



PUBLIC WORKSHOP FOR PROPOSED RULE 1159.1 - CONTROL OF NO_x EMISSIONS FROM NITRIC ACID TANKS

South Coast AQMD
September 25, 2024
3:00 PM

Zoom webinar link:

<https://scaqmd.zoom.us/j/95812953504>

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Dial-in Number: +1 669 900 6833

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Agenda



Proposed Rule 1159.1 Background



Preliminary Draft Rule Language



NOX Emissions and Emission Reductions



CEQA & Socioeconomic Impacts of PR 1159.1



Next Steps

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PROPOSED RULE 1159.1 BACKGROUND

Background

- 2016 Air Quality Management Plan (AQMP)
 - 5 tons per day NO_x reduction to be achieved with Best Available Retrofit Control Technology (BARCT) by 2025
 - Transitioning REgional Clean Air Incentives Market (RECLAIM) facilities to command-and-control
- Assembly Bill 617
 - Applicable to facilities in the state greenhouse cap and trade program
 - Requires expedited BARCT implementation by December 31, 2023 with higher priority given to older, higher polluting sources
- 2022 AQMP
 - Adopted December 2022
 - Establishes new health-based cost-effectiveness threshold (increased from \$50,000 to \$325,000 per ton of NO_x reduced)

Proposed Rule 1159.1 (PR 1159.1)

- PR 1159.1 will establish Best Available Retrofit Control Technology (BARCT) requirements and reduce NOx emissions from nitric acid units found in various industries including
 - Metal finishing
 - Precious metal reclamation
 - Expanded graphite foil production
- PR 1159.1 will be applicable to RECLAIM, former RECLAIM and non-RECLAIM facilities

11 RECLAIM Facilities	244 Non-RECLAIM Facilities
<ul style="list-style-type: none">• 1 precious metal reclamation• 9 metal finishing• 1 expanded graphite foil production	<ul style="list-style-type: none">• 1 precious metal reclamation• 243 metal finishing
About 928 nitric acid units	

PR 1159.1 Rule Development Timeline

PR 1159.1 rule development began in 2021

- Five working group meetings with stakeholders
- Public workshop in September 2022
- Key requirements based on 2016 AQMP NO_x cost-effectiveness threshold

2022 AQMP included a change in cost-effectiveness threshold

- PR 1159.1 rulemaking paused to reevaluate impacts to facilities
- Additional information collected from facilities and vendors to update cost-effectiveness analysis

Working Group Meeting # 6 (April 2024) and Working Group Meeting #7 (August 2024)

- Presented updates and revisions to the rule
- New approaches with updated thresholds
- Addressed concerns from stakeholders

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PRELIMINARY DRAFT RULE LANGUAGE

PR 1159.1 Structure

2024

(a) Purpose

(b) Applicability

(c) Definitions

(d) Nitric Acid Unit Requirements

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

(f) Inspection and Maintenance of Air Pollution Control Device

(g) Monitoring and Recordkeeping Requirements

(h) Source Testing Requirements and Test Methods

(i) Exemptions

Appendices (A/B)

Purpose (a)

The purpose of this rule is to reduce emissions of nitrogen oxides from Nitric Acid Units.

Applicability (b)

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

- PR 1159.1 includes a subdivision to state the purpose of the rule
- Specifies facilities subject to rule based on equipment

Definitions (c)

Defined terms are capitalized in rule language for clarity

- (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.
- (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 or a Rinse Tank.
- (6) **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.

- Nitric Acid Unit is defined to clarify applicability of PR 1159.1
- Cleaning Tank
 - NOx emissions are not anticipated to be generated
 - PR 1159.1 provides an exemption process from key requirements based on permit description
- Rinse Tank
 - Not a Nitric Acid Unit

Definitions (c)

- (1) AIR POLLUTION CONTROL DEVICE (APCD) means an equipment or multiple pieces of equipment in series that control NOx Emissions from one or more Nitric Acid Units. An APCD would begin at the point where emissions are collected from a Nitric Acid Unit to the point where emissions are discharged into the air from an exhaust stack.
- (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).

