N/A | 300 |
| All Other Sources (e.g. Sintering Furnace) | N/A | 250 |
| **Nitrogen Oxides as Nitrogen Dioxide (NOX as NO2)** | Coal-Fired Boilers | N/A | 500 | USEPA Methods 1 - 4 and Method 7 / CEMS for NOX Compliant with USEPA PS2 | Phenol-disulfonicacid Method orper samplingmethod | Please refer to Section 6 MERS Calculation |
| Liquid-Fired Boilers | N/A | 250 |
| Biomass-Fired Boilers | N/A | 250 |
| Reciprocating ICE | N/A | 1000 |
| All Other Sources (e.g. cement kilns) | N/A | 400 |
| Manufacture of Nitric Acid | N/A | 1000 as acid & NO2 calculated as NO2 |
| **Sulfur Oxides as Sulfur Dioxide (SOX as SO2)** | Coal-Fired Boilers | N/A | 350 as SO2 | USEPA Methods 1 through 4 and 6 or 8 as appropriate / CEMS for SOX Compliant with USEPA PS2 | As per samplingmethod | Please refer to Section 6 MERS Calculation |
| Liquid-Fired Boilers | N/A | 350 as SO2 |
| Biomass-Fired Boilers | N/A | 350 as SO2 |
| Reciprocating ICE | N/A | 350 as SO2 |
| Cement Plants (kilns, etc.) | N/A | 400 as SO2 |
| Smelting Furnaces (e.g. Electric Arc Furnace, Induction Furnace, Reheating Furnace) | N/A | 350 as SO2 |
| Other Fuel Burning Equipment | N/A | 350 as SO2 |
| Other Stationary Sourcesb | N/A | 100 as SO3 |
| Manufacture of Sulfuric Acid and Sulfonation Process | N/A | 750 as SO3 |

a - Other Stationary Sources (particulates) means a trade, process, industrial plant, or fuel burning equipment other than thermal power plant, industrial boilers, cement plants, incinerators, smelting furnaces

b - Other Stationary Sources (sulfur oxides) refers to existing and new stationary sources other than those caused by the manufacture of sulfuric acid and sulfonation process, fuel burning equipment and incineration

c – Other methods as approved by the Bureau

**Section 6. Mass Emission Rate Standards Calculation**

1. **Source required to conduct Stack Testing:** Consistent with EMB Memorandum Circular (MC) 2007-003, the calculation of the MERS shall apply to **Small, Medium, Large, Environmentally Critical Sources, and Other Sources Operating Continuously.** The calculation shall be based on the preceding year actual measurements from stack sampling using reference method performed by DENR-EMB Accredited Stack Testers and/or CEMS with recent compliant Relative Accuracy Test Audit (RATA).

Equation No. 1

$$MERS=\left(Updated NESSSAP in Section 5\right)x\left(\frac{20.9\%-Std O\_{2}\%}{20.9\%-Measured O\_{2}\%}\right)x\left(Dry VFR\right)x\left(AOH\right)$$

 Where: MERS = Mass Emission Rate Standard (tons/year)

 Std O2% = based on latest policy MC 2021 – 15 (%)

 Measured O2% = based on USEPA Method 4 (%)

 Dry VFR = Dry Volumetric Flow Rate of the APSI (dry standard cubic meter / min)

 AOH = Annual Operating Hours of the APSI (hours / year)

Sample Calculation:

 Given: Updated PM Standard for CFPP in Urban Area = 75 mg/NCM

 Std O2 Correction Factor = 9%

 O2 Measured = 9%

 Dry VFR = 27,806.51 dscmm

 AOH = 7,852 hrs/yr

Example No. 1

$MERS=\left(75\frac{mg}{NCM}\right)x\left(\frac{20.9\%-9\%}{20.9\%-9\%}\right)x\left(27,806.51\frac{m^{3}}{min} \right)x\left(7,852\frac{hrs}{yr}\right)x\frac{60 mins}{1 hr} x\frac{1 g}{1000 mg} x\frac{1 kg}{1000 g} x\frac{1 ton}{1000 kg}$

 $MERS=982.52\frac{tons}{yr}$

1. **For Sources Exempted from Source Emission Testing:** the EMB may accept Bureau approved methodologies such as calculation using internationally acceptable emission factors and/or material balance.

