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SACRAMENTO FEDERAL OZONE NONATTAINMENT AREA
AIR QUALITY MANAGEMENT DISTRICTS

STATE IMPLEMENTATION PLAN REVISION FOR THE 2008 AND 2015 8-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD FOR THE SACRAMENTO FEDERAL NONATTAINMENT AREA

Proposed Contingency Measures and Reasoned Justification

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TABLE OF CONTENTS

INTRODUCTION

The El Dorado County Air Quality Management District (EDCAQMD), Feather River Air Quality Management District (FRAQMD), Placer County Air Pollution Control District (PCAPCD), Sacramento Metropolitan Air Quality Management District (SMAQMD), and Yolo-Solano Air Quality Management District (YSAQMD) are local regulatory air quality agencies with the primary responsibility for meeting and maintaining federal air quality health standards through adopting and enforcing air quality areawide, indirect and stationary source programs, air monitoring and planning as well as for administering air quality improvement grant programs and for the Sacramento Federal Ozone Nonattainment Area (SFNA). The SFNA region includes Sacramento and Yolo counties, the western portions of El Dorado and Placer counties, the southern portion of Sutter County, and the northeastern portion of Solano County.

In 2008 and 2015, the U.S. Environmental Protection Agency (EPA) promulgated a National Ambient Air Quality Standards (NAAQS) for Ozone (O_3) at a maximum daily 8-hour average of 75 parts per billion (ppb) for the 2008 standard and a maximum daily 8-hour average of 70 ppb for the 2015 standard. For the 2008 O_3 NAAQS, the SFNA did not meet the standard and is classified as a "severe" nonattainment area. For the 2015 O_3 NAAQS, the SFNA did not meet the standard and is classified as "serious" nonattainment area for the 2015 NAAQS. However, the SFNA air districts have requested a voluntarily reclassification to "severe" because additional time is needed to meet the standard. EPA is expected to take action to reclassify the SFNA.

The federal Clean Air Act (CAA) requires areas that are classified as nonattainment to develop State Implementation Plans (SIPs) that describes how the SFNA will attain the 2008 and 2015 O_3 standard through strategies that achieve air quality improvements. One requirement of the SIP is to include contingency measures. This document describes the CAA's requirements for contingency measures, the triggers, details of the contingency measures, and an infeasibility justification for nitrogen oxides (NOx) contingency measures. The CAA requires contingency measures to be implemented quickly if triggered when an area fails to make reasonable further progress (RFP) or attain the NAAQS by the attainment date. For the 2008 and 2015 O_3 NAAQS, the attainment dates are December 31, 2024, and August 3, 2033, respectively. Attainment of the 2008 and 2015 O_3 standards may be referenced by the attainment year, which is the last full O_3 season prior to the attainment date or years 2024 for the 2008 standard and 2032 for the 2015 standard.

The SFNA air districts have previously committed to adopting a contingency measure for architectural coatings in the 2015 O_3 NAAQS SIP. All SFNA air districts have adopted the architectural coatings contingency measure for both the 2008 and 2015 O_3 NAAQS. In addition to the already adopted SFNA contingency measures, the California Air Resources Board (CARB) adopted a California Smog Check Contingency Measure SIP revision[1] to help address the contingency measure requirements.

This document evaluates the additional need for contingency measures based on the requirements of EPA's Draft contingency measure guidance published in March 2023[2] for both the 2008 and 2015 O_3 NAAQS.

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[1] *California Smog Check Contingency Measure State Implementation Plan Revision*. California Air Resources Board. October 23, 2023.

[2] 88 FR 17571. March 23, 2023.

BACKGROUND

Contingency Measures Requirements

Clean Air Act Sections 172 and 182[3] require contingency measures to be implemented quickly if triggered when an area fails to make RFP or attain the NAAQS by the attainment date. The CAA specifies that SIPs must provide for contingency measures, defined in section 172(c)(9) as "specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date…." The CAA is silent though on the specific level of emission reductions that must come from contingency measures.

Over the last few years, multiple court decisions by the United States Court of Appeals for the Ninth Circuit (Ninth Circuit) and in other parts of the country have effectively disallowed the SIP-approved approach, which CARB, local air districts, and the rest of the country have historically used to meet contingency measure requirements.

As of 1992, in the absence of specific requirements for the amount of emission reductions required, EPA conveyed that the contingency measures should, at a minimum, ensure that an appropriate level of emissions reduction progress continues to be made if attainment of RFP is not achieved and additional planning by the State is needed[4]. Further, EPA ozone guidance states that "contingency measures should represent one year's worth of progress amounting to reductions of 3 percent of the baseline emissions inventory for the nonattainment area". EPA has accepted contingency measures that equal less than one year's worth of RFP when the circumstances fit under "EPA's long-standing recommendation that states should consider 'the potential nature and extent of any attainment shortfall for the area' and that contingency measures 'should represent a portion of the actual emissions reductions necessary to bring about attainment in the area.'"

Historically, EPA allowed contingency measure requirements to be met via excess emission reductions from ongoing implementation of adopted emission reduction programs, a method that CARB and local air districts have used to meet contingency measure requirements, and EPA has approved it in the past. In 2016, in Bahr v. EPA (Bahr), the Ninth Circuit determined EPA erred in approving a contingency measure that relied on an already-implemented measure for a nonattainment area in Arizona, thereby rejecting EPA's longstanding interpretation of section 172(c)(9). EPA staff interpreted this decision to mean that contingency measures must include a future action triggered by a failure to attain or failure to make RFP. This decision was applicable to the states covered by the Ninth Circuit. In the rest of the country, EPA still allowed contingency measures using their pre-Bahr stance.

In January 2021, in Sierra Club v. Environmental Protection Agency, the United States Court of Appeals for the D.C. Circuit, ruled that already implemented measures do not qualify as contingency measures for the rest of the country (Sierra Club). In response to Bahr and as part of the 75 ppb 8-hour ozone SIPs due in 2016, CARB developed the statewide Enhanced Enforcement Contingency Measure (Enforcement Contingency Measure) as a part of the 2018 Updates to the California State Implementation Plan to address the need for a triggered action as

[3] 42 U.S.C. §7502 and §7511a
[4] 57 FR 74. pp. 13510 & 13512. April 16, 1992

a part of the contingency measure requirement. CARB worked closely with EPA regional staff in developing the contingency measure package that included the triggered Enforcement Contingency Measure, a district triggered measure and emission reductions from implementation of CARB's mobile source emissions program. However, as part of the San Joaquin Valley 2016 Ozone Plan for 2008 8-hour Ozone Standard SIP action, EPA wrote in their final approval that the Enforcement Contingency Measures did not satisfy requirements to be approved as a "standalone contingency measure" and approved it only as a "SIP strengthening" measure. EPA did approve the district triggered measure and the implementation of the mobile reductions along with a CARB emission reduction commitment as meeting the contingency measure requirement for this SIP.

Subsequently, the Association of Irritated Residents filed a lawsuit against EPA for their approval of various elements within the San Joaquin Valley 2016 Ozone Plan for 2008 8-hour Ozone Standard, including the contingency measure. The Ninth Circuit issued its decision in Association of Irritated Residents v. EPA (AIR) that EPA's approval of the contingency element was arbitrary and capricious and rejected the triggered contingency measure that achieves much less than one year's worth of RFP. Most importantly, the Ninth Circuit said that, in line with EPA's longstanding interpretation of what is required of a contingency measure and the purpose it serves, together with Bahr, all reductions needed to satisfy the CAA's contingency measure requirements need to come from the contingency measure itself and the amount of reductions needed for contingency should not be reduced by the fact of surplus emission reductions from ongoing programs absent EPA formally changing its historic stance on the amount of reductions required.