- APCD
 - Equipment that controls NOx emissions
 - May be multiple equipment that work as a system (e.g., mesh pads, scrubber towers, or mist eliminator)
 - May vent one or more units
- Exceedance Year
 - Calendar Year where an addition threshold was exceeded
 - Can be a partial calendar year (e.g., January 2029-July 2029)

Requirements (d)(1)&(d)(3) – Pathway A - APCD

Key dates found on Table 1

(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 that meets the requirements in subdivision (h):

- (i) An overall NO_x Emissions 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) Submittal of Permit Applications

Pursuant to the date specified in *Table 1 – Implementation Schedule* an owner or operator of a Nitric Acid Unit not equipped with an APCD or a Nitric Acid Unit equipped with an existing APCD required to be modified to meet the performance standards specified in clause (d)(1)(A)(i) or (d)(1)(A)(ii) shall submit a complete South Coast AQMD permit application for the APCD that meets the requirements in subparagraph (d)(1)(A).

- Specifies performance standard for APCDs
 - NO_x emission rate of ≤ 0.30 lb/hr determined to be technologically feasible; or
 - NO_x control efficiency of ≥ 99% compliance option requested by stakeholder

Requirements (d)(3) – Pathway A - APCD

Key dates found on Table 1

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 NO_x Emissions rates for all Nitric Acid Units vented to APCDs subject to subparagraph (d)(1)(A) do not exceed 0.90 lb/hr demonstrated by a source test that meets the requirements in subdivision (h).

- Facility-wide ≤ 0.90 lb/hr
 - Only applies to APCD(s) complying with ≤ 0.30 lb/hr
 - Based on PR 1159.1 facility with most APCDs allowed to operate at same time

Requirements (d)(2)(A) – Pathway B – Source Test

(2) Nitric Acid Units – 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 pursuant to the schedule specified in *Table 1 – Implementation Schedule*:

(A) Source Testing

- (i) Demonstrate all Nitric Acid Unit(s) at the facility electing to comply with subparagraph (d)(2)(A) do not exceed an overall NO_x Emissions rate of 0.60 lb/hr, demonstrated by a source test that meets the requirements in subdivision (h);
- (ii) Not process a part containing a metal or metal alloy in a Nitric Acid Unit electing to comply with subparagraph (d)(2)(A), unless all metal(s) with 10.5 percent or greater of the part have been evaluated by an approved source test that demonstrates compliance with clause (d)(2)(A)(i); and
- (iii) Submit a complete South Coast AQMD permit application for each Nitric Acid Unit electing to comply with subparagraph (d)(2)(A) to include maximum operating conditions based on testing conditions during an approved source test that demonstrates compliance with clause (d)(2)(A)(i) that include:
 - (I) Operating temperature;
 - (II) Nitric acid concentration;
 - (III) Number of parts; and
 - (IV) List of metals with 10.5 percent or greater and the corresponding maximum percentage; or

Alternative pathway to *Pathway A - APCD* by source testing uncontrolled emissions for all units using this pathway

- ≤ 0.60 lb/hr combined
 - Tested at maximum operating conditions
 - Unit with APCD allowed, tested at inlet of APCD
-
- Permit conditions limit operating conditions to be at or below source testing conditions
 - Ensures NO_x emissions will be at or below the source tested emission rate

Example 1 – Pathway B: Source Test Parameters

Range of Parameters during Normal Operations

- Number of parts: *3-10 parts*
- Nitric acid concentration: *25-45 WT%*
- Temperature: *101-145 degrees F*
- Processes alloyed parts composed of:
 - *Alloy X: Iron 70-75%, Chromium 10-15%, Cadmium 2-8%, Cobalt 0-5%*
 - *Alloy Y: Nickel 50-55%, Iron 30-40%, Chromium 10-15%*
 - *Alloy Z: Iron 30-35%, Nickel 30-35%, Chromium 10-15%, Cadmium 5-9%, Cobalt 5-9%*

Maximum Operations tested during Source Test

- Number of parts: *10 parts*
- Nitric acid concentration: *45 WT%*
- Temperature: *145 degrees F*
- Evaluate: *Alloy X and Alloy Y*

