Technical Support Document

Regulation Proposal

7 DE Admin. Code 1109

"Emissions of Sulfur Compounds from Industrial Operations"

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Air Quality

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August 2024

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List of Acronyms

CAA	Clean Air Act
CFR	Code of Federal Regulations
DNREC	Department of Natural Resources and Environmental Control
EPA	U.S. Environmental Protection Agency
FR	Federal Register
GHG	Greenhouse Gas
NSPS	New Source Performance Standards
PPM	Parts Per Million
LB/HR	Pounds Per Hour
SIP	State Implementation Plan
SSM	Startup, Shutdown, and Malfunction
SO_2	Sulfur Dioxide

1.0 Introduction

The Division of Air Quality of the Department of Natural Resources and Environmental Control (DNREC) is proposing to amend 7 **DE Admin. Code** 1109, *Emissions of Sulfur Compounds from Industrial Operations*. Regulation 1109 sets air emission limits for sulfur dioxide (SO_2) from process operations, to protect public health and the environment.

2.0 Background

Under the Clean Air Act (CAA), states are required to implement plans for national primary and secondary ambient air quality standards, these plans are known as State Implementation Plans (SIP). Section 110(k)(5) of the CAA requires the U.S. Environmental Protection Agency (EPA) to determine the completeness of these plans.

A SIP is a federally enforceable plan that is developed by states to explain how they will comply with the CAA, in order to improve air quality. It is comprised of a collection of regulations and documents used by a state to demonstrate that they are protecting public health and the environment.

7 **DE Admin. Code** 1109 is part of Delaware's SIP. When regulations that are part of the SIP are amended, states are required to submit the proposed amendments to the EPA for approval. If the amendments are approved by EPA, they become part of the SIP become federally enforceable through 40 Code of Federal Regulations (CFR) Part 52, Subpart I - Delaware.[1]

[1] 40 CFR Part 52, Subpart I – Delaware. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-52/subpart-I

3.0 2015 Startup, Shutdown, & Malfunction State Implementation Call (SSM SIP CALL)

On June 30, 2011, the Sierra Club filed a petition with the EPA administrator, concerning emissions during periods of startup, shutdown or malfunction (SSM). A startup is the setting in operation of a source and a shutdown is the cessation of operation of a source. A malfunction is a sudden and unavoidable breakdown of process or control equipment. During periods of SSM, equipment is not running at peak efficiency, resulting in excess emissions during these times. Air pollution emitted during these periods may adversely impact the health of people nearby and contribute to smog and other problems in communities that are further downwind.

The Sierra Club petition included requests concerning the treatment of excess emissions during SSM; specifically, how those emissions are treated in SIP provisions that the EPA approved in the past. The CAA section 110(k)(5) provides a mechanism commonly called a "SIP Call" for correcting SIPs that the Administrator finds to be substantially inadequate to meet CAA requirements.

On June 12, 2015, EPA took final action on the Sierra Club petition; this final rule is commonly known as the 2015 SSM SIP Call [80 Federal Register (FR) 33840].[2] In the SIP Call, EPA asked states to ensure they had plans in place that require industrial facilities to follow air pollution rules during periods of SSM; specifically, how these emissions are treated in SIPs. In issuing the SIP Call action, the EPA directed states to correct specific SSM provisions in their SIPs, giving a SIP submission deadline of November 22, 2016. 7 **DE Admin. Code** 1109 was one of the Delaware regulations included in this SIP Call.

In the SSM SIP Call, the EPA found 7 **DE Admin. Code** 1109, Subsection 1.4 deficient because it provided a potential exemption from the emission limits in Sections 2.0 and 3.0 of the regulation, during SSM events:

> *"1.4 The provisions of this regulation shall not apply to the start-up and shutdown of equipment which operates continuously or in an extended steady state when emissions from such equipment during start-up and shutdown are governed by an operation permit issued pursuant to the provisions of 2.0 of 7 DE Admin. Code 1102.*
>
> ***2.0 Restrictions on Sulfuric Acid Manufacturing Operations***
>
> *2.1 No person shall cause or allow the emission of sulfur dioxide in the tail gases from any existing sulfuric acid manufacturing operation to exceed either a concentration of 1,000 parts per million by volume or a mass emission rate as specified in Table 2-1 of this regulation.*

[2] State Implementation Plans: Response to Petition for Rulemaking; Restatement and Update of EPA's SSM Policy Applicable to SIPs; Findings of Substantial Inadequacy; and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown and Malfunction. EPA Final Rule. 80 FR 33840. June 12, 2015. https://www.govinfo.gov/content/pkg/FR-2015-06-12/pdf/2015-12905.pdf

