SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Socioeconomic Impact Assessment For Proposed Rule 1159.1 – Control of NOx Emissions from Nitric Acid Tanks

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EXECUTIVE SUMMARY

On March 17, 1989, the South Coast Air Quality Management District (South Coast AQMD) Governing Board adopted a resolution which requires an analysis of the economic impacts associated with adopting and amending rules and regulations. In addition, Health and Safety Code Section 40440.8 requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations." Health and Safety Code Section 40728.5 requires the South Coast AQMD Governing Board to actively consider the socioeconomic impacts of regulations, make a good faith effort to minimize adverse socioeconomic impacts and include small business impacts. Lastly, Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or "all feasible measures" requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOC), and their precursors.

Proposed Rule (PR) 1159.1 – Control of NOx Emissions from Nitric Acid Tanks, aims to reduce NOx emissions by requiring the affected facilities to install control devices or demonstrate low emissions by either source testing or documentation of low nitric acid usage. PR 1159.1 also establishes provisions for parameter monitoring, recordkeeping, maintenance, and inspection at the affected facilities to ensure that the air pollution control devices (APCD) are working as intended.

A socioeconomic impact assessment has been conducted to assess the socioeconomic impacts from implementing PR 1159.1 and the following presents a summary of the analysis and findings.

Key Elements of PR 1159.1

PR 1159.1 aims to reduce NOx emissions from Nitric Acid Units by requiring facilities with high emissions to install and vent emissions to an APCD meeting the BARCT emission limit, or demonstrate emissions are less than certain thresholds through conducting source tests, or provide documentation which confirms low nitric acid usage. Implementation of PR 1159.1 is estimated to result in a reduction of NOx emissions by 0.11 ton per day (tpd).

Affected Facilities and Industries

PR 1159.1 will affect 255 facilities located throughout Los Angeles, Orange, Riverside, and San Bernardino Counties. Of the affected facilities, seven facilities are projected to each install an APCD, 14 facilities will need to conduct source tests for uncontrolled emissions, and 234 facilities will need to keep records documenting their nitric acid usage. The 255 affected facilities span 18 different sectors based on the North American Industry Classification System (NAICS), with the majority (148 facilities) from the Fabricated Metal Product Manufacturing (NAICS 332) sector.

A small business analysis was conducted for the facilities affected by PR 1159.1 and the following table presents the number of affected facilities that will qualify as small businesses under various small-business definitions used in the analysis.

Small-business Definition	Number of Facilities
South Coast AQMD Rule 102	1
South Coast AQMD's Small Business Assistance Office	172
U.S. Small Business Administration	224
1990 CAAA	69

Assumptions for the Analysis

The key requirements of PR 1159.1 that would have cost impacts include: 1) purchase and operation of APCDs, which are assumed to be multi-stage NOx scrubbers; 2) permitting fees; 3) conducting source tests; 4) conducting parametric monitoring; 5) conducting maintenance and inspections; 6) recordkeeping; and 7) analyzing tank solutions.

Specifically, PR 1159.1 would require facilities with high emissions to purchase and operate scrubbers to decrease the NOx emissions from Nitric Acid Tanks. Alternatively, source testing of Nitric Acid Units or nitric acid recordkeeping are required to demonstrate emissions or nitric acid usage are less than certain thresholds specified in PR 1159.1. In addition, maintenance, inspections and recordkeeping of APCDs, will be required to ensure proper operation of APCDs.

PR 1159.1 provides three pathways that a facility may select to comply with the rule: 1) Pathway A consists of installing and operating an APCD that meets a 0.30 lb/hr or 99% control efficiency which can be demonstrated through conducting periodic source testing every five years; 2) Pathway B requires source testing of Nitric Acid Units to demonstrate a NOx emission rate of 0.60 lb/hr or less; and 3) Pathway C allows for the demonstration of low nitric acid usage through recordkeeping. The analysis indicates that the most expensive option is Pathway A and the least expensive option is Pathway C. This analysis assumes that a facility would prioritize the least costly pathway to comply with PR 1159.1 requirements. The number of facilities choosing each pathway was extrapolated using data from self-conducted surveys sent out by staff to facilities.

Compliance Costs

The analysis estimates the costs of implementing PR 1159.1 over the period 2025-2052. The total present value of the compliance costs for PR 1159.1 is estimated to be $59.2 million and $38.5 million for a 1% and 4% discount rate, respectively. The average annual compliance cost of PR 1159.1 is estimated to range from $2.3 million to $2.5 million for a 1% to

4% real interest rate, respectively. When using a 4% real interest rate, this analysis indicates that maintenance comprises the majority of the average annual costs (55.6%), followed by the purchase of scrubbers (28.2%).

The following table presents a summary of the average annual costs of PR 1159.1 implementation by cost categories.

Average Annual Compliance Costs (2025-2052)

Cost Categories	1% Real Interest Rate	4% Real Interest Rate
Capital Costs		
Multi-stage NOx Scrubbers (APCD) (Pathway A)	$501,160	$686,128
APCD Permitting Fees (Pathway A)	$2,693	$3,817
Permitting Fees to Incorporate Conditions (Pathway B)	$9,687	$13,728
Source Testing APCDs (Pathway A)	$2,649	$3,627
Source Testing Tanks (Pathway B)	$10,456	$14,735
Recurring Costs		
Parameter Monitoring	$18,200	$18,200
APCD Operation and Maintenance Cost (Pathway A)	$1,380,000	$1,380,000
Periodic Source Testing APCDs (Pathway A)	$7,929	$7,929
Inspections (Pathway A)	$1,400	$1,400
Permit Renewal Fees (Pathway A)	$12,938	$12,938
Specification Sheet Keeping (Pathway B)	$7,521	$7,521
Nitric Acid Recordkeeping (Pathway C)	$140,400	$140,400
Tank Solution Analysis (Pathway C)	$180,514	$180,514
Total	**$2,275,547**	**$2,470,937**

Job Impacts

The direct effects of implementing PR 1159.1 are used as inputs to the Regional Economic Models, Inc (REMI PI+) model to assess job impacts and secondary/inducted impacts for all industries in the four-county economy on an annual basis from 2025-2052.