- Metals in alloys less than 10.5% are not required to be evaluated
- If Alloy X and Alloy Y are evaluated in a source test, Alloy Z is not required to be tested because the percentages of iron, nickel and chromium in Alloy X and Alloy Y are greater than or equal to those in Alloy Z
- Alternatively, a source test could be conducted using pieces of a metal comprised completely of iron, nickel, or chromium

Example 2 – Pathway B: Determination of Facility-wide Emission Rate

Alloy Type	Composition	Unit 1	Unit 2	Unit 3	Facility-Wide Emission Rate
Alloy A (2025 Test)	98% Iron	0.15 lb/hr	0.25 lb/hr	0.01 lb/hr	
Alloy B (2025 Test)	80% nickel and 20% chromium	0.25 lb/hr	0.20 lb/hr	0.01 lb/hr	
Emission Rate for Nitric Acid Units at Facility (2025)		0.25 lb/hr	0.25 lb/hr	0.01 lb/hr	0.52 lb/hr
Alloy Type	Composition	Unit 1	Unit 2	Unit 3	Facility-Wide Emission Rate
Alloy C (Subsequent 2026 Test)	98% Titanium	0.15 lb/hr	0.15 lb/hr	0.05 lb/hr	
Emission Rate for Nitric Acid Units at Facility (2026)		0.25 lb/hr	0.25 lb/hr	0.05 lb/hr	0.55 lb/hr

Recordkeeping Requirements (d)(2)(B) – Pathway C

(2) Nitric Acid Units – 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 pursuant to the schedule specified in *Table 1 – Implementation Schedule*:

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

Demonstrate for all Nitric Acid Unit(s) at the facility electing to comply with subparagraph (d)(2)(B) that no more than one calendar year of the most recent five calendar year period, including the current calendar year, exceed the adjusted additions to Nitric Acid Unit(s), as determined pursuant to paragraph (g)(2) and *Appendix A – Nitric Acid Additions and Adjustments*:

- (i) 550 gallons of nitric acid calculated at 68 weight percent (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 at the facility electing to comply with subparagraph (d)(2)(B).

Alternative pathway to
Pathway A – APCD by
Recordkeeping of nitric acid
additions

- Calendar year limits:
 - 550 gallons per unit
 - 1,650 gallons facility-wide
 - Removal adjustments allowed (Appendix A)
- Unit with APCD allowed
- Not applicable for new units

Two calendar year
exceedances in last five
years triggers subdivision (e)

- First exceedance allows time for facility to plan ahead with no violation
- Facility no longer eligible for this pathway following exceedances

Table 1 – Implementation Schedule

Implementation Schedule

- Compliance deadline of the Nitric Acid Unit falls under two main categories:
 - If the units(s) are issued a permit on or before date of rule adoption
 - If the units(s) are issued a permit after date of rule adoption
 - Recordkeeping pathway not an option

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)(i) or (d)(2)(A)(iii)	No later than January 1, 2026
	(d)(2)(A)(ii), or (d)(2)(B)	Beginning January 1, 2026
	(d)(1)(A) and (d)(3)	Beginning 12 months after a permit to construct for an APCD is issued to meet the requirements of paragraph (d)(1)(B) unless an extension is granted, or Beginning January 1, 2029, whichever is earlier ¹
After [Date of Adoption] ²	(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

PR 1159.1 Compliance Pathway Summary

- Each nitric acid unit at facility would comply with one of the following:

Pathway A:

(d)(1) –
APCD

OR

Pathway B:

(d)(2)(A) –
Source Test

OR

Pathway C:

(d)(2)(B) –
Recordkeeping

Thresholds
Per unit: 550 gal/yr
Per facility: 1650 gal/yr

EXCEED THRESHOLD*
(loss of Pathway C)