Considering more recent court decisions[5,6], EPA released a draft contingency measure guidance in March 2023. The guidance interprets the court decisions to mean that triggered contingency measures must achieve the entirety of the required one year's worth of emission reductions on their own. The draft guidance proposes a new method for how to calculate one year's worth of progress needed for contingency and provides new clarification on the reasoned justification that would be needed for measures to be approved with a lesser amount of reductions. The guidance effectively reduces the amount of VOC reductions needed but adds an amount of NOx reductions needed. This analysis is based on the draft guidance[7] published by EPA on March 23, 2023.

SFNA 2008 O_3 NAAQS SIP

The SFNA air districts adopted the Sacramento Regional 2008 NAAQS 8-hour Ozone Attainment and Reasonable Further Progress Plan (2008 O_3 SIP) that address how the Sacramento region will attain the 2008 O_3 NAAQS. The 2008 O_3 SIP was submitted to CARB, and CARB approved and submitted it to EPA on December 18, 2017. Actions by EPA to approve or disapprove the 2008 O_3 SIP were delayed in part due to court decisions discussed previously. In collaboration with the SFNA air districts and other California air districts with nonattainment areas, CARB developed and adopted the 2018 Updates to the California State Implementation Plan (2018 SIP Update), to address the issues identified by the court findings.

A Final Rule was issued by the EPA in the Federal Register on October 22, 2021[8], approving all revisions to the SIP except for the contingency measures revision where EPA deferred final action

[5] Sierra Club v. Environmental Protection Agency, (D.C. Cir. 2021) 985 F.3d 1055.
[6] Association of Irritated Residents v. U.S. Environmental Protection Agency, (9th Cir. 2021) 10 F.4th 937
[7] *Draft: Guidance on the Preparation of State Implementation Plan Provisions That Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter*. U.S. Environmental Protection Agency. March 16, 2023
[8] 86 FR 58581. October 22, 2021.

due to a court decision on approving SIP contingency measures. On June 15, 2023, EPA disapproved the SFNA SIP contingency measures because the 2008 O_3 SIP did not include measures that would be triggered if the area fails to attain the NAAQS by the attainment date or make reasonable further progress[9]. EPA's disapproval started a sanctions clock, which required the SFNA air districts to correct the contingency measure deficiencies and obtain full SIP approval within 18 months (by January 17, 2025); otherwise, the emission reduction credit offset ratio will increase to 2:1. If no corrections are made within 6 months of the increased offset ratio sanction, EPA must withhold highway funds to the nonattainment area. In addition, EPA must promulgate a Federal Implementation Plan (FIP) within 24 months of EPA's disapproval if the contingency measure deficiencies are not corrected.

The SFNA air districts propose to address the contingency measure deficiencies by adopting this SIP revision and contingency measures detailed in this document and submitting it to EPA. Once EPA approves this SIP revision and the adopted contingency measures, the sanctions clock will end, and EPA will no longer be required to promulgate a FIP for the SFNA.

SFNA 2015 O_3 NAAQS SIP

In Fall 2023, the SFNA air districts adopted the Sacramento Regional 2015 NAAQS 8-Hour Ozone Attainment & Reasonable Further Progress Plan. This plan was adopted by CARB on October 26, 2023, and forwarded to EPA for final review and approval[10]. In the plan, the SFNA air districts committed to amend their architectural coating rules to help meet the contingency measure requirements and to evaluate additional local control measures in accordance with EPA's guidance on contingency measures once the guidance is finalized. At the time of this document, the guidance has not been finalized but the SFNA will nonetheless need to evaluate contingency measures. This document evaluates the additional need for contingency measures based on the requirements of EPA's Draft contingency measure guidance.

ONE YEAR'S WORTH (OYW) OF PROGRESS

The contingency measure guidance specifies a calculation method for determining the necessary contingency measure emissions reductions for both VOC and NOx. The required reductions of VOC and NOx are referred to as "one year's worth (OYW) of progress." The guidance specifies the following calculation method to determine the OYW of progress:

$$\frac{(base\ year\ EI - attainment\ year\ EI\ )}{(attainment - base\ year)} \div base\ year\ EI\ \times attainment\ year\ EI = OYW\ of\ Progress$$

For the SFNA, Tables 1 and 2 identify SFNA's OYW of progress required for VOC and NOx for both the 2008 and 2015 O_3 NAAQS. The SIP emission inventory for the 2008 O_3 NAAQS used CARB's California Emissions Projection Analysis Model (CEPAM) 2016, where the emissions forecasts were projected from a 2011 base year, and the 2015 O_3 NAAQS used CEPAM 2019, where the emissions forecasts were projected from a 2017 base year.

[9] 88 FR 39179. June 15, 2023.
[10] California Air Resources Board. Letter from Steven S. Cliff, Executive Officer to Martha Guzman. November 17, 2023.

Table 1: OYW of Progress for the SFNA for 2008 O_3 NAAQS			
Pollutant	**Total SFNA 2008 SIP Inventory[11] (tpd)**		**OYW of Progress (tpd)**
	2011	**2024**	**2024**
NOx	107.7	46.6	2.03
VOC	111.6	82.9	1.64

Table 2: OYW of Progress for the SFNA for 2015 O_3 NAAQS			
Pollutant	**Total SFNA 2015 SIP Inventory[12] (tpd)**		**OYW of Progress (tpd)**
	2017	**2032**	**2032**
NOx	70.6	34.2	1.18
VOC	96.6	79.9	0.92

VOC CONTINGENCY MEAUSURES FOR THE 2008 AND 2015 O_3 NAAQS

The SFNA air districts have identified the VOC contingency measures to meet the required OYW of progress for both the 2008 and 2015 O_3 NAAQS. The VOC contingency measure reductions are provided by the already adopted SFNA air districts' architectural coating rules and CARB's Smog Check contingency measure, and local commitments to adopt or amend rules for composting operations, liquid petroleum gas transfer and dispensing, and solvent cleaning. For the purposes of showing that the SFNA has the emission reductions to meet OYW of Progress, the estimated emission reductions will be calculated for the attainment years, 2024 for the 2008 O_3 NAAQS and 2032 for the 2015 O_3 NAAQS, even though the emission reductions from contingency measures, if triggered, will not be realized in those years. For the 2008 O_3 NAAQS, the 2024 emissions reductions are calculated based on the emission inventory from CEPAM2016, and for the 2015 O_3 NAAQS, the 2032 emissions reductions are based the emission inventory from CEPAM2019. The already adopted and proposed SFNA commitments for VOC contingency measures are:

[11] California Air Resources Board. *CEPAM: 2016 SIP - Standard Emission Tool, Emission Projections By Summary Category, Base Year: 2012. https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php.* Updated February 16, 2017.

[12] California Air Resources Board. *CEPAM: 2019 SIP - Standard Emission Tool, Emission Projections By Summary Category, Base Year: 2017. https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php.* Updated April 28, 2022.

Table 3: SFNA Commitments for Contingency Measures				
Contingency Measure by District	**Rule(s)**	**Estimated 2024 VOC Reductions (tpd)**	**Estimated 2032 VOC Reductions (tpd)**	**Adoption Date**
Architectural Coatings				
EDAQMD	215	0.002	0.003	Adopted July 16, 2024
FRAQMD	3.15	0.001	<0.001	Adopted June 3, 2024
PCAPCD	218	0.133	0.016	Adopted June 13, 2024
SMAQMD	442	0.279	0.092	Adopted July 25, 2024
YSAQMD	2.14	0.074	0.032	Adopted May 8, 2024
Composting				
SMAQMD	None	0.092	0.092	Anticipated: October 2024
YSAQMD	None	0.60	0.82	Anticipated: October 2024
LPG Transfer and Dispensing				
SMAQMD	None	0.196	0.196	Anticipated: October 2024
Solvent Cleaning				
PCAPCD	216/240	0.302	0.420	Anticipated October 2024
Total SFNA VOC Reductions		1.679	1.672	
CARB Smog Check[13] VOC Reduction		0.037	0.015	Adopted October 26, 2023
Total SFNA VOC Commitment		1.716	1.687	
OYW for Progress for VOC		1.64	0.92	

Consistent with the draft contingency measure guidance, the adopted and committed measures meet the OYW of progress for VOC emission reductions in the SFNA, and no other VOC contingency measures need be considered. Detailed evaluations of the VOC contingency measures are included in Appendix A.