When the compliance costs are annualized using a 4% real interest rate, the REMI analysis forecasts 34 net jobs foregone annually in the four-county region on average over the forecast period, relative to the baseline

forecast. The largest job impact occurs in the year 2033 when the REMI model forecasts 45 net jobs foregone relative to the baseline scenario.

Competitiveness

The overall impact of implementing PR 1159.1 on production costs and delivered prices in the South Coast AQMD region is expected to be minimal. According to the REMI Model, PR 1159.1 implementation is projected to result in a slight increase in the relative cost of production and delivered price in the Fabricated Metal Product Manufacturing sector (NAICS 332) by 0.0059% and 0.0051% annually on average, over the period from 2025 to 2052, respectively.

INTRODUCTION

The Regional Clean Air Incentives Market (RECLAIM) program is a market-based emissions trading program under South Coast AQMD Regulation XX, which was designed to reduce NOx and SOx emissions in South Coast AQMD region and applies to facilities with historical NOx and SOx emissions greater than four tons per year. To achieve more NOx emission reductions at RECLAIM facilities, the 2016 Air Quality Management Plan (AQMP) directed a transition from the RECLAIM program to a command-and-control regulatory structure requiring BARCT as soon as practicable. California Assembly Bill 617 also required air districts to develop an expedited schedule for the implementation of BARCT by December 31, 2023, for industrial facilities within the California greenhouse gas cap-and-trade program. As facilities transition out of the NOx RECLAIM program, a command-and-control rule that includes NOx emission standards reflecting BARCT will be needed for all equipment categories. While most NOx emissions are from combustion sources, Proposed Rule 1159.1 (PR 1159.1) would address NOx emissions from chemical reaction or decomposition of nitric acid (i.e., non-combustion sources).

Specifically, PR 1159.1 – Control of NOx Emissions from Nitric Acid Tanks (hereafter referred to as Nitric Acid Units), is a command-and-control rule for the facilities that operate one or more Nitric Acid Units where nitric acid either decomposes at temperatures greater than 1,300 degrees Fahrenheit or reacts with a metal to form NOx. As a result of the BARCT assessment, PR 1159.1 proposes a NOx emission limit of 0.30 pound per hour (lb/hr) or a control efficiency of 99% for the Nitric Acid Units. PR 1159.1 requires facilities with emissions greater than the NOx emission limit to install air pollution control devices (APCDs) (Pathway A). Alternatively, facilities with either emissions less than the NOx emission limit or with low usage of nitric acid may elect to comply with PR 1159.1 through source testing (Pathway B) or by providing documentation of low usage of nitric acid (Pathway C). In addition, PR 1159.1 establishes implementation schedules as well as requirements for parameter monitoring, recordkeeping and source testing.

PR 1159.1 would apply to the RECLAIM facilities, former RECLAIM facilities that have already exited the RECLAIM program, and other non-RECLAIM facilities. A total of 255 facilities, distributed as 11 RECLAIM facilities and 244 non-RECLAIM facilities, have 928 Nitric Acid Units that will be subject to this proposed rule. Of the affected facilities, seven facilities are projected to install APCDs, 14 facilities will need to conduct source tests for uncontrolled emissions, and 234 facilities will need to document their nitric acid usage through recordkeeping. Overall, implementation of PR 1159.1 is estimated to result in a reduction of NOx emissions by 0.11 ton per day (tpd).

LEGISLATIVE MANDATES

The legal mandates directly related to the assessment of PR 1159.1 include South Coast AQMD Governing Board resolutions and various sections of the Health and Safety Code.

South Coast AQMD Governing Board Resolution

On March 17, 1989, the South Coast AQMD Governing Board adopted a resolution that calls for an economic analysis associated with adopting and amending rules and regulations that considers all of the following elements:

- Affected industries

- Range of probable costs
- Cost-effectiveness of control alternatives
- Public health benefits

Health and Safety Code Requirements

The state legislature adopted legislation which reinforces and expands the South Coast AQMD Governing Board resolution requiring socioeconomic impact assessments for rule development projects. Health and Safety Code Section 40440.8, which went into effect on January 1, 1991, requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations."

To satisfy the requirements in Health and Safety Code Section 40440.8, the scope of the socioeconomic impact assessment should include all of the following information:

- Type of affected industries;
- Impact on employment and the regional economy;
- Range of probable costs, including those to industry;
- Availability and cost-effectiveness of alternatives to the rule;
- Emission reduction potential; and
- Necessity of adopting, amending, or repealing the rule in order to attain state and federal ambient air quality standards.

Health and Safety Code Section 40728.5, which went into effect on January 1, 1992, requires the South Coast AQMD Governing Board to: 1) actively consider the socioeconomic impacts of regulations; 2) make a good faith effort to minimize adverse socioeconomic impacts; and 3) include small business impacts. To satisfy the requirements in Health and Safety Code Section 40728.5, the socioeconomic impact assessment should include the following information:

- Type of industries or business affected, including small businesses; and
- Range of probable costs, including costs to industry or business, including small business.

Finally, Health and Safety Code Section 40920.6, which went into effect on January 1, 1996, requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or "all feasible measures" requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compound (VOC), and their precursors. The BARCT and cost-effectiveness analyses for PR 1159.1 were conducted and are located in Chapter 2 of the Draft Staff Report.[1]

AFFECTED FACILITIES

PR 1159.1 would apply to RECLAIM facilities, former RECLAIM facilities that have already exited the RECLAIM program, and other non-RECLAIM facilities which utilize Nitric Acid Units

[1] South Coast AQMD, Second Preliminary Draft Staff Report for Proposed Rule 1159.1 - Control of NOx Emissions from Nitric Acid Tanks, https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1159.1/pr1159-1_second_pdsr_092024.pdf

for metal finishing, precious metal reclamation, and expanded graphite foil production in the South Coast AQMD region. A total of 255 facilities, distributed as 11 RECLAIM facilities and 244 non-RECLAIM facilities, have 928 Nitric Acid Units that will be applicable to this proposed rule. Table 1 provides the number of affected facilities by type of operation that use Nitric Acid Units. Most of the facilities use nitric acid for metal finishing.