DOES NOT EXCEED THRESHOLD –
no further action

(d)(1) –
APCD

(d)(2)(A) –
Source Test

* Two calendar years of last five years, beginning July 1, 2025

PR 1159.1 Compliance Pathways Example

<i>Sample Facility A</i>	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Jan 2025	No APCD	No APCD	No APCD	No APCD	No APCD
Elected Compliance Pathway	<i>Pathway A – APCD</i>	<i>Pathway B – Source Test</i>	<i>Pathway B – Source Test</i>	<i>Pathway C – Recordkeeping</i>	<i>Pathway C – Recordkeeping</i>
July 2025	-	-	-	begin recordkeeping of additions and removal adjustments	
Jan 2026	submit APCD application	submit a source test report showing 0.25 lb/hr and permit application	submit a source test report showing 0.20 lb/hr and permit application	450 gal (2025)	500 gal (2025)
Category Evaluation	-	0.45 lb/hr (below combined emission rate of 0.60 lbs/hr)		950 gal (2025) (below individual and facility wide additions of 550 and 1650 gal)	
Next Steps	install APCD	-	-	maintain recordkeeping	maintain recordkeeping

Labeling Requirements (d)(4)

(4) Labeling of Tanks

Beginning July 1, 2025, an owner or operator of a Nitric Acid Unit shall maintain clear labeling on each Nitric Acid Unit:

- (A) Specifying the tank name or other identifier and South Coast AQMD application or permit number, unless the Nitric Acid Unit is subject to the labeling requirements specified in paragraph (f)(5) of Rule 1426 – Emissions from Metal Finishing Operations or paragraph (g)(3) of Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations; and
- (B) With “Rule 1159.1 Cleaning Tank” for each Cleaning Tank.

Labeling requirements for:

- Nitric Acid Units
- Cleaning Tanks

Nitric Acid Units subject to Rule 1426/1469 labeling requirements are exempt from PR 1159.1 labeling requirement, except for Cleaning Tanks

Threshold Exceedances – (e)

(1) Ineligible for Compliance Pathway (d)(2)(B)
 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 exceeded 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 thereafter 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 ¹	Effective Date
Facilities required to comply with Subdivision (e)	(d)(1)(B), (d)(2)(A)(i), or (d)(2)(A)(ii)	No later than 12 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year
	(d)(1)(A)	Beginning 12 months after a permit to construct for an APCD is issued to meet the requirements of paragraph (d)(1)(B) unless an extension is granted or Beginning 36 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year, whichever is earlier
	(d)(2)(A)(ii)	Beginning 12 months after the month in which the cumulative annual Nitric Acid additions exceed the threshold in the second Exceedance Year

Specifies process for units, complying with *Pathway C – Recordkeeping*, that exceeded threshold for two or more years

- Must transition to either:
 - Install an APCD (d)(1)
 - Source test (d)(2)(A)
- Deadline based on month threshold was exceeded of second Exceedance Year

Example provided on next slide

PATHWAY C – EXAMPLE OF THRESHOLD EXCEEDANCES

<i>Sample Facility B</i>	Unit 1	Unit 2
Jan 2025	No APCD	No APCD
Compliance Pathway	<i>Pathway C - Recordkeeping</i>	<i>Pathway C - Recordkeeping</i>
2026 Year	670 gal	500 gal
	1 st Exceedance Year – No violation	
2027 Year	540 gal (did not source test)	480 gal
2028 Year	More than 550 gal by October	510 gal
	2 nd Exceedance Year – Triggers (e) and loss of this pathway for all units	
Pathway Chosen	<i>Pathway A – APCD</i>	<i>Pathway B – Source Test</i>
Next Steps	APCD permit application due October 2029*	Source test report and permit application due October 2029*
	Source test report due October 2031	

* Facility B subject to annual limits beginning 2029 year until unit meets the requirements of this step at which point the unit is no longer subject to annual threshold limit

Annual Usage Thresholds for Facilities Subject to (e)(1)

(2) Annual Usage Threshold

In lieu of meeting the requirements of subparagraph (d)(2)(B), beginning the calendar year following the second Exceedance Year and until meeting the requirements of subparagraph (d)(1)(B) or (d)(2)(A), an owner or operator subject to the requirements of paragraph (e)(1) shall demonstrate that the adjusted additions to the Nitric Acid Unit(s) formerly complying with the requirements of subparagraph (d)(2)(B), as determined pursuant to paragraph (g)(3) and *Appendix A – Nitric Acid Additions and Adjustments*, do not exceed the thresholds specified in clauses (d)(2)(B)(i) and (d)(2)(B)(ii) for each calendar year.