Equation No. 2

$$MERS=\left(AR\right)x\left(EF\right)x\left(1-\frac{ER}{100}\right)$$

Where: MERS = Mass Emission Rate Standard (tons/year)

AR = Activity Rate (no. of activity/year) is an activity associated with the emission of a source expressed unit weight, volume, distance, or duration of the activity emitting the pollutant (e. g., kilograms of particulate emitted per megagram of coal burned).

EF = Emission Factor (g/activity) is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant

ER = Emission Reduction Efficiency (%) is the product of the control device destruction or removal efficiency and the capture efficiency of the control system

**Section 7. Mass Emission Rate Calculation**

Calculation of the MER shall be based on the following:

1. **Sources required to conduct Stack Testing: For Small, Medium, Large, Environmentally Critical Sources, and Other Sources Operating Continuously:** the calculation shall be based on the preceding year actual measurements from stack sampling using reference method and CEMS with recent compliant Relative Accuracy Test Audit (RATA)

Equation No. 3

$$MER=\left(Actual Concentration\right)x\left(\frac{20.9\%-Std O\_{2}\%}{20.9\%-Measured O\_{2}\%}\right)x\left(Dry VFR\right)x\left(AOH\right)$$

 Where: MER = Mass Emission Rate (tons/year)

 Actual Concentration = based on actual source emission testing (mg/NCM)

Std O2% = based on latest policy MC 2021 – 15 (%)

 Measured O2% = based on USEPA Method 4 (%)

 Dry VFR = Dry Volumetric Flow Rate (dry standard cubic meter / min)

 AOH = Annual Operating Hours (hours / year)

Sample Calculation:

Given: Measured Concentration for PM = 21.86 mg/NCM

 Std O2 Correction Factor = 9%

 O2 Measured = 9%

 Dry VFR = 27,806.51 dscmm

AOH = 7,852 hrs/yr

Example No. 2:

$$MERS=\left(21.86\frac{mg}{NCM}\right)x\left(\frac{20.9\%-9\%}{20.9\%-9\%}\right)x\left(27,806.51\frac{m^{3}}{min} \right)x\left(7,852\frac{hrs}{yr}\right)x\frac{60 mins}{1 hr} x\frac{1 g}{1000 mg} x\frac{1 kg}{1000 g} x\frac{1 ton}{1000 kg}$$

$$MERS=286.37\frac{tons}{yr}$$

**For Sources Exempted from Source Emission Testing:** the EMB may accept Bureau approved methodologies such as calculation using internationally acceptable emission factors and/or material balance

Equation No. 2

$$MER=\left(AR\right)x\left(EF\right)x\left(1-\frac{ER}{100}\right)$$

Where: MER = Mass Emission Rate Standard (tons/year)

AR = Activity Rate (no. of activity/year) is an activity associated with the emission of a source expressed unit weight, volume, distance, or duration of the activity emitting the pollutant (e. g., kilograms of particulate emitted per megagram of coal burned).

EF = Emission Factor (g/activity) is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant

ER = Emission Reduction Efficiency (%) is the product of the control device destruction or removal efficiency and the capture efficiency of the control system

**Section 8. Calculation of Emission Charge Fee (ECF)**

Pursuant to Section 13 of RA 8749, the emission charge fee shall be computed based on the Mass Emission Rate (MER) following the formula:

Equation No. 4

$$Emission Charge Fee \left(PhP\right)=f\_{1} x f\_{2} x f\_{3} x Emission Charge\left(\frac{PhP}{kg}\right) x MER\left(\frac{tons}{yr}\right)$$

Where: MER = Mass Emission Rate (tons/year)

Emission Charge (PhP/kg) = 110 PhP/kg per pollutant (e.g. PM, CO, NOx as NO2, SOx as SO2)

 f1 = Apportionment of Source of Air Pollution per Regional EI (%)

 f2 = Apportionment of Pollutant Contribution per Source (%)

f3 = Apportionment with Respect to the Permitted Sources in the Region (e.g. 1 out of 888 sources)

Sample Calculation:

 Given: EMB Regional Office Emission Inventory CY 2021:

(f1) Stationary Sources = 21.81%

(f2) PM Contribution from Stationary Sources = 8.36%

(f3) 1,536 permitted sources

 MER = 286.37 tons/year

 No NOV was issued to the plant

Example No. 3:

$$Emission Charge Fee \left(PhP\right)=f\_{1} x f\_{2} x f\_{3} x Emission Charge\left(\frac{PhP}{kg}\right) x MER\left(\frac{tons}{yr}\right)$$

$$Emission Charge Fee \left(PhP\right)=\left(\frac{21.81\%}{100}\right)x\left(\frac{8.36\%}{100}\right)x \left(\frac{1}{1,536}\right)x 110\left(\frac{PhP}{kg}\right)x 286.37\left(\frac{tons}{yr}\right)x \left(1000\frac{kg}{ton} \right)=PhP 373.93$$

$$Incentive:$$

$$\frac{\left(75\frac{mg}{NCM}- 21.86 \frac{mg}{NCM}\right)}{75 \frac{mg}{NCM}}\% below the standard =70.93\% below the standard$$

$$Therefore they are qualified for the 25\% discount in the emission charg fee $$

$$Php 373.93 x \left(1- \frac{25}{100}\right)=280.45 Php $$

$$They are only required to pay 280.45 Php for 1 year$$

**Section 9. Collection Scheme of the Emission Charge System**

The ECF shall apply to firms with valid Permit to Operate (PTO) and shall be collected in the fees to be borne by the permittee on the Renewal of its Permit to Operate (PTO).

**Section 10. Recipient of Emission Charge Fee**

The Emission Charge Fee may be paid by the industry in the form of the following:

1. Special fund for Community services (e.g. medical missions, scholarship)
2. Special fund for Environmental services (e.g. coastal clean-up, tree planting)
3. Otherwise, the ECF shall directly be deposited under the Air Quality Management Fund

Section 11. Incentive Scheme

An incentive scheme is based on the environmental performance in terms of compliance with the National Emission Standards for Source Specific Air Pollutants (NESSSSAP) under RA8749 will be implemented to encourage the compliance of firms. Below are schedule of incentive for performing industries:

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| --- | --- |
| Criteria | Incentive |
| 1. Emissions must be 75% below the NESSSAP for pollutants monitored (Stack Sampling / CEMS) and no issuance of the following for the recent 5-years: PAB Case, Notice of Adverse Findings (NAF), Notice of Violation (NOV), Show Cause Order (SCO)
 | 50% less emission charge or Php 55/kg of PM, CO, NOX as NO2, SOX as SO2 |
| 1. Emissions must be 50% below the NESSSAP for pollutants monitored (Stack Sampling / CEMS) and one (1) issuance of the following within 5-years: PAB Case, Notice of Adverse Findings (NAF), Notice of Violation (NOV), Show Cause Order (SCO)
 | 25% less emission charge or Php 82.5/kg of PM, CO, NOX as NO2, SOX as SO2 |
| 1. Emissions must be 50% below the NESSSAP for pollutants monitored (Stack Sampling / CEMS) and two (2) or more issuances of the following within 5-years: PAB Case, Notice of Adverse Findings (NAF), Notice of Violation (NOV), Show Cause Order (SCO)
 | No incentive |

Section 12. Data Management

Owners or operators covered by this Order shall maintain for a period of at least five (5) years a record in a permanent form suitable for EMB inspection. The record shall be made available upon EMB request and shall include the following:

1. The EMB OPMS – PTO shall be the operating platform in generating MERS data and effectively implement the financial mechanism of the Emission Charge System (ECS).
2. Emission monitoring of other regulated pollutants to include flue gas flow and temperature. This shall include all calibration and maintenance records for the emission monitoring systems, consistent with the existing applicable and relevant rules and regulations such as DAO 2007-22 (Guidelines on the Requirements for Continuous Monitoring System (CEMS) and Other Acceptable Protocols, Thereby Modifying and Clarifying Certain Provisions of Section 5, Rule X of DAO 2000-81 and Other Related Provisions) and among others.

Section 13. Period of Compliance

All new/modified sources defined under Section 5 of RA 8749 are given one (1) year from the effectivity of this Order to comply.

Section 14. Separability Clause

If any provision of this Circular is declared not constitutional or not valid, the same shall not affect the validity of the other provisions.

Section 15. Repealing Clause

All orders, circulars and instructions inconsistent herewith are hereby repealed or amended accordingly.

Section 16. Effectivity

This Order shall take effect immediately fifteen (15) days after its publication in a newspaper or general circulation and submission to the Office of the National Administrative Registry (ONAR).