Table 1
Distribution of PR 1159.1 Affected Facilities Across Types of Operation

Type of Operation	RECLAIM Facilities	Non-RECLAIM Facilities
Metal Finishing	9	243
Precious Metal Reclamation	1	1
Expanded Graphite Foil Production	1	0
Total	**11**	**244**

Table 2 presents the distribution of the affected facilities across various industrial sectors under the North American Industrial Classification System (NAICS). As summarized in the table, the majority of the affected facilities are in the Fabricated Metal Product Manufacturing sector (58.0%), followed by the Computer and Electronic Product Manufacturing sector (10.2%) and Other Transportation Equipment Manufacturing sector (8.2%).

Table 2
Distribution of PR 1159.1 Affected Facilities across NAICS Sectors

Industry Sector	NAICS Code	Number of Facilities	Percentage
Fabricated Metal Product Manufacturing	332	148	58.0%
Computer and Electronic Product Manufacturing	334	26	10.2%
Other Transportation Equipment Manufacturing	3364-3369	21	8.2%
Professional, Scientific, and Technical Services	54	13	5.1%
Primary Metal Manufacturing	331	9	3.5%
Repair and Maintenance	811	6	2.4%
Machinery Manufacturing	333	5	2.0%
Miscellaneous Manufacturing	339	4	1.6%
Wholesale Trade	42	4	1.6%
Administrative and Support Services	561	4	1.6%

Industry Sector	NAICS Code	Number of Facilities	Percentage
Chemical Manufacturing	325	3	1.2%
Electrical Equipment, Appliance, and Component Manufacturing	335	3	1.2%
Food Manufacturing	311	2	0.8%
Printing and Related Support Activities	323	2	0.8%
Retail Trade	44-45	2	0.8%
Petroleum and Coal Products Manufacturing	324	1	0.4%
Nonmetallic Mineral Product Manufacturing	327	1	0.4%
State and Local Government	92	1	0.4%
Total		**255**	**100%**

Small Business Analysis

South Coast AQMD defines a "small business" in Rule 102 for purposes of fees as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. South Coast AQMD also defines “small business” for the purpose of qualifying for access to services from the South Coast AQMD’s Small Business Assistance Office (SBAO) as a business with annual receipts of $5 million or less, or with 100 or fewer employees. In addition to the South Coast AQMD's definitions of a small business, the federal Small Business Administration (SBA) and the federal 1990 Clean Air Act Amendments (1990 CAAA) also provide definitions of a small business.

The SBA definition of a small business varies by six-digit NAICS codes.[2] For example a business that has less than 750 employees in the Iron and Steel Forging (NAICS 332111) industry is considered a small business. The 1990 CAAA classifies a business as a "small business stationary source" if it: 1) employs 100 or fewer employees; 2) does not emit more than 10 tons per year of either VOC or NOx; and 3) is a small business as defined by SBA.

South Coast AQMD mostly relies on Dun and Bradstreet data to conduct small business analyses for private companies. In cases where the Dun and Bradstreet data are unavailable or unreliable, other external data sources such as Manta, Hoover, LinkedIn, and company website data will be used. The determination of data reliability is based on data quality confidence codes in the Dun and Bradstreet data as well as staff’s discretion. Revenue and employee data for publicly owned companies are gathered from Securities and Exchange Commission (SEC) filings. Since subsidiaries under the same parent company are interest-dependent, the revenue and employee data of a facility’s parent company will be used for the determination of its small business status.

[2] U.S. Small Business Administration, 2023 Small Business Size Standards, https://www.sba.gov/document/support-table-size-standards, accessed October 17, 2024.

Employment and revenue estimates from 2024 Dun and Bradstreet data as well as other external sources are available for 252 of the 255 facilities. Note that although the employment and revenue data for some facilities are unknown or missing, the current data used for this small business analysis represents the most thorough and accurate information obtainable as of the publication date of this draft report. The number of affected facilities that are small businesses based on each of the three definitions is presented in Table 3. Note that only 116 out of the 252 facilities have reported their annual VOC or NOx emissions to South Coast AQMD, of which 69 facilities qualify as small businesses, based on the 1990 CAAA definition.

Table 3
Count of Small Businesses Based on Various Definitions

Definition	Number of Facilities
South Coast AQMD Rule 102	1
South Coast AQMD's Small Business Assistance Office	172
U.S. Small Business Administration	224
1990 CAAA	69

COMPLIANCE COSTS

This section estimates compliance costs of PR 1159.1. Upon implementation of PR 1159.1, the incremental compliance costs to the affected facilities consist of one-time capital-related expenditures and recurring operation and maintenance (O&M) costs. Affected facilities will be required to make one-time investments, which include costs for purchasing and installing APCDs, as well as fees for permit applications and source testing. In addition, they would also incur recurring O&M costs for APCD maintenance, parameter monitoring, source testing, inspection, permit renewal, recordkeeping, and tank solution analysis. All the costs discussed in this section are expressed in 2023 dollars.

Under PR 1159.1, the affected facilities will be required to select one or more of the following pathways: 1) Pathway A consists of installing and operating an APCD that meets a 0.30 lb/hr or 99% control efficiency which can be demonstrated through periodic source testing every five years; 2) Pathway B requires source testing of Nitric Acid Units to demonstrate a NOx emission rate of 0.60 lb/hr or less; and 3) Pathway C allows for the demonstration of low nitric acid usage through recordkeeping. Pathway A is the costliest of the pathways due to the high cost of a scrubber combined with the expense of conducting periodic source tests. The costs associated with Pathway B would be from conducting a one-time source test to demonstrate NOx emission levels and from the permit revision fee to incorporate operational parameters into the permit to limit NOx emissions. Pathway C is the least costly option because it would only require recordkeeping of nitric acid usage and laboratory analyses for the optional removal adjustments. Of the three pathways, this analysis assumes that facilities would prioritize implementing the least costly pathway to comply with the requirements in PR 1159.1.