JUSTIFICATION OF LESS THAN OYW OF PROGRESS FOR NOX REDUCTIONS

The already adopted and committed VOC contingency measure will meet the OYW of progress for VOC; however, the SFNA air districts have not identified enough feasible NOx contingency measures. EPA's draft guidance allows for providing less than OYW of progress as long as it is supported by a reasoned justification[14]. The guidance provides nonattainment areas, such as the SFNA, that are seeking to satisfy the contingency measure requirement with less than OYW of progress, based on lack of feasible measures, to conduct and submit an "infeasibility justification." The infeasibility justification needs to show that for any remaining infeasible measures, the air

[13] *California Smog Check Contingency Measure State Implementation Plan Revision*. California Air Resources Board. October 23, 2023. pp. 29-31.

[14] *Draft: Guidance on the Preparation of State Implementation Plan Provisions That Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter*. U.S. Environmental Protection Agency. March 16, 2023. pp.29-40

agency must document why it reached the conclusion that each measure is infeasible, including whether the conclusion is based on technological or economic infeasibility.

Table 4 shows the SFNA NOx planning emissions inventory for the attainment years of 2024 for the 2008 O_3 NAAQS and 2032 for the 2015 O_3 NAAQS. For each of the largest sources of NOx which are identified as a category at or above 1 percent of the total inventory, the SFNA air districts evaluated NOx measures for categories that exceed 1% of the total NOx emissions inventory as shown in Table 4.

The significant source categories of NOx emissions in the SFNA are:

1. Mobile sources;
2. Residential fuel combustion (space and water heating, cooking, and wood burning fireplaces and stoves);
3. Electric utilities (turbines, internal combustion (IC) engines, and biomass boilers);
4. Food and agricultural processing (IC engines and boilers);
5. Manufacturing and industrial (boilers, dryers, ovens, space heaters, IC engines, and process heaters);
6. Service and commercial (boilers, dryers, ovens, space heaters and IC engines);
7. Mineral processing operations (ovens and asphaltic concrete dryers); and
8. Other fuel combustion.

The largest source category of NOx in the SFNA is mobile sources, which is approximately 75 to 80% of the NOx emissions inventory. The SFNA air districts do not have the authority to reduce emissions from this category of emissions other than through incentive programs to encourage the use of cleaner technology. Consistent with EPA's conclusion for the San Joaquin Valley, the overwhelming amount of mobile source emissions for NOx significantly limits the ability for the SFNA to achieve OYW of NOx reductions from contingency measures[15]. Mobile sources generally fall under the jurisdiction of the federal government to establish controls, unless the state qualifies for and has obtained a waiver. California has obtained a waiver from the federal over some mobile sources, and CARB has evaluated opportunities for contingency measures in it program as part of California Smog Check Contingency Measure SIP revision[16]. Besides the Smog Check contingency measures, CARB was unable to identify any other opportunities for contingency measures (see discussion below). Further action is needed by EPA to adequately address the emissions from mobile sources.

Except for mobile sources, the other sources are stationary sources, and the NOx emission are from the combustion processes, such as internal combustion engines, boilers, water heaters, space heaters, furnaces, dryers, turbines, flares, fireplaces and woodstoves. Local air districts may adopt rules and regulations for these stationary sources. Each control measure for these stationary sources and its infeasibility as a contingency measure are summarized below in the "Infeasibility Justification of Local NOx Control Measures" section and discussed in Appendix B.

[15] "EPA Source Category and Control Measure Assessment and Reasoned Justification Technical Support Document. Proposed Contingency Measures Federal Implementation Plan for the Fine Particulate Matter Standards for San Joaquin Valley, California." U.S. Environmental Protection Agency, Region IX. p. 8. July 2023.

[16] *California Smog Check Contingency Measure State Implementation Plan Revision*. California Air Resources Board. October 23, 2023.

CARB's Analysis of Additional Contingency Measures

In CARB's California Smog Check Contingency Measure SIP Revision released on September 15, 2023[17], CARB evaluated potential options for contingency measures within each of CARB's regulations consistent with EPA's draft contingency measure guidance if any additional contingency measures were feasible statewide. CARB identified the difficulties of contingency measures to provide large amount of reductions within two years of a triggering event for regulations that rely on accelerated turnover of older engines/trucks such as the In-Use Locomotive Regulation, advanced Clean Fleets, and Transportation Refrigeration Unit II. CARB concluded that due to the need for buildout of potential infrastructure upgrades and market-readiness of new equipment options are infeasible for contingency measure reductions.

Additionally, CARB's commitment to driving sources of air pollution in California to zero-emissions everywhere feasible as expeditiously as possible limits possibilities of contingency measures. One part of CARB's zero-emissions commitment is the recent rulemaking that will ban the sale of new gas furnace and water heaters in California starting in 2030 making contingency measure reductions in these categories infeasible.

At this time, CARB only identified the California Smog Check Contingency Measure. CARB did not identify any other feasible contingency measures. CARB's Smog Check Contingency Measure includes a NOx reduction of 0.077 tpd in 2024, and 0.047 tpd in 2032 for the SFNA. The Smog Check Contingency Measure was adopted on October 26, 2023.

Infeasibility of Transportation Control Measures

Vehicular emissions can be reduced through implementation of Transportation Control Measures (TCMs), which are strategies that reduce transportation-related air pollution and fuel use by reducing vehicle miles traveled and improving roadway operations[18]. TCMs may reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion. In the SFNA, SACOG is the primary Metropolitan Planning Organization (MPO) for the greater Sacramento region (includes Sacramento, Yolo, Placer, El Dorado, Sutter, and Yuba Counties). SACOG provides transportation planning and funding for the region and has worked with local governments and the SFNA air districts to develop and implement TCMs. For example, one of the TCMs developed for the previous attainment plans for the SFNA is the Spare The Air program, a program that has achieved a high level of public awareness.

TCMs are not feasible contingency measures because TCMs have to be developed through the area's transportation planning process, which can take a significant amount of time and are funded to a large degree by the Federal Highway Administration and the Federal Transit Administration based on transportation improvement programs developed by the MPOs in the area. Therefore, given the time it would take to advance these projects through the planning and funding processes, TCMs are not a feasible contingency measure.

[17] *California Smog Check Contingency Measure State Implementation Plan Revision*. California Air Resources Board. October 23, 2023. pp. 7-12.

[18] "Transportation Control Measures – Information Document for Developing and Implementing Emissions Reductions Programs." U.S. Environmental Protection Agency. EPA-430-09-040. March 2011.