- Facility subject to thresholds based on an individual calendar year
 - 550 gallons per unit
 - 1,650 gallons facility-wide
 - Recordkeeping required to demonstrate compliance
- Facility would not be subject to thresholds based on two calendar years out of five calendar years specified for Pathway C

Inspection and Maintenance of APCD (f)

- (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.

- Ensures APCD is operating properly
- APCD required to be in good operating condition
- Leaks can negatively impact capture efficiency and lead to increase NOx emissions

Monitoring – (g)(1)

(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 pressure differential measuring device(s).

- Weekly parameter monitoring and recordkeeping of APCD to ensure equipment is operating properly
- Applies if APCD is equipped with monitoring equipment

Recordkeeping – (g)(2) Units complying with (d)(2)(A)

(2) Recordkeeping Requirements for Facilities Complying with Subparagraph (d)(2)(A)

An owner or operator of a Nitric Acid Unit electing to meet the requirements of subparagraph (d)(2)(A) shall maintain a specification sheet for each:

- (A) Product or part processed in the Nitric Acid Unit(s) that specifies either, the precise percentage or the maximum percentage, of metal(s) present; and
- (B) Process type conducted in the Nitric Acid Unit that specifies the type of metals processed, and the acceptable operating conditions for nitric acid concentration and processing time

For units complying with *Pathway B – Source Test*

- Maintain records to demonstrate unit is not operated beyond source tested maximum conditions

Recordkeeping – (g)(3) Units complying with (d)(2)(B) or (e)(2)

An owner or operator of a Nitric Acid Unit electing to meet the requirements of subparagraph (d)(2)(B) or complying with requirements of paragraph (e)(2) 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*;

For units complying with *Pathway C – Recordkeeping and (e)*

- Demonstrate compliance with nitric acid addition limits by recording each:
 - Additions of Nitric Acid
 - Removal adjustments (optional)
- Solution analysis can be performed in-house or by third-party laboratory
- Recorded in equivalent of 68 WT%
 - *Appendix A* provides instructions

Recordkeeping – (g)(3) Units complying with (d)(2)(B) or (e)(2)

- (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 14 days after each calendar month; and
- (E) Annual Records of Additions to Nitric Acid Units
No later than February 1, 2026 and no later than February 1 of each subsequent year, determine 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*.

(continued)

Recordkeeping of supporting documents

- Safety Data Sheets
- Analysis reports

Monthly and annual summary of additions to units

- *Appendix B provides forms to be used*
- Allows facility to track their nitric acid additions and change compliance pathway for units before triggering (e)

Recordkeeping – (g)(4)

(4) Record Retention Requirements

The owner or operator shall maintain, keep on site for at least five years, and make available to the Executive Officer upon request all records.

- Five-year record retention kept onsite
 - *Pathway C – Recordkeeping* looks at five years of additions

Source Testing Requirements and Test Methods (h)(1) – Protocol Submission

- (1) Submittal of Source Test Protocol Prior to Source Testing
 - (A) Prior to conducting the first 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.
 - (B) Prior to conducting any subsequent source test to meet the requirements specified in paragraph (h)(5), the owner or operator of a Nitric Acid Unit shall submit a source test protocol that includes the conditions, numbers, and parameters referenced by subparagraphs (h)(2)(A) through (H) if there are any changes in the conditions, numbers, or parameters referenced by subparagraphs (h)(2)(A) through (H) in the most recently-approved source test protocol or if the Executive Officer requests an updated or new source test protocol.

- Source test protocol to be submitted and approved prior to initial source test
- Specifies conditions for periodic source tests where new protocol is required
 - Change in configuration
 - Executive Officer determines previous protocol does not reflect current methods or technology

Source Testing Requirements and Test Methods (h)(2) – Protocol for APCD

- (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 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.