In 2023, staff conducted a survey of the facilities which have been participating in the rule development process (about 30% of the affected facilities) and the survey data have been relied

upon to extrapolate which of the compliance pathways would be selected by the 255 facilities subject to PR 1159.1. The results of this extrapolation indicate that seven facilities would select Pathway A, 14 facilities would select Pathway B, and 234 facilities would select Pathway C. The cost assumptions for each cost category for each pathway are discussed in the following sections.

Capital/One-Time Costs

APCD – Pathway A

NOx scrubbers were identified in the BARCT assessment as the appropriate type of APCD capable of controlling NOx emissions from Nitric Acid Units subject to PR 1159.1. Under Pathway A, an application seeking a Permit to Construct the NOx scrubber would need to be submitted by January 1, 2026. In addition, after a NOx scrubber is installed and operational, a source test would need to be conducted by January 1, 2029, to demonstrate that it is capable of achieving a NOx emissions rate of 0.30 lb/hr or 99% control efficiency. After the initial source test is conducted, periodic source testing will be required every five calendar years. For Nitric Acid Units equipped with an existing APCD, if a facility elects Pathway A, the performance standard can be demonstrated through source testing or by modifying the APCDs so that it can demonstrate compliance with the performance standard. Under Pathway A, the facility may elect to replace the existing APCD with control equipment capable of demonstrating compliance with the performance standard.

Based on vendors' quotes, the net equipment cost of a multistage NOx scrubber is $920,000, excluding tax and shipping, which is assumed to be 18% of the purchase price. Due to the facility-specific nature of site preparation and equipment installation costs, the analysis assumed that these expenses are a fixed proportion of the overall equipment price. Specifically, based on quotes included in an application for a Permit to Construct that was submitted in 2020, direct installation activities (e.g., foundation, handling, electrical, piping and painting) and indirect installation activities (e.g., engineering, construction, contractor, start-up, performance test and contingencies) are estimated to cost 27% and 31% of the gross cost of the equipment (including tax and shipping cost), respectively. The total capital cost of buying and installing a new APCD is estimated to be $1,715,248, and the unit is assumed to have a useful life of 25 years.

Permitting – Pathways A&B

Under Pathway A, an application for a Permit to Construct will be required for each new APCD, and an application seeking a permit revision will be required for each proposed modification to an existing APCD. Under Pathway B, an application for a permit revision will be required in order to incorporate operational parameters from source test results into existing permits. The applications seeking permits must be submitted no later than January 1, 2026 for Pathway A and July 1, 2025 for Pathway B. The one-time cost of an initial application fee for each APCD under Pathway A is assumed to be $9,450, based on fee Schedule D as specified in Rule 301 Table Fee Rate-A for three Title V and four non-Title V facilities.[3] The application fee for modifying an existing permit to incorporate operational parameters under Pathway B is $6,100, based on the fee Schedule C as specified in Rule 301 Table Fee Rate-A. Under Pathway A, seven applications seeking a permit are anticipated. Similarly, under Pathway B, 39 applications seeking permits are expected. The total cost of application fees for permitting activities under Pathways A and B combined is

[3] South Coast AQMD, Rule 301 – Permitting and Associated Fees, https://www.aqmd.gov/docs/default-source/rule-book/reg-iii/rule-301.pdf. Note that the fees are subject to change as Rule 301 is amended in future.

estimated to be $304,050.

Source Testing – Pathways A and B

PR 1159.1 would require source tests to be conducted in order to demonstrate: 1) that each APCD connected to one or more Nitric Acid Units is capable of achieving the NOx performance standard under Pathway A; and 2) that the NOx emissions from any Nitric Acid Unit that is not connected to an existing APCD are no greater than 0.60 lb/hr under Pathway B. Under Pathway A, facilities will need to demonstrate compliance with the NOx performance standard within 12 months of the issuance of the Permit to Construct (or the date specified on an approved extension, if applicable) but no later than January 1, 2029 and periodically every five years thereafter. Similarly, under Pathway B, facilities will need to demonstrate compliance with the NOx performance standard no later than January 1, 2026 by conducting a one-time source test.

The one-time source test under Pathway B would need to be conducted under maximum operating conditions. Feedback from source testing providers indicated that a source test would typically cost $5,000. However, to account for the cost of constructing a temporary collection hood to collect/measure the NOx emissions, this analysis assumes an additional $500 per source test conducted under Pathway B. Based on an average of three Nitric Acid Units per facility as identified in the survey, each facility following Pathway B would require three source tests on average costing $5,500 each, with a total of $16,500.

In addition, under Pathway B, a source test protocol for each source test is required to be submitted to the South Coast AQMD and approved prior to conducting the source test. A source test report is also required to be submitted for evaluation by the South Coast AQMD after the test. Based on the fees specified in Rule 306 (m) – Protocol/Report/Catalyst Equivalency Evaluation Fees, the evaluation cost of a source test protocol and source test report will be $550 each.[4] Thus, for 14 facilities that are expected to conduct an average of three source tests under Pathway B, the total cost of source testing is estimated to be $19,800.

Recurring O&M Costs

Maintenance, Source Testing, Inspection and Permit Renewal – Pathway A

Annual maintenance of APCDs is necessary to ensure that they will continue to achieve the NOx emission standards specified in PR 1159.1. This analysis assumed an annual operational and maintenance cost of 25% of the net purchase price of the APCD, which is consistent with cost information provided by a large facility with a multistage NOx scrubber. The annual cost of operating and maintaining one APCD is estimated to be $230,000 per year (See Table 4-1 in the Draft Staff Report).