Table 4: SFNA NOx Planning Inventories

Source Category	2024 SFNA NOx Emissions (tpd)	% of 2024 SFNA NOx Inventory	2008 < 1% of Total SFNA Inventory?	2032 SFNA NOx Emissions (tpd)	% of 2032 SFNA NOx Inventory	2015 < 1% of Total SFNA Inventory?
010-ELECTRIC UTILITIES	**1.40**	3.01%	No	1.25	3.66%	No
020-COGENERATION	**0.01**	0.02%	Yes	0.01	0.03%	Yes
030-OIL AND GAS PRODUCTION (COMBUSTION)	**0.05**	0.10%	Yes	0.03	0.09%	Yes
050-MANUFACTURING AND INDUSTRIAL	**1.46**	3.13%	No	1.19	3.47%	No
052-FOOD AND AGRICULTURAL PROCESSING	**0.87**	1.87%	No	0.72	2.10%	No
060-SERVICE AND COMMERCIAL	**1.56**	3.34%	No	1.78	5.20%	No
099-OTHER (FUEL COMBUSTION)	**0.52**	1.12%	No	0.29	0.84%	Yes
110-SEWAGE TREATMENT	**0.00**	0.00%	Yes	0.00	0.01%	Yes
120-LANDFILLS	**0.04**	0.09%	Yes	0.05	0.16%	Yes
130-INCINERATORS	**0.02**	0.05%	Yes	0.05	0.15%	Yes
140-SOIL REMEDIATION	**0.00**	0.00%	Yes	0.00	0.00%	Yes
199-OTHER (WASTE DISPOSAL)	**0.00**	0.00%	Yes	0.00	0.01%	Yes
210-LAUNDERING	**0.00**	0.00%	Yes	0.00	0.00%	Yes
220-DEGREASING	**0.00**	0.00%	Yes	0.00	0.00%	Yes
230-COATINGS AND RELATED PROCESS SOLVENTS	**0.01**	0.03%	Yes	0.01	0.04%	Yes
240-PRINTING	**0.01**	0.01%	Yes	0.00	0.00%	Yes
250-ADHESIVES AND SEALANTS	**0.00**	0.00%	Yes	0.00	0.00%	Yes
299-OTHER (CLEANING AND SURFACE COATINGS)	**0.00**	0.00%	Yes	0.00	0.00%	Yes
310-OIL AND GAS PRODUCTION	**0.00**	0.00%	Yes	0.00	0.01%	Yes
320-PETROLEUM REFINING	**0.00**	0.00%	Yes	0.00	0.00%	Yes
330-PETROLEUM MARKETING	**0.01**	0.02%	Yes	0.02	0.04%	Yes
399-OTHER (PETROLEUM PRODUCTION AND MARKETING)	**0.00**	0.00%	Yes	0.00	0.00%	Yes
410-CHEMICAL	**0.17**	0.38%	Yes	0.08	0.23%	Yes
420-FOOD AND AGRICULTURE	**0.02**	0.04%	Yes	0.02	0.04%	Yes
430-MINERAL PROCESSES	**0.49**	1.05%	No	0.40	1.17%	No
440-METAL PROCESSES	**0.01**	0.02%	Yes	0.01	0.03%	Yes
450-WOOD AND PAPER	**0.05**	0.10%	Yes	0.04	0.13%	Yes
470-ELECTRONICS	**0.00**	0.00%	Yes	0.00	0.00%	Yes
499-OTHER (INDUSTRIAL PROCESSES)	**0.03**	0.07%	Yes	0.03	0.08%	Yes
510-CONSUMER PRODUCTS	**0.00**	0.00%	Yes	0.00	0.00%	Yes
520-ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVE	**0.00**	0.00%	Yes	0.00	0.00%	Yes
530-PESTICIDES/FERTILIZERS	**0.00**	0.00%	Yes	0.00	0.00%	Yes
540-ASPHALT PAVING / ROOFING	**0.00**	0.00%	Yes	0.00	0.00%	Yes
610-RESIDENTIAL FUEL COMBUSTION	**1.85**	3.97%	No	1.82	5.32%	No
620-FARMING OPERATIONS	**0.00**	0.00%	Yes	0.00	0.00%	Yes
630-CONSTRUCTION AND DEMOLITION	**0.00**	0.00%	Yes	0.00	0.00%	Yes
640-PAVED ROAD DUST	**0.00**	0.00%	Yes	0.00	0.00%	Yes
645-UNPAVED ROAD DUST	**0.00**	0.00%	Yes	0.00	0.00%	Yes
650-FUGITIVE WINDBLOWN DUST	**0.00**	0.00%	Yes	0.00	0.00%	Yes
660-FIRES	**0.01**	0.03%	Yes	0.02	0.05%	Yes
670-MANAGED BURNING AND DISPOSAL	**0.29**	0.62%	Yes	0.32	0.94%	Yes
690-COOKING	**0.00**	0.00%	Yes	0.00	0.00%	Yes
699-OTHER (MISCELLANEOUS PROCESSES)	**0.00**	0.00%	Yes	0.00	0.00%	Yes
710 through 890 Mobile Source Categories	**37.68**	80.93%	No	26.04	76.22%	No
Grand Total	**46.55**	100.00%		**34.16**	100.00%	

Infeasibility Justification of Local NOx Control Measures

The SFNA air districts evaluated local NOx control measures for each NOx emissions category ≥ 1 percent of the total SFNA inventory for feasibility. The summary of the evaluations and the reasons for infeasibility are shown in Table 5; detailed infeasibility justifications for each NOx measure are included in Appendix B. All identified SFNA NOx control measures require equipment replacements or retrofits to meet more stringent NOx requirements. As a result, the identified NOx control measures are disqualified as contingency measures due to:

1) The infeasibility of achieving NOx reductions within one or two years of a triggering event. For any permitted source that would be subject to these control measures, the time to apply for and obtain permits (permitting within in the SFNA requires both a pre-construction and operating (post-construction) permits), perform engineering/design evaluation, and purchase, install, and test replaced or retrofitted equipment in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible. For point-of-sale measures, the required turnover of existing units makes reductions negligible within 2 years of a triggering event; and/or
2) Control measures are already committed as part of the State SIP Strategy;
3) Control measures are not cost-effective; and/or
4) No other most stringent controls were identified.

Table 5: Evaluated NOx Contingency Measures

Control Measure	Opportunity for Reductions	Infeasibility Reasons
Asphaltic Concrete	Identified lower NOx emission limits identified in SCAQMD Rule 1147.1 adopted in 2021.	Infeasible of achieving reductions within the contingency measure time period and not cost effective within the SFNA.
Boilers	Identified lower limits in SCAQMD Rule 1146.1 and San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rules 4306 and 4320.	Infeasible of achieving reductions within the contingency measure time period and not cost effective within the SFNA.
Biomass Boilers	No other more stringent controls were identified	No other more stringent controls were identified
Flares	Identified controls consistent with SJVUAPCD Rule 4311 to reduce emissions from flaring operations.	Infeasible of achieving reductions within the contingency measure time period and not cost effective within the SFNA.
Furnaces (Residential)	Identified “point of sale” NOx limits and potential reductions from requiring electrification of new units.	Infeasible of achieving reductions due to point-of-sale mechanism for this category. The required turnover of existing units makes reductions negligible within 2 years of a triggering event. In addition, CARB has committed as part of the 2022 State SIP Strategy to adopt by 2025 a zero-emission standard for new gas furnace in California, disqualifying this measure as a contingency measure.

IC Engines	Identified lower limits in SCAQMD Rule 1110.2.	Infeasible of achieving reductions within the contingency measure time period and not cost effective within the SFNA.
Miscellaneous Combustion	Identified lower limits in SCAQMD Rule 1147.	Infeasible of achieving reductions within the contingency measure time period and not cost effective within the SFNA.
Water Heaters (Residential) – Less than 1 mmBtu/hr	Identified lower limits in BAAQMD, which recently adopted zero emission regulations for furnaces and water heaters starting in 2027 for water heaters and 2029 for space heaters.	Infeasible of achieving reductions within the contingency measure time period due to the point-of-sale mechanism for this category. The required turnover of existing units makes reductions negligible within 2 years of a triggering event. In addition, CARB has committed as part of the 2022 State SIP Strategy to adopt by 2025 a zero-emission standard for new gas water heater in California, disqualifying this measure as a contingency measure.
Turbines	Identified more stringent limits identified in SCAQMD and SJVUAPCD.	Infeasible of achieving reductions within the contingency measure time period.

