

(Version August 9, 2024)

**PROPOSED CONTROL OF NOX EMISSIONS FROM NITRIC ACID TANKS
RULE 1159.1**

[Rule Index to be included after adoption]

(a) Purpose

The purpose of this rule is to reduce emissions of Nitrogen Oxide (NO_x) from Nitric Acid Units.

(b) Applicability

This rule applies to owners and/or operators of facilities with one or more Nitric Acid Unit(s).

(c) Definitions

For purposes of this rule the following definitions shall apply:

- (1) AIR POLLUTION CONTROL DEVICE (APCD) means an add-on air pollution control device that controls NO_x Emissions from one or more Nitric Acid Units.
- (2) CLEANING TANK means a tank containing nitric acid used to remove surface contaminants from parts where nitric acid is not intended to react with a metal.
- (3) EXCEEDANCE YEAR means a calendar year when the adjusted additions of nitric acid into Nitric Acid Unit(s) exceed either threshold specified in clause (d)(2)(B)(i) or (d)(2)(B)(ii).
- (4) NITRIC ACID UNIT means tank, reactor, vessel, or other container containing nitric acid, where nitric acid either reacts with a metal or decomposes at a temperature greater than 1700-degree Fahrenheit, that has been issued or is required to obtain a South Coast AQMD permit. A Nitric Acid Unit does not include a container used exclusively to store nitric acid, a Cleaning Tank, or a Rinse Tank.
- (5) NO_x EMISSIONS means the sum of nitric oxide and nitrogen dioxide emitted, calculated and expressed as nitrogen dioxide.
- (6) PROCESS LINE means a series of tanks, including Nitric Acid Unit(s), necessary to conduct a specific process at the facility.
- (7) RINSE TANK means any tank where a part is partially or fully submerged into a liquid to remove any residual solution from a Nitric Acid Unit or a Cleaning Tank.

(d) Nitric Acid Unit Requirements

(1) Nitric Acid Units Vented to an APCD

(A) Performance Standards for APCDs

Beginning the date specified in *Table 1 – Implementation Schedule*, an owner or operator of a Nitric Acid Unit shall collect and vent emissions to an APCD(s) that meets one of the following requirements demonstrated by a source test report(s) conducted pursuant to subdivision (h):

(i) An overall NO_x Emission rate from the combined Nitric Acid Unit(s) vented to the APCD at or below 0.30 pounds per hour (lb/hr); or

(ii) A NO_x control efficiency of 99%; and

(B) Submittals of Permit Applications

Pursuant to the date specified in *Table 1 – Implementation Schedule* an owner or operator of a new or modified APCD shall submit a complete South Coast AQMD permit application for the APCD that meets the requirements in subparagraph (d)(1)(A).

(2) Nitric Acid Units Not Vented to APCD - Alternative Compliance Pathways

In lieu of meeting the requirements in paragraph (d)(1), an owner or operator of a Nitric Acid Unit shall comply with at least one of the following beginning the date specified in *Table 1 – Implementation Schedule*:

(A) Source Testing

Demonstrate that the combined NO_x Emission rate from all Nitric Acid Unit(s) at the facility that are not vented to APCD complying with (d)(1) and, if applicable, (d)(2)(B) and (d)(3) do not exceed 0.60 lb/hr by submitting a source test report(s) conducted pursuant to subdivision (h); and/or

(B) Recording Additions to Nitric Acid Units with a Permit to Operate Issued on or before [Date of Adoption]

Demonstrate that the adjusted additions to Nitric Acid Unit(s) do not exceed the following thresholds for any two calendar years of the most recent five calendar year period, including the current calendar year, as determined pursuant to paragraph (g)(2) and *Appendix A – Nitric Acid Additions and Adjustments*:

- (i) 550 gallons of nitric acid calculated at 68 WT% per calendar year per Nitric Acid Unit; and
 - (ii) 1650 gallons of nitric acid calculated at 68 WT% per calendar year for all Nitric Acid Units.
- (3) Facilities with Multiple APCDs Complying with Clause (d)(1)(A)(i)
Beginning the date specified in *Table 1 – Implementation Schedule*, an owner or operator of two or more APCDs electing to comply with the requirements of clause (d)(1)(A)(i) in lieu of clause (d)(1)(A)(ii) shall demonstrate that the combined NOx Emission rates for all Nitric Acid Units vented to the APCDs subject to subparagraph (d)(1)(A) do not exceed 0.90 lb/hr by submitting a source test report(s) conducted pursuant to subdivision (h).