Under Pathway A, each APCD would be subject to periodic source testing which is required every five years. Note that the cost associated with the review of a source test protocol will only need to be paid once since subsequent source tests can rely on the initially approved source test protocols so long as there are no changes to the Nitric Acid Unit(s) and its APCD. However, the cost of evaluating each source test report will need to be paid each time a source test is conducted.

[4] South Coast AQMD, Rule 306 Plan Fees, https://www.aqmd.gov/docs/default-source/rule-book/reg-iii/rule-306.pdf

Under Pathway A, each APCD would need a quarterly visual inspection to ensure proper operation of the equipment beginning in 2026. For the purpose of this analysis, the inspection is assumed to occur one hour per quarter and it will be conducted by an in-house staff at a rate of $50 per hour, which will result in an annual cost of $200 for each facility.

In addition, under Pathway A, annual permit renewal fees will be required for each APCD at three Title V facilities and four non-Title V facilities. Based on fee Schedule D as specified in Rule 301 Table Fee Rate-A, the cost for each permit renewal is assumed to be $2,250. Under Pathway B, no additional permit renewal fees will be needed since each affected facility has an existing permit that were already subject to these permit renewal fees prior to PR 1159.1.

Recordkeeping – Pathways A, B, and C

Under Pathway A, PR 1159.1 requires recordkeeping of weekly parameter monitoring of APCDs beginning January 1, 2025. Records will need to include documentation of the flowrate, pH, and pressure drops. This analysis assumes that recordkeeping activities will take one hour per week, at a rate of $50 per hour. Under Pathway A, recordkeeping will cost $2,600 per year for each of the seven facilities.

Under Pathway B, PR 1159.1 requires recordkeeping of specification sheets to ensure that each facility's operation activities are within the maximum operation conditions as specified in the results from the one-time source test. Under Pathway B, this analysis assumes that one hour of recordkeeping each month at a rate of $50 per hour will be needed, which leads to an annual cost of $600 for each facility.

Under Pathway C, PR 1159.1 requires recordkeeping of the amounts of nitric acid used (additions and optional removal adjustments) beginning July 1, 2025. Facility resources for keeping records of nitric acid additions are expected to be minimal as facilities routinely maintain tank chemistry through existing periodic laboratory analysis and already maintain records associated with this analysis. For this report, the analysis assumes an extra one hour per month at a rate of $50 per hour, may be needed to conduct additional recordkeeping associated with nitric acid usage. Under Pathway C, recordkeeping of nitric acid usage at each facility will cost $600 per year.

Tank Solution Analysis – Pathway C

Under Pathway C, for any facility that pursues an optional removal adjustment, a chemical analysis of a sample taken from discarded tank solutions would need to be performed four times per year at a cost of $200 per sample. This cost includes fees for transport and analysis. Thus, the annual cost for analysis of discarded tank solution is estimated to be $800 per facility. Note that this cost analysis assumes that all facilities may perform optional disposal adjustment, but as a practical matter not all facilities will need to do so, especially those facilities that can demonstrate that the nitric acid additions are less than the per-tank and facility-wide thresholds. Additionally, for facilities with in-house laboratories and chemists, the cost of these sample analyses would be lower.

Tank Labels – Pathways A, B and C

PR 1159.1 requires tank labeling beginning July 1, 2025, unless tank labeling was otherwise required by Rule 1426 or Rule 1469. Although cleaning tanks would still need to be labeled under

PR 1159.1, it is assumed that many facilities already have existing labeling or there would be minimal new labels required, so no costs are assumed for tank labeling in the analysis.

Total Compliance Costs of PR 1159.1

Many of the costs estimated in this analysis are highly dependent on site-specific factors and on decisions made by facilities subject to PR 1159.1. It is also important to note that when conducting the cost analysis, every effort was made to represent costs as realistically as possible, given that many factors would ultimately dictate what price a facility will pay to implement a control. The estimated cost for each cost category was either represented by an industry average or a reasonable range, based on the information and data available. For these reasons, compliance costs are assumed to remain the same in the foreseeable future, with any increase being a result of inflation. The procedure and assumptions for each cost estimate are discussed in the following paragraph.

The total cost is calculated over 28 years, from 2025 to 2052. To estimate the annual compliance cost of PR 1159.1, the one-time capital cost over the useful life of the equipment was amortized and added to the recurring cost for each compliance year. Table 4 presents total and average annual compliance cost of PR 1159.1 by requirement categories. As presented in Table 4, the total present value of compliance cost of PR 1159.1 is estimated at $59.6 million and $38.9 million, respectively, depending on the discount rate assumed (1% to 4%).[5] Correspondingly, the average annual compliance costs of PR 1159.1 are estimated to range from $2.3 million to $2.5 million, respectively, depending on the real interest rate assumed (1% to 4%).