PUBLIC OUTREACH/COMMENTS

The districts of the SFNA will hold a public workshop to discuss the contingency measures for the 2008 and 2015 O_3 NAAQS. A notice for the workshop will be sent by e-mail and/or U.S. mail (if requested) to interested parties, including the affected sources and all those who have requested planning and rulemaking notices, and published on the air districts' website. In addition, each contingency measure will conduct a separate public workshop to discuss specific changes in the measure.

ENVIRONMENTAL REVIEW

In this SIP revision, the District is not proposing any changes to air district rules. Staff has determined that the adoption of this Contingency Measure Analysis SIP revision is exempt from the California Environmental Quality Act (CEQA) as an action by a regulatory agency for the protection of the environment (Class 8 Categorical Exemption, Section 15308, State CEQA Guidelines) and because it can be seen with certainty that there is no possibility that the activity in question may have a significant adverse effect on the environment (Section 15061(b)(3), State CEQA Guidelines).

CONCLUSION

Staff is proposing to submit for SIP approval the contingency measure analysis and the contingency measures as specified in Table 3 to satisfy the contingency measure requirements for the 2008 and 2015 O_3 NAAQS. This analysis also demonstrates the lack of achievable NOx contingency measures consistent with the infeasibility analysis allowed by EPA's Draft Contingency Measure Guidance.

REFERENCES

California Air Resources Board. *California Smog Check Contingency Measure State Implementation Plan Revision.* Sacramento, CA. September 15, 2023.

California Air Resources Board*. CEPAM: 2016 SIP – Standard Emission Tool, Emission Projections By Summary Category, Base Year: 2012. <https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php>.* Sacramento: California Air Resources Board. Updated February 16, 2017.

California Air Resources Board*. CEPAM: 2019 SIP – Standard Emission Tool, Emission Projections By Summary Category, Base Year: 2017. <https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php>.* Sacramento: California Air Resources Board. Updated April 28, 2022.

Draft Guidance on the Preparation of State Implementation Plan Provisions That Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, Federal Register 88:56 (March 23, 2023) p. 17571.

"Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements", Federal Register 83:234 (December 6, 2018) p. 62998.

U.S. Environmental Protection Agency, Region IX. *EPA Proposed Contingency Measures Technical Support Document. Proposed Contingency Measures Federal Implementation Plan for the Fine Particulate Matter Standards for San Joaquin Valley, California.* San Fransisco, CA. July 23.

U.S. Environmental Protection Agency. *Transportation Control Measures – Information Document for Developing and Implementing Emissions Reductions Programs.* EPA-430-09-0404. March 2011.

APPENDIX A
SFNA COMMITMENTS FOR VOC CONTINGENCY MEASURES

Based on EPA's Draft Contingency Measure Guidance, the SFNA air districts has identified VOC reductions from feasible contingency measures in the SFNA to meet OYW of Progress for VOC for both the 2008 and 2015 O_3 NAAQS. The VOC contingency measures are shown in the table below. Further discussion is provided below.

Table A-1: SFNA Commitments for Contingency Measures

Contingency Measure by District	Rule(s)	Estimated 2024 VOC Reductions (tpd)	Estimated 2032 VOC Reductions (tpd)	Adoption Date
Architectural Coatings				
EDAQMD	215	0.027	0.003	Adopted July 16, 2024
FRAQMD	3.15	0.001	<0.001	Adopted June 3, 2024
PCAPCD	218	0.133	0.016	Adopted June 13, 2024
SMAQMD	442	0.279	0.092	Adopted July 25, 2024
YSAQMD	2.14	0.074	0.032	Adopted May 8, 2024
Composting				
SMAQMD	None	0.083	0.083	Anticipated: October 2024
YSAQMD	None	0.60	0.82	Anticipated: October 2024
LPG Transfer and Dispensing				
SMAQMD	None	0.196	0.196	Anticipated: October 2024
Solvent Cleaning				
PCAPCD	216/240	0.302	0.420	Anticipated: October 2024
Total SFNA VOC Reductions		1.679	1.672	
CARB Smog Check[19] VOC Reduction		0.037	0.015	Adopted October 26, 2023
Total SFNA VOC Reduction		1.719	1.687	
OYW of VOC		1.64	0.92	

Architectural Coatings (Adopted by All Air District)

This control measure regulates the volatile organic compound (VOC) content of architectural coatings applied to stationary structures and their appurtenances. These coatings include general use flat and non-flat coatings as well as specialty coating coatings, such as industrial maintenance coatings, lacquers, floor coatings, roof coatings, and stains. This contingency measure has already been adopted by all air districts of the SFNA.

[19] Ibid. pp. 29-31.

Composting Operations (SMAQMD and YSAQMD)

This control measure regulates emissions of volatile organic compounds (VOC) from new and existing composting operations. The control measure establishes best management practices and/or VOC emission control technology (for larger composting operations) such as enclosures, aerated static piles, or other emission control devices.

Currently, no district in the SFNA has a rule covering this source category.

Potential controls

The controls for the composting operations control measure are based on SCAQMD Rule 1133.3 – Emission Reductions from Greenwaste Composting Operations. SCAQMD Rule 1133.3 defines greenwaste composting as composting operations having up to 20% percent manure content. The rule has various levels of controls depending on the throughput of organic material and/or greenwaste at the composting facility. Rule 1133.3 requires cover (with screened or unscreened finished compost) on each active phase compost pile within 24 hours of formation and the application of water as necessary to the top of the compost pile within six hours prior to turning, such that the top half of the pile is wet to a depth of three inches. Under Rule 1133.3, two composting facilities in the SFNA (one located in the SMAQMD and one located in the YSAQMD) would be subject to similar requirements.

Composting Emissions Inventory

EIC codes	District	Description	VOC Inventory for Composting Contingency Measure (tpd)	
			2024	2032
330-319-0120-0000	SMAQMD	COMPOSTING	0.252	0.251
199-190-0010-0000 410-436-5800-0000	YSAQMD	COMPOSTING	4.48*	5.59*
		Total	4.73	5.84

* YSAQMD has two permitted composting facilities.

Composting Emission Reductions

EIC codes	District	Description	VOC Reduction for Composting Contingency Measure (tpd)	
			2024	2032
330-319-0120-0000	SMAQMD	COMPOSTING	0.083	0.083
199-190-0010-0000 410-436-5800-0000	YSAQMD	COMPOSTING	0.6**	0.82**
		Total	3.02	3.69

**One permitted facility will be subject to this contingency control measure. The other permitted facility has recently moved their operation and is already subject to requirements more stringent than the requirements specified in this control measure.

Feasibility

The SCAQMD amendments to Rule 1133.1 & 1133.3 estimated a cost-effectiveness of $1,340 per ton of VOC reduction ($0.67 per pound of VOC reduced). To adjust this to 2031 dollars, the cost-effectiveness is $2,158 per ton of VOC reduced ($1.08 per pound of VOC reduced).

The contingency measure is cost-effective and feasible within the contingency measure time period as the controls are based on best management practices and do not require equipment changes.

LPG Transfer and Dispensing (SMAQMD)

Liquefied petroleum gas (LPG) is a colorless, odorless, and non-toxic gas that is compressed and stored as a liquid. LPG is about 1.5 times heavier than air in the vapor state. LPG is considered a volatile organic compound (VOC).

After LPG is produced, it is transported to multiple destinations through a series of storage facilities, rail cars, tank trucks, bobtails, and various size cylinders. There are three sources of fugitive emissions during each LPG transfer or dispensing event; 1) leaks from the equipment used to transfer the LPG, 2) entrapped liquid and vapor in the connector housings that is released to the atmosphere upon disconnection, and 3) liquid and vapor released from the open fixed liquid level gauge (FLLG) used to vent the tank and prevent overfilling.