- Required for APCDs venting unit(s) complying with *Pathway A - APCD* demonstrating compliance with either
 - 0.30 lb/hr; or
 - 99% control efficiency
- Specifies required elements to be included in source test protocol

Source Testing Requirements and Test Methods (h)(3) – Protocol for uncontrolled emissions

- (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 that includes:
- (A) Information specified in subparagraphs (h)(2)(A) through (F) and South Coast AQMD permit for the Nitric Acid Unit(s);
 - (B) Metals or metal alloys to be tested;
 - (C) A product sheet that specifies either the precise percentage or the maximum percentage of metal(s) in a metal alloy listed pursuant to subparagraph (g)(3)(B); and
 - (D) Test conditions, representing either maximum operations of the Nitric Acid Unit(s) or conditions approved by the Executive Officer, that include the following parameters:
 - (i) Temperature;
 - (ii) Nitric acid concentration; and
 - (iii) Number of parts processed.

- Required for all units complying with *Pathway B – Source Test* at facility to demonstrate the combined uncontrolled emissions is ≤ 0.60 lb/hr
- Specifies required elements to be included in source test protocol when testing uncontrolled emissions

Source Testing Requirements and Test Methods (h) – Source Test

(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 source test protocol most recently required pursuant to paragraph (h)(1), after it has been approved;
- (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 South Coast AQMD 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 South Coast AQMD Rule 1469 (2013)* or other South Coast AQMD approved method.

- Specifies how a required source test is to be conducted based on configuration of unit(s) and/or APCD

Source Testing Requirements and Test Methods (h) – Frequency and Reporting

(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 120 days after date source test was conducted and no later than the applicable due date in Table 1 or paragraph (h)(5), 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.

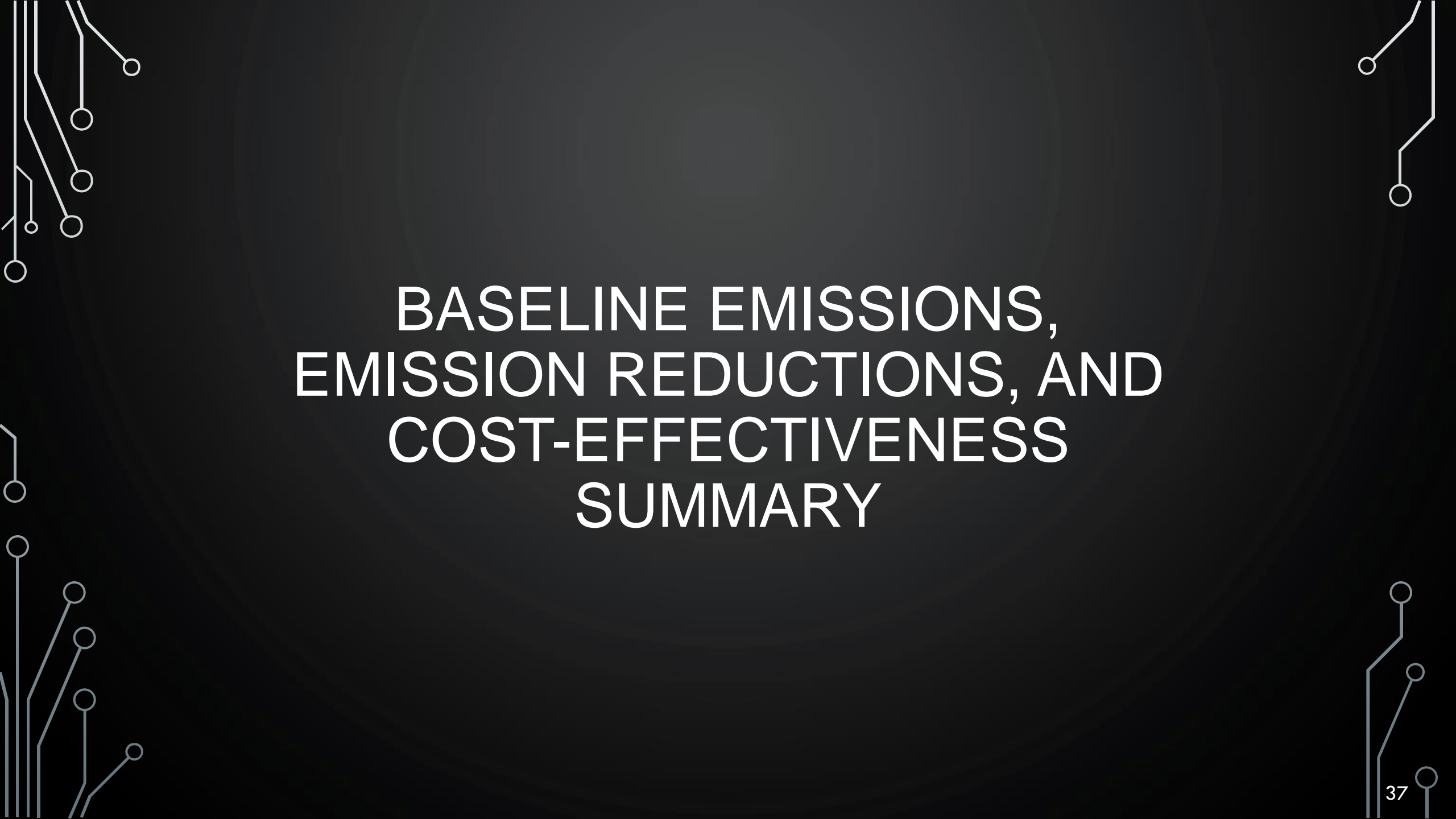
- Periodic source testing every five years for APCDs venting unit(s) complying with *Pathway A – APCD*
 - Source tests for *Pathway B – Source Test* are tested at maximum operations
 - Source tests for *Pathway A – APCD* are tested at typical operations
- Source test reports due 120 days of source test date and by the effective compliance date