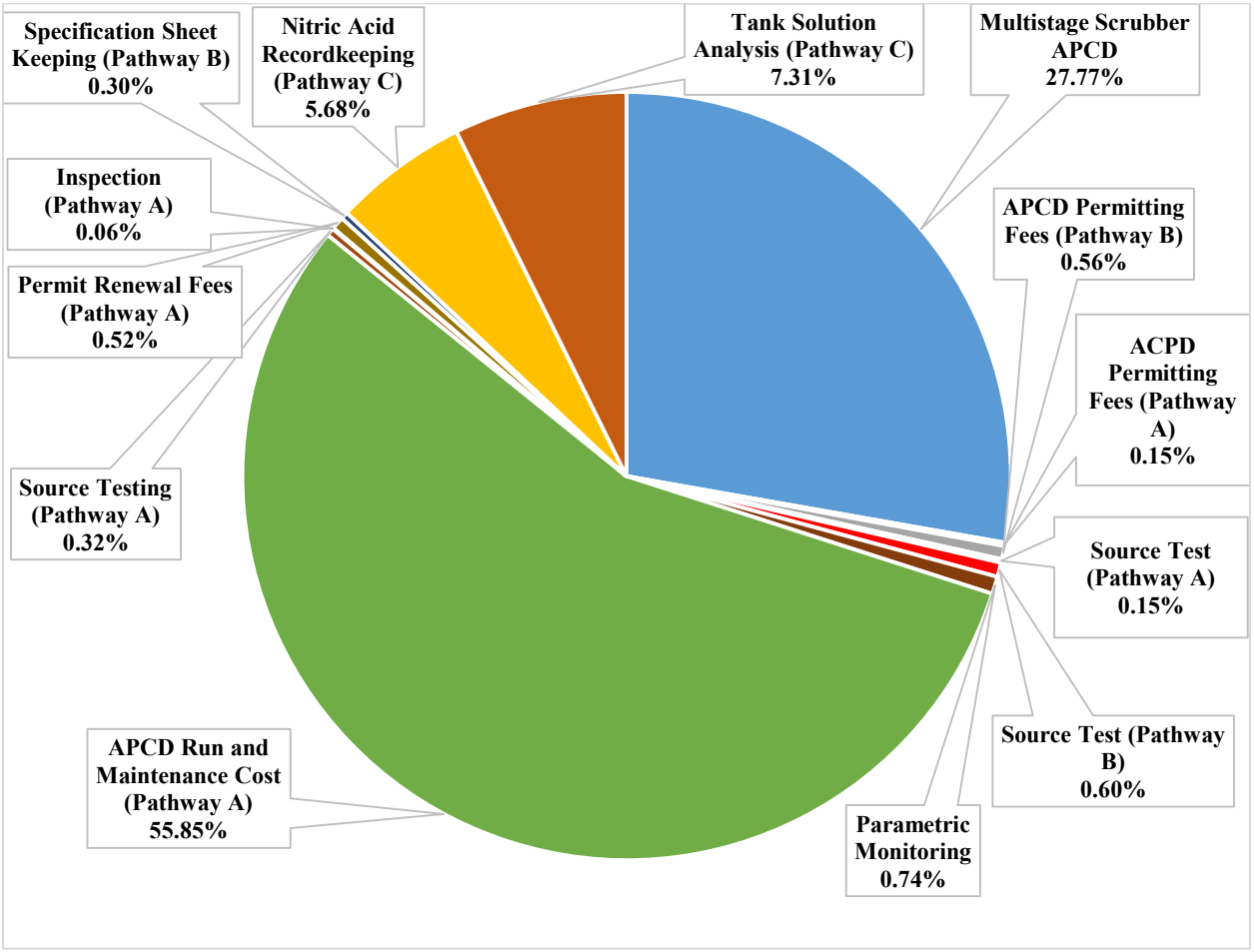
[5] In 1987, South Coast AQMD staff began to calculate cost-effectiveness of control measures and rules using the Discounted Cash Flow method with a discount rate of 4%. Although not formally documented, the discount rate is based on the 1987 real interest rate on 10-year Treasury Notes and Bonds, which was 3.8%. The maturity of 10 years was chosen because a typical control equipment life is 10 years; however, a longer equipment life would not have corresponded to a much higher rate -- the 1987 real interest rate on 30-year Treasury Notes and Bonds was 4.4%. Since 1987, the 4% discount rate has been used by South Coast AQMD staff for all cost-effectiveness calculations, including BACT analysis, for the purpose of consistency.

Table 4
Total Present Value and Average Annual Estimated Costs of PR 1159.1

Cost Categories	Present Value (2024)		Annual Average (2025 – 2052)	
	1% Discount Rate	4% Discount Rate	1% Real Interest Rate	4% Real Interest Rate
Capital Costs				
Multistage Scrubber APCD (Pathway A)	$16,514,049	$10,927,569	$501,160	$686,128
ACPD Permitting Fees (Pathway A)	$92,820	$63,606	$2,693	$3,817
APCD Permitting Fees (Pathway B)	$333,815	$228,750	$9,687	$13,728
Source Test (Pathway A)	$86,833	$56,417	$2,649	$3,627
Source Test (Pathway B)	$357,423	$242,921	$10,456	$14,735
Recurring Costs				
Parameter Monitoring	$442,559	$303,268	$18,200	$18,200
APCD Run and Maintenance Cost (Pathway A)	$32,867,309	$20,983,400	$1,380,000	$1,380,000
Source Testing (Pathway A)	$188,678	$119,038	$7,929	$7,929
Inspection (Pathway A)	$34,043	$23,328	$1,400	$1,400
Permit Renewal Fees (Pathway A)	$306,542	$192,327	$12,938	$12,938
Specification Sheet Keeping (Pathway B)	$181,945	$122,472	$7,521	$7,521
Nitric Acid Recordkeeping (Pathway C)	$3,414,029	$2,339,494	$140,400	$140,400
Tank Solution Analysis (Pathway C)	$4,366,692	$2,939,325	$180,514	$180,514
Total	**$59,186,738**	**$38,541,915**	**$2,275,547**	**$2,470,937**

Figure 1 presents the estimated annual compliance cost of PR 1159.1 by cost categories. The APCD O&M cost comprises the largest proportion of the estimated average annual compliance costs (56%), followed by multistage scrubber (28%) and tank solution analysis (7%).

Figure 1
Average Annual Estimated Costs of PR 1159.1 by Cost Category (%)



MACROECONOMIC IMPACTS ON THE REGIONAL ECONOMY

The Regional Economic Model (REMI, PI+ v3) was used to assess the anticipated socioeconomic impacts of PR 1159.1.[6, 7] The model, which is comprised of analytical modules with embedded datasets and econometric features, links the economic activities occurring in the counties of Los Angeles, Orange, Riverside, and San Bernardino, and for each county and considers five interrelated blocks: 1) output and demand; 2) labor and capital; 3) population and labor force; 4) wages, prices and costs; and 5) market shares.[8]

[6] Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (70-sector model). Version 3. 2023.

[7] REMI v3 has been updated based on The U.S. Economic Outlook for 2022-2024 from the University of Michigan's Research Seminar in Quantitative Economics (RSQE) release on May 19, 2023, The Long-Term Economic Projections from CBO (supplementing CBO's March 2023 report, The 2023 Long-Term Budget Outlook).