Table 1 – Implementation Schedule

Date Initial Permit to Operate Issued for Nitric Acid Unit	Rule Requirement	Compliance Date
On or before [Date of Adoption]	(d)(1)(B); (d)(2)(A); and (d)(2)(B);	January 1, 2026
	(d)(1)(A) and (d)(3)	January 1, 2028
After [Date of Adoption]	(d)(1)(A) and (d)(3)	Beginning 120 days after initial operation of the APCD
	(d)(2)(A)*	Beginning 120 days after initial operation of Nitric Acid Unit

**(d)(2)(B) is not a compliance option for Nitric Acid Units with Permit to Operate issued after [Date of Adoption]*

- (4) Labeling of Tanks
Beginning July 1, 2025, an owner or operator of a Nitric Acid Unit shall maintain clear labeling for the following equipment:
- (A) Nitric Acid Unit(s) with the tank number, if applicable, and South Coast AQMD application or permit number; and
 - (B) Cleaning Tanks with the South Coast AQMD tank number, if applicable, the label “Rule 1159.1 Cleaning Tank,” and South Coast AQMD permit number.

- (e) Facilities Exceeding 550-gallon Individual or 1650-gallon for all Nitric Acid Units Threshold

Pursuant to the schedule specified in *Table 2 – Implementation Schedule for Facilities Exceeding Usage Threshold*, an owner or operator of a Nitric Acid Unit electing to comply with subparagraph (d)(2)(B) that exceeds either threshold specified in clause (d)(2)(B)(i) or (d)(2)(B)(ii) for any two calendar years within a five calendar year period shall meet the requirements of paragraph (d)(1) or subparagraph (d)(2)(A) for all Nitric Acid Unit(s) previously complying with subparagraph (d)(2)(B).

Table 2 – Implementation Schedule for Facilities Exceeding Usage Threshold

Applicability	Rule Requirement	Effective Date
Facilities required to comply with Subdivision (e)	(d)(1)(B)	No later than 18 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year
	(d)(1)(A)	No later than 36 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year
	(d)(2)(A)	Beginning 18 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year

- (f) Inspection and Maintenance of Air Pollution Control Device
An owner or operator of an APCD shall:
 - (1) Conduct visual inspections for leaks and malfunctions on the APCD per the manufacturer’s recommended schedule or at least once every quarter, whichever is more frequent; and
 - (2) Maintain and operate the APCD in accordance with manufacturer’s specifications and recommendations.

- (g) Monitoring, Recordkeeping, and Reporting Requirements
 - (1) APCD Monitoring Requirements

Beginning January 1, 2025, an owner or operator of a Nitric Acid Unit shall monitor and record the following parameters for each APCD at least weekly for each week the APCD operates:

- (A) Flowrate of scrubber solution for each stage of the APCD, if equipped with a flowmeter(s);
 - (B) pH of the scrubber solution for each stage of the APCD, if applicable; and
 - (C) Pressure drop across each stage of the APCD, if equipped with a magnehelic gauge(s).
- (2) Recordkeeping Requirements for Facilities Complying with Paragraph (d)(2)(B)

An owner or operator of a Nitric Acid Unit electing to meet the requirements of paragraph (d)(2)(B) shall:

- (A) Additions of Nitric Acid
Beginning July 1, 2025, record for each addition of nitric acid made to the Nitric Acid Unit(s) the following:
 - (i) Date of the addition;
 - (ii) Volume of the addition, in gallons;
 - (iii) Concentration of nitric acid in the addition based on either:
 - (I) Highest concentration listed on the manufacturer's Safety Data Sheet (SDS); or
 - (II) Chemical analysis of a sample; and
 - (iv) Volume of addition, calculated at 68 WT% pursuant to *Appendix A – Nitric Acid Additions and Adjustments*;
- (B) Optional Nitric Acid Removal Adjustments
Beginning July 1, 2025, if deducting the amount of nitric acid unreacted with a metal and removed from a Nitric Acid Unit(s), record the following information for each removal of unreacted nitric acid:
 - (i) Date of the removal;
 - (ii) Volume of the removal, in gallons;
 - (iii) Concentration of nitric acid removed as determined by chemical analysis; and
 - (iv) Volume of nitric acid removed, calculated at 68 WT% pursuant to *Appendix A – Nitric Acid Additions and Adjustments*;
- (C) Beginning July 1, 2025, retain:

- (i) SDS or sample analysis report for each addition of nitric acid recorded pursuant to subparagraph (g)(2)(A); and
 - (ii) Sample analysis report of the sample for each nitric acid removal recorded pursuant to subparagraph (g)(2)(B);
- (D) Monthly Records of Additions to Nitric Acid Units
Beginning July 1, 2025, record the adjusted additions of nitric acid at 68 WT% per month for each Nitric Acid Unit and all Nitric Acid Units(s), calculated pursuant to *Appendix A – Nitric Acid Additions and Adjustments* and recorded pursuant to *Appendix B – Recordkeeping Form* no later than 7 days after each calendar month.
- (E) Annual Records of Additions to Nitric Acid Units
Beginning January 1, 2026, record the adjusted additions of nitric acid at 68 WT% per the preceding calendar year for each Nitric Acid Unit and all Nitric Acid Units(s), calculated pursuant to *Appendix A – Nitric Acid Additions and Adjustments* and recorded pursuant to *Appendix B – Recordkeeping Form* no later than February 1 of each year.
- (3) Compliance Pathway for Nitric Acid Units
Beginning July 1, 2025, an owner or operator of a Nitric Acid Unit shall maintain a list of the Nitric Acid Units with the following information:
 - (A) South Coast AQMD application or permit number;
 - (B) Tank number and name; and
 - (C) Elected compliance pathway for each Nitric Acid Unit, either subparagraph (d)(1)(A), (d)(2)(A), or (d)(2)(B).
- (4) Record Retention Requirements
All records shall be maintained and kept on site for at least five years and made available to the Executive Officer upon request.
- (h) Source Testing Requirements and Test Methods
 - (1) Submittal of Source Test Protocol Prior to Source Testing
Prior to conducting a source test to demonstrate compliance with the requirement in clause (d)(1)(A)(i), (d)(1)(A)(ii), or subparagraph (d)(2)(A), the owner or operator of a Nitric Acid Unit shall submit a source test protocol with the information specified in paragraph (h)(2) or (h)(3), as applicable, to sourcetesting@aqmd.gov or a South Coast AQMD web portal for approval.
 - (2) Protocol for Source Tests for Nitric Acid Units Equipped with an APCD

An owner or operator of a Nitric Acid Unit demonstrating compliance with the requirement in clause (d)(1)(A)(i) or (d)(1)(A)(ii) shall submit a source test protocol to sourcetesting@aqmd.gov or a South Coast AQMD web portal that includes:

- (A) Facility information;
- (B) Description of the operations to be tested;
- (C) Parameters being measured;
- (D) Source test methods used pursuant to:
 - (i) Method 100.1 – Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989); and
 - (ii) South Coast AQMD Methods 1.1-4.1 to determine stack gas flowrate
- (E) Design criteria and the ventilation parameters;
- (F) The number of test runs;
- (G) Test conditions that represent normal operations of the Nitric Acid Unit(s); and
- (H) South Coast AQMD permits for the Nitric Acid Unit(s) controlled by the APCD.

(3) Protocol for Source Tests for Nitric Acid Units Not Equipped with an APCD

An owner or operator of a Nitric Acid Unit demonstrating compliance with the requirement in subparagraph (d)(2)(A) shall submit a source test protocol to sourcetesting@aqmd.gov or a South Coast AQMD web portal that includes:

- (A) Information specified in subparagraphs (h)(2)(A) through (F) and South Coast AQMD permit for the Nitric Acid Unit(s); and
- (B) Test conditions that represent maximum operations of the Nitric Acid Unit(s): highest temperature, highest nitric acid concentration, throughput, and most reactive metal or as approved in the source test protocol.