Exemptions (i) – Cleaning Tanks

The requirements of paragraphs (d)(1) through (d)(3), subdivision (g), and subdivision (h) do not apply to a Cleaning Tank described exclusively as a cleaning tank in the description of a South Coast AQMD permit.

Permit listing a nitric acid unit as a cleaning tank is exempt from most rule requirements

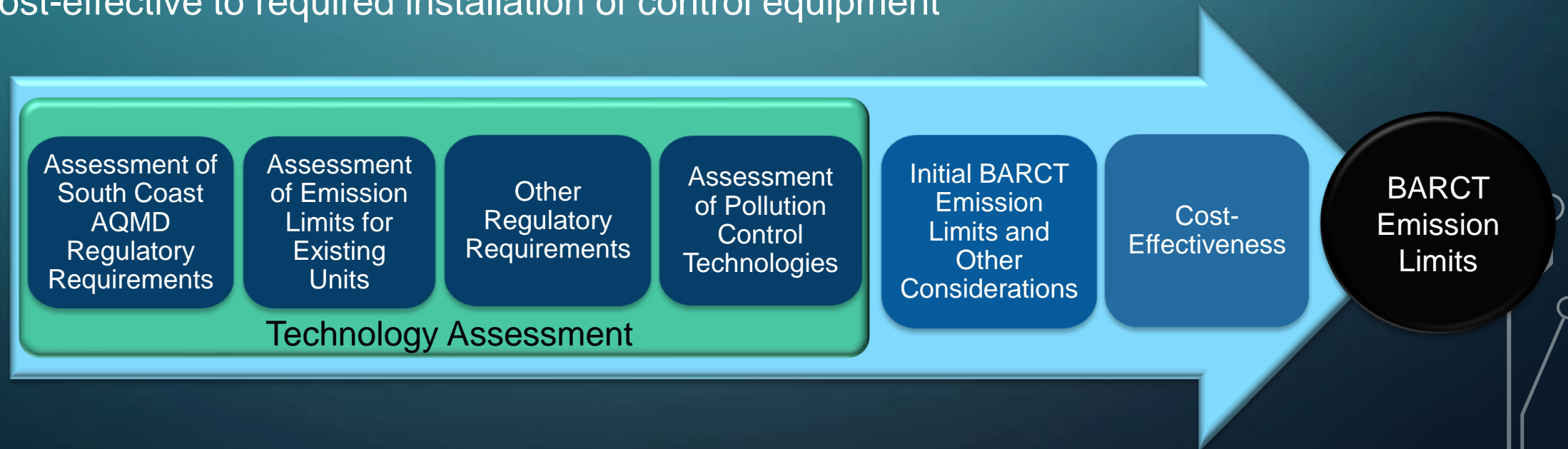
- Not required to comply with compliance pathway and associated requirements