[8] Within each county, the industrial sectors are made up of 156 private non-farm industries and sectors, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration. For details, please refer to REMI online documentation at http://www.remi.com/products/pi.

It should be noted that the REMI model is not designed to assess impacts on individual operations. The model was used to assess the impacts of the proposed project on various industries that make up the local economy. Cost impacts on individual operations were assessed outside of the REMI model and used as inputs into the REMI model.

Impacts of PR 1159.1

The assessment herein is performed relative to a baseline ("business as usual") forecast where PR 1159.1 would not be implemented. This analysis assumes that the affected facility would finance the capital and installation costs of control equipment at a 4% real interest rate and that these one-time costs are amortized and incurred over the life of the equipment.

Direct effects of PR 1159.1 are used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the industries in the four-county economy on an annual basis and across the following user-defined horizon: 2025 (the first year when the affected facilities are assumed to incur compliance costs due to PR 1159.1 implementation) to 2052 (the final year in which new equipment is fully amortized).

Direct effects of PR 1159.1 include:

1) Additional costs that affected facilities would incur by installing and operating APCDs to minimize NOx emissions from Nitric Acid Units. Since the number of facilities under each pathway is estimated based on a self-conducted survey, the total compliance costs under each pathway are uniformly distributed across all affected facilities for the REMI analysis.
2) Extra market demand brought about by the upfront and recurring expenditures on control devices, which is able to generate a positive job impact in the labor market.
3) Permit application and renewal fees, which will increase the revenue of South Coast AQMD.

Finally, because parameter monitoring, inspection, maintenance, and recordkeeping are conducted in-house by facilities, the expenses on those items are modeled as an increase in compensation for the employees in respective industries, and thus, will not directly benefit other industries in the REMI modeling. Table 5 summarizes the inputs for the REMI simulation.

Table 5
Industries Incurring or Benefitting from Compliance Costs

Cost Categories	REMI Industries Incurring Compliance Costs (NAICS)	REMI Industries Benefitting from Compliance Spending (NAICS)
Multistage Scrubber APCD	All Industries in Table 2	Fabricated Metal Product Manufacturing (NAICS 332) Machinery Manufacturing (NAICS 333)
Source Test (Pathway A)		Professional, Scientific, and Technical Services (NAICS 54)
Source Test (Pathway B)		
Tank Solution Analysis (Pathway C)		
APCD Run and Maintenance Cost (Pathway A)		Utilities (NAICS 22) Fabricated Metal Product Manufacturing (NAICS 332) Machinery Manufacturing (NAICS 333)
ACPD Permitting Fees (Pathway A)		State and Local Government (NAICS 92)
APCD Permitting Fees (Pathway B)		
Permit Renewal Fees (Pathway A)		
Parameter Monitoring		NA*
Inspection (Pathway A)		
Specification Sheet Keeping (Pathway B)		
Maintenance (Pathway B)		
Nitric Acid Recordkeeping (Pathway C)		

Note: Parameter Monitoring, Inspection, Maintenance, and Recordkeeping are modeled as an increase in compensation for the employees in respective industries, and thus will not directly benefit other industries.

Regional Job Impacts

When the compliance cost is annualized using a 4% real interest rate, the model projects an annual average of 34 net jobs foregone from 2025 to 2052. The 34 annual jobs foregone represents approximately 0.0003% of total annual jobs in the four-county region.

The implementation of PR 1159.1 is expected to have different job impacts across various industries over time. For example, the sectors of Computer and Electronic Product Manufacturing (NAICS 334) and Retail Trade (NAICS 44-45) are both forecasted to forego three jobs on average over the forecast period. The biggest negative job impacts are expected to occur in 2033, when approximately 45 jobs foregone are expected in the four-county economy.

The largest job impact occurs in the Computer and Electronic Product Manufacturing sector (NAICS 334), largely because this sector comprises a significant proportion of the affected facilities, resulting in substantial compliance costs. Although the sector of Fabricated Metal Product Manufacturing (NAICS 332) incurs most of the compliance costs, the estimated job impact on this sector is not significant. This is due to the expected benefit from the expenditures on control devices, which offsets the negative job impact due to higher compliance costs. Note that different sectors of the economy are interconnected, and thus other sectors not directly incurring compliance costs may still be affected by the implementation of PR 1159. 1. As presented in Table 6, many major sectors of the regional economy would experience negative job impacts in later years from the secondary and induced effects of PR 1159.1 implementation.

It is important to note that these job impact projections are based on assumptions and analysis using the REMI model. The actual job impacts may vary depending on various factors and uncertainties in the economy and industry dynamics.