Currently, no district in the SFNA has a rule covering this source category.

Potential controls

This contingency measure is based on adopting the requirements of South Coast AQMD Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing. Identical requirements are included in Ventura County APCD Rule 74.33. Emissions can be reduced by two methods: decreasing the size of the orifice on the fixed liquid level gauge (FLLG), which is opened during the filling of LPG cylinders, and by using low emission connectors that reduce the amount of LPG entrapped in the connector housing. Using a FLLG with a smaller orifice reduces the fugitive emissions by about 50%, while using low-emission connectors reduces the fugitive emissions by varying amounts, depending on the type of LPG transfer and size of the connectors.

LPG Transfer and Dispensing Emissions Inventory

EIC codes	Description	VOC Inventory for Control Measures (tpd)	
		2024	2032
330-319-0120-0000	LPG TRANSFER AND DISPENSING LOSSES	0.5693	0.5693
	Total	0.5693	0.5693

LPG Transfer and Dispensing Emissions Reductions

EIC codes	Description	VOC Inventory for Control Measures (tpd)	
		2024	2032
330-319-0120-0000	LPG TRANSFER AND DISPENSING LOSSES	0.196	0.196
	Total	0.196	0.196

Feasibility

The contingency measure is cost-effective and feasible within the contingency measure time period as the controls are based on best management practices and do not require equipment changes. Both SCAQMD and VCAPCD implemented the rule within one year (SCAQMD effective date was one year and VCAPCD effective date was less than six months).

Solvent Cleaning (PCAPCD)

Solvents are used in many cleaning operations including cleaning of products during manufacturing processes; cleaning of surfaces prior to application of coatings, adhesives, sealants, or inks; cleanup of application equipment; cleaning for repair and maintenance; and cleaning of tools and work surfaces. Cleaning may be performed using degreasers, or outside degreasers using wipe cleaning or other means. VOCs are emitted from the evaporation of organic solvents.

PCAPCD Rule 240, Surface Preparation and Cleanup, reduces emissions from cleaning operations from hand-wiping type cleaning and degreasing operations. Currently, Rule 240 requires that solvents used in most cleaning applications contain 50 g/l or less of VOC, with higher limits for special operations such as cleaning of electrical/electronic components (100 g/l) and medical devices (800 g/l). This VOC limit applies on the surface prep and cleanup activities that are not regulated by other existing district VOC rules. For example, metal parts and products, wood coating operations, automotive refinishing, and etc. all currently have a lower VOC limit (25 g/l) for surface prep and cleanup.

PCAPCD Rule 216, Organic Solvent Cleaning and Degreasing Operations, reduces emissions from degreasers. Rule 216 requires cold cleaners and vapor degreases to meet specific design requirements. Currently, Rule 216 requires non-vapor degreasers use solvents with a VOC content of 50 grams per liter or less.

Potential controls

The following rules were reviewed and compared to PCAPCD's Rule 240 and 216:

- SMAQMD Rule 466 and 454
- SCAQMD Rules 1122 and 1171
- SJVUPACD Rules 4661, 4662, and 4663
- BAAQMD Rule 8-4

- VCAPCD Rules 74.6 and 74.6.1
- SDAPCD Rules 67.6.1 and 67.6.2

The rules referenced above set a VOC limit for general wipe cleaning and degreasing at 25 g/l. The contingency measure will implement a 25 g/l for general wipe cleaning and degreasing in PCACPD Rules 216 and 240.

Emission Inventory

The following table summarizes the VOC emissions from related EIC categories subject to PCAPCD Rule 216 and 240 requirements for 2024 and 2032 for the 2008 and 2015 O_3 NAAQS, respectively:

EIC Category	Description	VOC Inventory for Control Measure (tpd)	
		2024	2032
220- 204- 0500- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – PETROLEUM NAPTHA	0.2641	0.2824
220- 204- 3008- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – ACETONE	0.0049	0.0000
220- 204- 3022- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) ALCOHOLS	0.0338	0.0349
220- 204- 3083- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – CFC'S	0.0045	0.0046
220- 204- 3176- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – GLYCOL ETHERS	0.0029	0.0030
220- 204- 3204- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – KETONES	0.0005	0.0006
220- 204- 3246- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) METHYLENE DICHLORIDE	0.0000	0.0000
220- 204- 3333- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TERPENES	0.0151	0.0156
220- 204- 3339- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TOLUENE/XYLENE	0.0012	0.0012
220- 204- 3344- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TCA	0.0000	0.0000
220- 204- 8106- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – BLENDS	0.1030	0.1099
220- 206- 3083- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – CFC'S	0.0019	0.0019
220- 206- 3107- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – DICHLOROFLUOROETHANE	0.0002	0.0003
220- 206- 3301- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – PERFLUOROCARBONS	0.0006	0.0000
220- 206- 3344- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – TRICHLOROETHANE	0.0000	0.0000
220- 208- 0500- 0000	208-HANDWIPING – PETROLEUM NAPTHA	0.0754	0.0806
220- 208- 3022- 0000	208-HANDWIPING – ALCOHOLS	0.0711	0.0734
220- 208- 3083- 0000	208-HANDWIPING – CFC'S	0.0005	0.0006
220- 208- 3176- 0000	208-HANDWIPING – GLYCOL ETHERS	0.0152	0.0156
220- 208- 3204- 0000	208-HANDWIPING – KETONES	0.0538	0.0556
220- 208- 3246- 0000	208-HANDWIPING – METHYLENE CHLORIDE	0.0000	0.0000

EIC Category	Description	VOC Inventory for Control Measure (tpd)	
		2024	2032
220- 208- 3339- 0000	208-HANDWIPING – TOLUENE/XYLENE	0.0140	0.0144
220- 208- 3344- 0000	208-HANDWIPING – 1,1,1, TRICHLOROEHTANE	0.0000	0.0000
220- 208- 8104- 0000	208-HANDWIPING – PURE UNSPECIFIED	0.0108	0.0112
220- 208- 8106- 0000	208-HANDWIPING – DEGREASING SOLVENTS – BLENDS	0.0335	0.0350
230- 240- 8300- 0000	240-THINNING AND CLEANUP SOLVENT USES – THINNING & CLEANUP SOLVENTS – COATINGS UNSPECIFIED	0.0144	0.0294
240- 995- 8000- 0000	995-OTHER – SOLVENTS (UNSPECIFIED)	0.1450	0.1304
520- 522- 8310- 0000	522-THINNING AND CLEANUP SOLVENTS – ADDITIVES	0.0047	0.0055
520- 522- 8350- 0000	522-THINNING AND CLEANUP SOLVENTS – CLEANUP SOLVENTS (UNSPECIFIED	0.1259	0.1439
	Total	0.997	1.0501

Emission Reductions

Lowering the VOC emission limit from 50 g/l to 25 g/l in both Rule 216 and 240 consistent with the other local air district's rules will produce an approximate 50% reduction in VOC's for the EIC categories listed below.