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BASELINE EMISSIONS, EMISSION REDUCTIONS, AND COST-EFFECTIVENESS SUMMARY

BARCT Analysis – Background

- BARCT analysis required when establishing emission limits for equipment that emit certain pollutant such as NOx, volatile organic compounds (VOC), and particulate matter
- California Health and Safety Code Section 40406 defines BARCT as:
 - “...an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source.”
- Cost-effectiveness analysis reassessed in 2024 to establish thresholds where it is not cost-effective to required installation of control equipment



BARCT Emission Limits

- Existing Best Available Control Technology require scrubbers to control NOx emission for certain nitric acid units
- Multi-stage scrubbers shown to achieve emission rates 0.3 lb/hr or lower for control of NOx
- BARCT emission limit of 0.30 lb/hr is technologically feasible for PR 1159.1
 - A control efficiency of 99% is included as a compliance option per stakeholder request

NOx Control Performance Levels Achieved by Facilities

Scrubber Source Test Results

- 0.29 lb/hr for NOx
- 0.23 lb/hr for NOx
- 0.26 lb/hr for NOx
- 0.26 lb/hr for NOx

PR 1159.1 Baseline Emissions and Emission Reductions of NOx

Baseline NOx Emissions

- Calculated from facility survey response and conversion to NOx emissions
 - 4.79 lbs of NOx emission from 1 gallon of nitric acid 68% by weight
 - Conservative approach, assumes 100% nitric acid reacts to form NOx
- Total NOx emissions for impacted facilities: 1.16 tons/day

Emissions Reductions

- Forecasted based on facility survey response and expected compliance pathway with PR 1159.1
- 248 facilities would not be required to install controls (No NOx reductions)
 - Comply with *Pathway B – Source Test* or *Pathway C – Recordkeeping*
 - Operations are below cost-effectiveness threshold to install controls
- 7 facilities would be required to install controls
 - Comply with *Pathway A – APCD*
 - Operations are above the cost-effectiveness threshold to install controls
 - 0.15 tons/day of NOx emission reductions

Cost-Effectiveness Analysis

- A cost-effectiveness analysis was conducted to determine when it would be cost effective to require controls based on emission reductions and cost for controls
- An evaluation was conducted to determine the amount of uncontrolled NOx emissions that would result in enough emission reduction to be cost effective
 - At least 0.60 lb/hr of uncontrolled NOx emissions would be required to get sufficient reductions for the installation of controls to be cost effective
 - 0.60 lb/hr (uncontrolled emission rate) → 0.30 lb/hr (emission rate with APCD)

Cost-Effectiveness Summary Table	
Estimated Capital Costs	\$1.7 million
Annual Costs	\$230,000
Equipment Operation Assumption	4360 hrs
Cost-Effectiveness Threshold (2023)	\$362,600/ton

Incremental Cost-Effectiveness Assessment

- California Health and Safety Code § Section 40920.6(a)(3) states that an incremental cost-effectiveness assessment should be performed on identified potential control options that meet air quality objectives
- As scrubber control technology was identified as the only option to control NOx emissions from Nitric Acid Units, no incremental cost-effectiveness assessment was performed for PR 1159.1

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CEQA & SOCIOECONOMIC IMPACTS OF PR 1159.1

California Environmental Quality Act (CEQA)

- Staff is reviewing PR 1159.1 to determine if it will result in any potential adverse environmental impacts
- Appropriate CEQA documentation will be prepared based on the analysis

Socioeconomic Impact Assessment

- Health and Safety Code Section 40440.8 and 40728.5
 - Requires socioeconomic impact assessment for proposed rule or rule amendment which “will significantly affect air quality or emissions limitations”
 - Socioeconomic impact assessment shall consider (to the extent data is available):
 1. Type of affected industries, including small businesses
 2. Impact on regional employment and economy
 3. Range of probable costs, including costs to industry or business
 4. Availability and cost-effectiveness of alternatives
 5. Emissions reduction potential
 6. Necessity of adopting, amending, or repealing the rule

NEXT STEPS

Next Steps



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