Table 6
Projected Job Impacts of PR 1159.1 for Selected Industries and Years

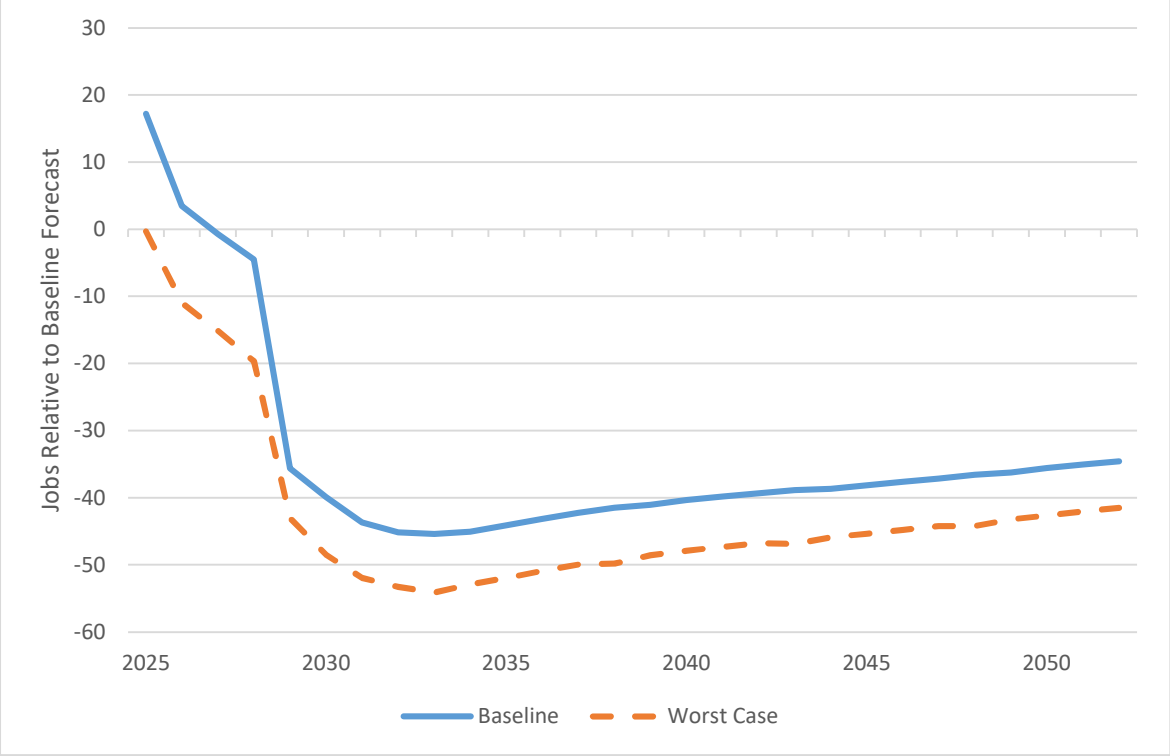
Industry (NAICS)	2025	2033	2041	2047	2052	Annual Average (2025-2052)	Baseline Number of Jobs (Average, 2025-2052)	Percent Relative to Baseline
Computer and electronic product manufacturing (334)	0	-4	-4	-4	-4	-3	119,920	-0.0025
Retail trade (44-45)	1	-4	-4	-3	-3	-3	900,003	-0.0003
Construction (23)	1	-7	-2	-1	-1	-3	572,529	-0.0005
State and Local Government (92)	2	-3	-3	-3	-3	-3	968,419	-0.0003
Real estate (531)	1	-3	-2	-2	-2	-2	768,038	-0.0003
Food services and drinking places (722)	1	-2	-2	-2	-2	-2	769,071	-0.0003
Administrative and support services (561)	1	-2	-2	-2	-2	-2	866,230	-0.0002
Ambulatory health care services (621)	1	-2	-2	-2	-2	-2	719,668	-0.0003
Professional, scientific, and technical services (54)	2	-2	-2	-2	-2	-1	1,044,065	-0.0001
Personal and laundry services (812)	0	-1	-1	-1	-1	-1	426,640	-0.0002
Fabricated metal product manufacturing (332)	4	-1	-2	-2	-2	-1	67,638	-0.0015
Other transportation equipment manufacturing (3364-3369)	0	0	0	0	0	0	64,554	0.0000
Machinery Manufacturing (333)	1	0	0	0	0	0	19,817	0.0000
Utilities (22)	0	0	0	0	0	0	21,495	0.0000
Other Industries	4	-14	-13	-13	-1	-11	5,323,428	-0.0002
All Industries	**17**	**-45**	**-40**	**-37**	**-35**	**-34**	**12,651,515**	**-0.0003**

Note: Totals may not sum due to rounding.

In addition, in 2013, South Coast AQMD contracted with Abt Associates Inc. to review the South Coast AQMD socioeconomic assessments for Air Quality Management Plans and individual rules with the goal of providing recommendations that could enhance South Coast AQMD's socioeconomic analyses. In 2014, Abt Associates Inc. published a report which included a recommendation for South Coast AQMD to enhance socioeconomic analyses by testing major assumptions through conducting a scenario analysis. As such, South Coast AQMD generally includes in Socioeconomic Impact Assessments an alternative worst-case scenario which assumes that the affected facilities would purchase all feasible monitoring equipment and services from providers located outside of the South Coast AQMD's jurisdiction.[9] This hypothetical scenario tests the sensitivity of the previously discussed scenarios where the analyses rely on REMI's embedded assumptions about how the capital and recurring spending would be distributed inside and outside the region. As a practical matter, however, increased jobs in the manufacturing and wholesale sectors related to the purchase of control devices are likely to be offered by local equipment manufacturers and wholesalers.

Figure 2 presents a projected time series of job impacts over the 2025 - 2052 period for both the standard and worst-case scenarios. This alternative worst-case scenario would result in an annual average of approximately 42 jobs foregone. The 42 jobs foregone represent a negligible portion of the average forecasted baseline jobs in the regional economy at an estimated 0.0003%.

Figure 2
Projected Regional Job Impacts, 2025-2052



[9] Abt Associates Inc., August 2014, Review of the SCAQMD Socioeconomic Assessments, Chapter 6, Section 3, https://www.aqmd.gov/docs/default-source/Agendas/aqmp/scaqmd-report---review-socioeconomic-assessments.pdf, accessed August 16, 2024.

Competitiveness

The additional cost brought on by PR 1159.1 would increase the cost of services rendered by the affected industries in the region. The magnitude of the impact depends on the size, diversification, and infrastructure in a local economy as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact described above with relative ease.

Meanwhile, changes in production and service costs would affect prices of locally produced goods. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed. The average price of a good at the place of use reflects prices of the locally produced goods and those imported from other locations.

According to the REMI Model, the implementation of PR 1159.1 will have minimal impact on the relative delivered price and the production cost across various sectors. Among all sectors, the Fabricated Metal Product Manufacturing sector will be the most affected, with the most significant impact occurring in 2029. In this year the relative delivered price and production cost in South Coast AQMD are expected to increase by 0.0064% and 0.0075%, respectively. On average, over the period from 2025-2059, the relative delivered price and production cost in the Fabricated Metal Product Manufacturing sector will be increased by 0.0051% and 0.0059%, respectively.

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