EIC Category	Description	VOC/ROG Emission Reductions for Control Measure (tpd)	
		2024	2032
220- 204- 0500- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – PETROLEUM NAPTHA	0.1056	0.1129
220- 204- 3008- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – ACETONE	0.0020	0.0000
220- 204- 3022- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) ALCOHOLS	0.0135	0.0140
220- 204- 3083- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – CFC'S	0.0018	0.0018
220- 204- 3176- 0000	COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – GLYCOL ETHERS	0.0012	0.0012
220- 204- 3204- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – KETONES	0.0002	0.0002
220- 204- 3246- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) METHYLENE DICHLORIDE	0.0000	0.0000
220- 204- 3333- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TERPENES	0.0060	0.0062
220- 204- 3339- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TOLUENE/XYLENE	0.0005	0.0005
220- 204- 3344- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – TCA	0.0000	0.0000
220- 204- 8106- 0000	204-COLD CLEANING (BATCH, CONVEYOR, SPRAY GUN) – BLENDS	0.0412	0.0440
220- 206- 3083- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – CFC'S	0.0019	0.0007

EIC Category	Description	VOC/ROG Emission Reductions for Control Measure (tpd)	
		2024	2032
220- 206- 3107- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – DICHLOROFLUOROETHANE	0.0002	0.0001
220- 206- 3301- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – PERFLUOROCARBONS	0.0006	0.0000
220- 206- 3344- 0000	206-VAPOR DEGREASING (BATCH, CONVEYOR) – TRICHLOROETHANE	0.0000	0.0000
220- 208- 0500- 0000	208-HANDWIPING – PETROLEUM NAPTHA	0.0000	0.0323
220- 208- 3022- 0000	208-HANDWIPING – ALCOHOLS	0.0000	0.0294
220- 208- 3083- 0000	208-HANDWIPING – CFC'S	0.0000	0.0002
220- 208- 3176- 0000	208-HANDWIPING – GLYCOL ETHERS	0.0000	0.0063
220- 208- 3204- 0000	208-HANDWIPING – KETONES	0.0000	0.0222
220- 208- 3246- 0000	208-HANDWIPING – METHYLENE CHLORIDE	0.0000	0.0000
220- 208- 3339- 0000	208-HANDWIPING – TOLUENE/XYLENE	0.0000	0.0058
220- 208- 3344- 0000	208-HANDWIPING – 1,1,1, TRICHLOROEHTANE	0.0000	0.0000
220- 208- 8104- 0000	208-HANDWIPING – PURE UNSPECIFIED	0.0000	0.0045
220- 208- 8106- 0000	208-HANDWIPING – DEGREASING SOLVENTS – BLENDS	0.0134	0.0140
230- 240- 8300- 0000	240-THINNING AND CLEANUP SOLVENT USES – THINNING & CLEANUP SOLVENTS – COATINGS UNSPECIFIED	0.0058	0.0118
240- 995- 8000- 0000	995-OTHER – SOLVENTS (UNSPECIFIED)	0.0580	0.0522
520- 522- 8310- 0000	522-THINNING AND CLEANUP SOLVENTS – ADDITIVES	0.0000	0.0022
520- 522- 8350- 0000	522-THINNING AND CLEANUP SOLVENTS – CLEANUP SOLVENTS (UNSPECIFIED	0.0504	0.0576
	Total	0.3022	0.4200

Feasibility

The contingency measure is technically feasible and cost-effective. Manufacturers are currently required to meet the solvent coating limit proposed in this control measure for several other major air districts within the State. Given that such solvents are already available in the market, the cost-effectiveness associated with this control measure is assumed $0/ton.

California Smog Check Contingency Measure (Adopted by CARB)

On October 26, 2023, CARB adopted the California Smog Check Contingency Measure State Implementation Plan Revision and transmitted it to EPA on November 13, 2023. The California Smog Check Contingency Measure SIP Revision addresses SIP contingency measure requirements of the federal CAA for certain areas designated as nonattainment of the NAAQS within the State, including the SFNA.

Several exemptions are provided by the California Smog Check program. In 2017, the California Health and Safety code was amended to exempt vehicles up to eight model years old rather than

six model years old. To reduce emissions, California will eliminate this exemption in areas of the state that are nonattainment, including the SFNA, when triggered as a contingency measure.

The contingency measure is technically feasible and cost-effective and has already been adopted by CARB.

APPENDIX B
INFEASIBILITY OF NOX CONTINGENCY MEASURES

Based on EPA's Draft Contingency Measure Guidance, there are no achievable NOx reductions from feasible local contingency measures in the SFNA to meet the OYW of Progress for NOx. A small amount of NOx contingency measure reductions will come from the CARB Smog Check Program but the SFNA air districts have not identified any specific NOx measures. This is due to the requirement that contingency measure reductions must be realized within two years of the triggering event, already committed measure by the state, and/or cost effectiveness. Cost effectiveness for the analyzed measures were calculated to 2031 dollars.

The following SFNA source categories, which were derived from more than 1% of the SFNA emission inventory categories, were evaluated to determine if there were feasible contingency measures:

- Asphaltic Concrete
- Boilers
- Biomass Boilers
- Flares
- Furnaces (Residential)
- Internal Combustion Engines
- Miscellaneous Combustion
- Water Heaters (Residential)
- Turbines

Asphaltic Concrete

Asphaltic concrete, or hot-mix pavement material, is produced in both continuous and batch plants; some of the latter are portable. The process involves heating aggregate in a rotary dryer to approximately 300 °F and mixing it with melted asphalt cement refined from petroleum. This measure targets NOx emissions from the burners used to heat the dryer.

Relevant Emission Inventory

The emissions inventory associated with asphaltic concrete operations is shown in the table below:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
EDCAQMD	None	N/A	N/A	N/A
FRAQMD	None	N/A	N/A	N/A
PCAPCD	430-424-7006-0000	Asphaltic Concrete Production	0.076	0.065
SMAQMD	430-424-7006-0000	Asphaltic Concrete Production	0.061	0.035
YSAQMD	430-424-7006-0000	Asphaltic Concrete Production	0.093	0.079

Potential controls

SCAQMD Rule 1147, SJVUAPCD Rule 4309 and Ventura County Air Pollution Control District (VCAPCD) Rule 74.34, require asphalt manufacturing operations meet 40 ppm NOx @ 3% O_2. In 2021, SCAQMD adopted Rule 1147.1, NOx Reductions from Aggregate Dryers, that requires asphaltic concrete dryers to meet 30 ppm NOx @ 3% O_2. The more stringent limits in SCAQMD Rule 1147.1 allowed sources that were meeting the current Rule 1147 emissions limits of 40 ppm NOx to continue using their existing burners until the burner is 32 years of age or January 1, 2023, whichever is later.

To meet the lower NOx limits for this source category, the equipment must be replaced or retrofitted with cleaner technology equipment.

PCAPCD Analysis

PCAPCD does not have an applicable control rule for this industrial process. Currently, only one facility is permitted in Placer County. The permit requires the NOx emission concentration from facility's aggregate drum dryer to meet 36 ppmvd @ 3% O_2. This permit requirement is lower than the other existing asphaltic concrete production rule with 40 ppmvd @ 3% O_2. SCAQMD estimated a cost-effectiveness of $46,000 per ton of NOx for units to meet 30 ppmvd @ 3% O_2, which is not cost effective in Placer County.

SMAQMD Analysis

Rule 419 was amended in 2018 requiring asphalt manufacturing operations to meet the 40 ppm NOx emissions limit. To amend Rule 419 and lower the limits from 40 ppm to 30 ppm NOx would, under a similar compliance schedule as SCAQMD Rule 1147.1,would possibly have until 2050 to continue to use upgraded burners. The five asphalt plant burners in Sacramento have initial

operation years of 2012, 2015, 2020, 2021, and 2021. All these units are currently meeting at least 40 ppm NOx. Assuming these burners are allowed to operate for 32 years from installation, this measure would not result in any contingency measure reductions for the 2015 NAAQS timeline of 2032.

In addition to the infeasible timelines for equipment turnover within the contingency measure two-year period, SCAQMD estimated a cost-effectiveness of $46,000/ton of NOx reduced for units already meeting 40 ppm to comply with 30 ppm[20]. These costs are more expensive than current SMAQMD's thresholds and are cost-prohibitive for adoption in Sacramento County.