(4) Conducting of Source Tests

An owner or operator of a Nitric Acid Unit required to meet the requirements in clause (d)(1)(A)(i), (d)(1)(A)(ii), or subparagraph (d)(2)(A), shall conduct a single run source test:

- (A) According to the most recently approved source test protocol for the APCD or Nitric Acid Unit(s);

- (B) If conducting a source test for an APCD, confirming operations of the APCD is consistent with the design and operational conditions specified in its SCAQMD approved permit; and
 - (C) If conducting a source test for a Nitric Acid Unit(s) not equipped with an APCD, confirming proper collection and quantification consistent with the applicable testing procedures specified in *Measurement of Hexavalent Chromium Emissions from Chromium Plating and Chromic Anodizing Operations for Certification of Wetting Agent Chemical Mist Suppressants Subject to SCAQMD Rule 1469* (2013) or other SCAQMD approved method.
- (5) **Periodic Source Testing for APCDs**
No later than five calendar years from the last source test that demonstrated compliance with the requirement in clause (d)(1)(A)(i) or (d)(1)(A)(ii), an owner or operator of a APCD shall conduct a subsequent source test pursuant to paragraph (h)(4).
- (6) **Submittal of Final Source Test Report**
No later than 60 days after date source test was conducted, an owner or operator of a Nitric Acid Unit shall submit the complete final source test report to sourcetesting@aqmd.gov or a South Coast AQMD web portal.

Appendix A – Nitric Acid Additions and Adjustments

1. Applicability

This appendix specifies the methodology for calculating the annual additions of nitric acid containing chemicals to a Nitric Acid Unit(s) not equipped with an APCD to determine eligibility for the compliance option specified in subparagraph (d)(2)(B).

2. Nitric Acid Additions

The amount of chemicals containing nitric acid added, including those that are new or recycled, for each Nitric Acid Unit shall be determined as follows:

- A. For each addition, measure and record the volume, in gallons, of the nitric acid solution added to each Nitric Acid Unit;
- B. For each addition, determine and record the WT% of nitric acid solution to be added. If WT% is not available, convert from 100 VOL% to 100 WT% (see Example 1 below);
- C. For each addition, calculate the equivalent volume (gallons at 68 WT%) using the density;
- D. Add each addition (gallons at 68 WT%) made within the calendar month to determine the amount of monthly additions;
- E. Add each monthly addition (gallons at 68 WT%) to determine the amount of annual additions.

Example 1: Addition of a 40 VOL% Nitric Acid

Step A

70 gallons of nitric acid with a concentration at 40 VOL% were added to a Nitric Acid Unit each month for one calendar year; the facility has 1 Nitric Acid Unit.

Step B

$$(70 \text{ gallons}_{40 \text{ VOL}\%}) * \frac{2 \text{ gallon}_{100 \text{ VOL}\%}}{5 \text{ gallon}_{40 \text{ VOL}\%}} = 28 \text{ gallons}_{100 \text{ VOL}\%}$$

$$28 \text{ gallons}_{100 \text{ VOL}\%} = 28 \text{ gallons}_{100 \text{ WT}\%}$$

Step C

Density of 68 WT% Nitric Acid = 11.7 lb/gal

Density of 100 WT% Nitric Acid = 12.6 lb/gal
 $(28 \text{ gallons}_{100 \text{ WT}\%}) * [(12.6 \text{ lb/gal}) / (11.7 \text{ lb/gal})] = 30.2 \text{ gallons of 68 WT\% nitric acid added}$

Step D

(30.2 gallons of 68 WT% nitric acid added) * 1 = 30.2 gallons of 68 WT% nitric acid was added monthly

Step E

(30.2 gallons_{68 WT%}) * 12 = 362.4 gallons of 68 WT% nitric acid added annually

3. Nitric Acid Removal Adjustments (Optional)

The amount of nitric acid removed from a Nitric Acid Unit shall be determined as follows:

- A. For each removal, measure and record the volume of the nitric acid solution removed from each Nitric Acid Unit;
- B. For each removal, determine and record the WT% of nitric acid solution removed via chemical analysis. If WT% is not available, convert from 100 VOL% to 100 WT% (see Example 2 below);
- C. For each removal, calculate the equivalent volume (gallons at 68 WT%) using the density;
- D. Add each removal (gallons at 68 WT%) made within the calendar month to determine the amount of monthly reductions;
- E. Add each monthly reduction (gallons at 68 WT%) to determine the amount of annual removal adjustment.