TABLE 2-1
ALLOWABLE MASS EMISSION RATE OF SULFUR DIOXIDE FROM EXISTING SULFURIC ACID MANUFACTURING OPERATIONS

Production Rate (Tons per Day)	Mass Emission Rate (Pounds per Hour)
100	75
300	210
500	345
700	480
900	615
1,100	750
1,300	885
1,500	1020

2.2 No person shall cause to be discharged into the atmosphere from any existing sulfuric acid plant any gases which contain acid mist, expressed as H2SO4, in excess of 0.25 g per kg of acid produced (0.5 lb per ton) the product being expressed as 100% H2SO4…

3.0 Restriction on Sulfur Recovery Operations

3.1 No person shall cause or allow the emission of sulfur dioxide in the tail gases from existing sulfur recovery operations to exceed either a concentration of 2,000 parts per million by volume or a mass emission rate as specified in Table 3-1 of this regulation."

TABLE 3-1
ALLOWABLE MASS EMISSION RATE OF SULFUR DIOXIDE FROM SULFUR RECOVERY OPERATIONS

Production Rate (Tons per Day)	Mass Emission Rate (Pounds per Hour)
50	425
100	550
200	800
300	1,050
400	1,300
500	1,550
600	1,800
700	2,050
800	2,300
900	2,550
1,000	2,300

3.1 Delaware's SSM SIP Call Response

On November 22, 2016, Delaware submitted a SIP revision, in response to EPA's SSM SIP Call. The SIP submittal proposed the removal of 7 **DE Admin Code.** 1109 from the SIP in its entirety, in order to remove the offending SSM exemption language from the SIP.

3.2 Retention of a "State Only" Regulation.

It should be noted, that Delaware did not agree with EPA's position that the SSM components of Delaware's SIP were deficient, in relation to the 2015 SSM SIP Call. Delaware's approach has been to require a permit for facilities that limits emissions during start-up and shutdown, and to subject the conditions of the permit to upfront environmental review, ample public scrutiny and demonstration that no National Ambient Air Quality Standards (NAAQS) would be violated if the permit conditions are met. Therefore, Delaware believed that the SSM components of its SIP were protective of the NAAQS and not deficient.

Despite this disagreement, in order to avoid the imposition of CAA sanctions (CAA 110(m) and 179(b)),[3] Delaware proposed to: 1) remove Regulation 1109 from the SIP as referenced above in Section 3.1 and 2) maintain Regulation 1109 as a "state only" regulation.

3.3 Disapproval of Delaware's SSM SIP Call Submittal for 1109

On October 23, 2023, EPA issued a final rule disapproving Delaware's November 22, 2016, SSM SIP Call submittal for Regulation 1109 (88 FR 72688).[4] EPA did not agree that a proper evaluation of the impacts of the removal was adequate, to ensure that the removal of the regulation from the SIP would not cause backsliding, in accordance with CAA Section 110(l).

Therefore, Delaware is proposing to amend Regulation 1109 in response to EPA's disapproval, to comply with 2015 SSM SIP Call, to remove SSM exemptions. These amendments are described in more detail in Section 4.0, below.

[3] The two types of sanctions are: 1) highway funding sanctions, which impose a funding moratorium for all but exempt projects (safety, mass transit) and 2) offsets, which require a ratio of at least 2:1 emissions reductions within a nonattainment area for new or modified major facilities undergoing New Source Review permitting.

[4] Air Plan Disapproval; Delaware; Removal of Excess Emissions Provisions. EPA Final Action. 88 FR72688. October 23, 2023. https://www.govinfo.gov/content/pkg/FR-2023-10-23/pdf/2023-23242.pdf

4.0 Current Proposed Amendments to DE Admin. Code 1109

The current proposed amendments address Section 1.0 "General Provisions". The intent of the new amendments is to remove the provisions for periods of start-up, shutdown, of equipment. Delaware's "state only" regulation and make the emission limit apply at all times, as shown below in the proposed regulation language:

> *"~~1.4 The provisions of this regulation shall not apply to the start up and shutdown of equipment which operates continuously or in an extended steady state when emissions from such equipment during start up and shutdown are governed by an operation permit issued pursuant to the provisions 2.0 of~~ **~~7 DE Admin. Code~~** ~~1102.~~"*

This action eliminates EPA's excess emissions concerns, as the current proposed amendment eliminates the SSM exemption, holding industrial operations to the emission limits in Regulation 1109, at all times.

5.0 Impact of Proposed Amendments

Regulation 1109 was promulgated to control the emissions of sulfur compounds from process operations. Regulation 1109 currently only applied to two facilities: the Veolia Sulfur Plant and the Delaware City Refinery. The paragraphs below describe the general impact of the proposed amendments on the two facilities.