Example 2: Removal of a 20 VOL% Nitric Acid

Step A

10 gallons of nitric acid with a concentration at 20 VOL% was removed from a Nitric Acid Unit twice each month for one calendar year; the facility has 1 Nitric Acid Unit.

Step B

$$(10 \text{ gallons}_{20 \text{ VOL}\%}) * \frac{1 \text{ gallon}_{100 \text{ VOL}\%}}{5 \text{ gallon}_{20 \text{ VOL}\%}} = 2 \text{ gallons}_{100 \text{ VOL}\%}$$

$$2 \text{ gallons}_{100 \text{ VOL}\%} = 2 \text{ gallons}_{100 \text{ WT}\%}$$

Step C

Density of 68 WT% Nitric Acid = 11.7 lb/gal

Density of 100 WT% Nitric Acid = 12.6 lb/gal

$$(2 \text{ gallons}_{100 \text{ WT}\%}) * [(12.6 \text{ lb/gal}) / (11.7 \text{ lb/gal})] = 2.15 \text{ gallons of 68 WT\% nitric acid removed}$$

Step D

$(2.15 \text{ gallons of } 68 \text{ WT\% nitric acid removed}) * 2 = 4.3 \text{ gallons of } 68 \text{ WT\% nitric acid was removed monthly}$

Step E

$(4.3 \text{ gallons}_{68 \text{ WT\%}}) * 12 = 51.6 \text{ gallons of } 68 \text{ WT\% nitric acid removed annually}$

4. Annual Adjusted Nitric Acid Additions

The total amount of annual nitric acid additions to a Nitric Acid Unit(s) not equipped with an APCD to determine eligibility for compliance option specified in clause (d)(3)(C) shall be determined as follows:

- A. Determine the total annual amount of nitric acid added per calendar year, both new and recycled;
- B. Determine the total annual amount of nitric acid removed per calendar year (optional);
- C. Subtract the total annual amount of nitric acid removed from the total annual amount of nitric acid added to determine the amount of annual adjusted additions.

Example 3: Annual Additions of 40 VOL% Nitric Acid and Removal of 20 VOL% Nitric Acid that Incorporates Numbers Derived from Examples 1 and 2

Step A

362.4 gallons of 68 WT% nitric acid added annually

Step B

51.6 gallons of 68 WT% nitric acid removed annually

Step C

$(362.4 \text{ gallons}_{68 \text{ WT\%}} \text{ added annually}) - (51.6 \text{ gallons}_{68 \text{ WT\%}} \text{ removed annually}) = 310.84 \text{ gallons of annual adjusted } 68 \text{ WT\% nitric acid additions}$

Appendix B – Recordkeeping Form

Form A - South Coast AQMD Rule 1159.1 Recordkeeping Form
for Each Nitric Acid Unit*

Facility ID and Name:			
Tank Number:			
Year:			
	Additions @ 68 WT% (gallons)	Optional Removal Adjustments @ 68 WT% (gallons)	Adjusted Nitric Acid Additions (gallons)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Annual Adjusted Nitric Acid Addition			

Is the Annual Adjusted Nitric Acid Addition below 550 gallons? Yes No

If any two calendar years within a five-calendar year period where the above threshold is exceeded, South Coast AQMD Rule 1159.1 subdivision (e) applies.

**Use one Form A for each Nitric Acid Unit electing to comply with subparagraph (d)(2)(B)*

Appendix B – Recordkeeping Form (continued)

Form B - South Coast AQMD Rule 1159.1 Recordkeeping Form for
Facility-Wide Nitric Acid Usage

Facility ID and Name:			
Year:			
	Additions @ 68 WT% (gallons)*	Optional Removal Adjustments @ 68 WT% (gallons)*	Adjusted Nitric Acid Additions (gallons)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Annual Adjusted Nitric Acid Addition			

Is the Annual Adjusted Nitric Acid Addition below 1650 gallons? Yes No

If any two calendar years within a five-calendar year period where the above threshold is exceeded, South Coast AQMD Rule 1159.1 subdivision (e) applies.

**Total volume from all applicable Nitric Acid Unit(s) electing to comply with subparagraph (d)(2)(B)*