5.1 Impact on Facilities

7 DE Admin**. Code** 1109, *Emissions of Sulfur Compounds from Industrial Operations* (Regulation 1109), was promulgated to control the emission of sulfur dioxide from industrial process operations. The regulation applies two facilities, the Veolia Red Lion Plan and the Delaware City Refinery.

5.1.1 Veolia Red Lion Plant

The Veolia Red Lion Plant is the only Sulfuric Acid Manufacturing facility in Delaware. Subsection 2.2 of Regulation 1109 includes an SO_2 limit for acid mist, in subsection 2.2 of Regulation 1109 is 0.5 lb/ton.

5.1.1.1 Standards of Performance for Sulfuric Acid Plants - 40 CFR Subpart H

40 CFR Part 60, Subpart H - *Standards of Performance for Sulfuric Acid Plants* applies to sulfuric acid production units which have commenced construction or modification after August 17, 1971.

The SO_2 standard for acid mist in Subpart H, Section 60.83(a)(1)[5], 0.15 lb/ton, is more stringent than the acid mist limit of 0.5 lb/ton in Regulation 1109. Therefore, Veolia Red Lion Plant is already complying with the proposed emission limit and new controls will not be needed or additional resources expended for this facility to comply with proposed amendments to Regulation 1109.

5.1.2 Delaware City Refinery

The Delaware City Refinery is the only facility in Delaware that currently has sulfur recovery operations. Condition 3.1 of Regulation 1109 includes a SO_2 emission rate for sulfur recovery operations of 2,000 parts per million (ppm) and Table 3-1 includes mass emission rate limits in pounds per hour (lb/hr).

5.1.2.1 Standards of Performance for Petroleum Refineries - 40 CFR Subpart J

40 CFR Part 60, Subpart J - *Standards of Performance for Petroleum Refineries* applies to the following types of units in petroleum refineries: fluid catalytic cracking unit catalyst regenerators, fuel gas combustion devices, and all Claus sulfur recovery plants except Claus plants with a design capacity for sulfur feed of 20 long tons per day (LTD) or less.

[5] 40 CFR Part 60, Subpart H. Section 60.83 https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-60/subpart-H/section-60.83

The least stringent ppm limit in Subpart J, Section 60.104[6] is 300 ppm, which is more stringent than the 2,000 ppm limit in Regulation 1109. Therefore, the Delaware City Refinery is already complying with the proposed SSM emission limit and new controls will not be needed or additional resources expended for this facility to comply with proposed amendments to Regulation 1109.

5.1.3 Conclusion

To summarize, the following, more stringent, Federal regulations already exist for the sources covered by this regulation:

- 40 CFR Part 60, Subpart H - *Standards of Performance for Sulfuric Acid Plants*
- 40 CFR Part 60, Subpart J - *Standards of Performance for Petroleum Refineries*

Therefore, it is expected that the sources will not need to install new controls or expend additional resources to comply with the proposed amendments to Regulation 1109. In addition, since the sources are already required to meet the proposed emission limits in 1109, substantial emission reductions are not expected to result from the promulgation of the amendments.

5.2 Impact on Delaware's Greenhouse Gas Emissions Reduction Targets

Regulation 1109 regulates emissions of SO_2 from process facilities. SO_2 is a precursor to greenhouse gasses (GHG). Therefore, a reduction in SO_2 emission limits from process facilities, would likely result in an associated reduction in greenhouse gas emissions.

DNREC is required to review the impacts that proposed regulatory amendments have on the State of Delaware's GHG emission reduction targets, in accordance with 7 Del.C. §10003[7] and 29 Del.C. §10118(b)(3).[8] As detailed in Section 5.1 above, the amendments are not expected to result in any substantial emissions reductions or increases of SO_2; because more stringent Federal and state regulations or permits already exist for the two sources. Therefore, the impact of this regulation on the achievement of the State of Delaware's greenhouse gas emissions reduction targets is expected to be de minimis.

5.3 Impact on Communities

In addition, the proposed amendments are not expected to impact overburdened or underserved communities located in Delaware, as the amendments are not expected to result in any substantial emissions reductions or increases, as detailed in Section 5.1.

[6] 40 CFR Part 60, Subpart J, Section 60.104. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-60/subpart-J/section-60.104
[7] Greenhouse gas emissions reductions. 7 Del.C. §10003. https://delcode.delaware.gov/title7/c100/index.html
[8] Agency findings; form of regulations. 29 Del.C. §10118(b)(3). https://delcode.delaware.gov/title29/c101/sc02/index.html