YSAQMD Analysis

The permits for the applicable sources operating in the YSAQMD were reviewed. Currently, each of the permits has NOx limits of 0.012 lb/MMBtu for the dryers used in the production process, which is equivalent to 100 ppm @ 3% O2. A rule like SCAQMD Rule 1147 or SJVUAPCD Rule 4309 would require these sources to meet lower NOx limits of 40 ppm at 3% O2.

YSAQMD estimated a cost-effectiveness of ~$33,000/ton of NOx reduced for units to meet 30 ppm. These costs are more expensive than current YSAQMD thresholds and is cost prohibitive for adoption.

Reasons for infeasibility

Generally, operation of these types of equipment requires an air district permit. To comply with the lower NOx limits, a permitted source would need time to perform engineering/design evaluation for the replacement or retrofitted equipment, apply for and obtain pre-construction permit, purchase and obtain the equipment or retrofit from a manufacturer or distributor, complete the installation or retrofit, perform source test of new or retrofitted equipment, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible. In addition, the costs for this source category, as discussed above, are cost prohibitive for adoption in the SFNA.

Boilers – 1 mmBtu/hr or greater

Boilers and process heaters are used to provide hot water and steam for a variety of industrial and commercial applications, including space heating, food processing, garment laundering, and equipment sterilization. Manufacturing operations use process heaters to heat materials or equipment during the manufacturing process. The equipment burners can be fired on solid, liquid, or gaseous fuels. NOx emissions are generated from the combustion of the fuel.

SFNA Emissions Inventories

EDCAQMD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)

[20] SCAQMD. *Final Staff Report Proposed Rule 1147.1 – NOx Reductions from Aggregate Dryers.* August 2021. p. 4-2.

			2024	**2032**
EDCAQMD	060-995-0110-0000	Service and Commercial – Other– Natural Gas	0.012	0.017

FRAQMD Inventory:

District	**EIC**	**Category**	**NOx Inventory for source categories (tpd)**	
			2024	**2032**
FRAQMD	060-995-0110-0000	Service and Commercial – Other– Natural Gas	0.001	0.002

PCAPCD Inventory:

District	**EIC**	**Category**	**NOx Inventory for source categories (tpd)**	
			2024	**2032**
PCAPCD	050- 005- 0110- 0000	Manufacturing and Industrial – Boilers – Natural gas	0.009	0.018
PCAPCD	050- 005- 0124- 0000	Manufacturing and Industrial – Boilers – Propane	0	N/A
PCAPCD	050- 010- 0110- 0000	Manufacturing and Industrial – Process Heaters – Natural gas	0.006	0.007
PCAPCD	060- 005- 0110- 0000	Service and Commercial – Boilers – Natural gas	0.021	0.051
PCAPCD	060- 005- 0124- 0000	Service and Commercial-Boilers – Propane	0.002	0.006
PCAPCD	060- 005- 0218- 0000	Service and Commercial-Boilers – Lignite	0	0
		Total	0.039	0.084

SMAQMD Inventory:

District	**EIC**	**Category**	**NOx Inventory for source categories (tpd)**	
			2024	2032
SMAQMD	030-010-0100-0000	Oil and Natural Gas Production – Process Heaters – Gaseous Fuel	0	0

SMAQMD	050-005-0110-0000	Manufacturing and Industrial – Boilers – Natural gas	0.020	0.022
SMAQMD	050-005-0124-0000	Manufacturing and Industrial – Boilers – Propane	0.004	0.004
SMAQMD	050-005-1220-0000	Manufacturing and Industrial – Boilers – Distillate Oil	0.002	0
SMAQMD	050-010-0110-0000	Manufacturing and Industrial – Process Heaters – Natural gas	0.005	0.010
SMAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.034	N/A
SMAQMD	050-995-0120-0000	Manufacturing and Industrial – Other – LPG	0.033	0.033
SMAQMD	050-995-0200-0000	Manufacturing and Industrial – Other – Solid Fuel (Unspecified)	0.001	0
SMAQMD	050-995-1000-0000	Manufacturing and Industrial – Other – Liquid Fuel (Unspecified)	0	0.001
SMAQMD	050-995-1500-0000	Manufacturing and Industrial – Other – Residual Oil	0	0
SMAQMD	052-005-0110-0000	Food and Agricultural Processing – Boilers – Natural Gas	0.009	0.017
SMAQMD	052-010-0110-0000	Food and Agricultural Processing – Process Heaters – Natural Gas	0.003	0.004
SMAQMD	060-005-0110-0000	Service and Commercial – Boilers – Natural gas	0.005	0.002
SMAQMD	060-005-0144-0000	Service and Commercial – Boilers – Sewage Gas	0.002	0.001
SMAQMD	060-005-1220-0000	Service and Commercial – Boilers – Distillate Oil	0	0
SMAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.240	0.218
SMAQMD	060-995-0110-0005	Service and Commercial – Other – Natural Gas < 1 mmbtu/hr	0.125	0.079
SMAQMD	060-995-0120-0000	Service and Commercial – Other – LPG	0.039	0.054
SMAQMD	060-995-1220-0000	Service and Commercial – Other – Distillate Oil	0.001	0
		Totals	0.523	0.445

YSAQMD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
YSAQMD	010-005-0110-0000	Electric Utilities – Boilers – Natural Gas	0	0
YSAQMD	030-010-0100-0000	Oil and Natural Gas Production – Process Heaters – Gaseous Fuel	0	0
YSAQMD	050-005-0110-0000	Manufacturing and Industrial – Boilers – Natural gas	0.011	0.015
YSAQMD	050-005-0243-0000	Manufacturing and Industrial – Boilers – Refuse Derived Fuel	0	0
YSAQMD	050-010-0110-0000	Manufacturing and Industrial – Boilers – Natural gas	0.014	0.013
YSAQMD	050-010-0120-0000	Manufacturing and Industrial – Process Heaters – Liquid Petroleum Gas	0.013	0.001
YSAQMD	050-010-0130-0000	Manufacturing and Industrial – Process Heaters – Process Gas	0	0
YSAQMD	050-010-1224-0000	Manufacturing and Industrial – Process Heaters – Distillate Oil #2	0	N/A
YSAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.443	0.469
YSAQMD	050-995-1220-0000	Manufacturing and Industrial – Other – Distillate Oil		0.001
YSAQMD	052-005-0110-0000	Food and Agricultural Processing – Boilers – Natural Gas	0.103	0.106
YSAQMD	052-010-0110-0000	Food and Agricultural Processing – Process Heaters – Natural Gas	0.020	0.017
YSAQMD	052-010-0120-0000	Food and Agricultural Processing – Process Heaters – Liquefied Petroleum Gas	0.004	0.004
YSAQMD	052-010-1224-0000	Food and agricultural Processing – Process Heaters – Distillate Oil #2	0	0
YSAQMD	060-005-0110-0000	Service and Commercial – Boilers – Natural gas	0.092	0.070
YSAQMD	060-005-0124-0000	Service and Commercial – Boilers – Propane	0	N/A
YSAQMD	060-010-0110-0000	Service and Commercial – Process Heaters – Natural Gas	0.005	0.003
YSAQMD	060-010-0130-0000	Service and Commercial – Process Heaters – Process Gas	0	N/A
YSAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.835	0.813

YSAQMD	060-995-0120-0000	Service and Commercial – Other – LPG	0	N/A
YSAQMD	060-995-1220-0000	Service and Commercial – Other – Distillate Oil	0.001	0.001
		Totals	1.541	1.513

Potential controls

The table below compares NOx emission limits in SCAQMD Rules 1146.1 and 1146 and SJVUAPCD Rules 4306 and 4320 to SFNA rules. Emissions of NOx can be reduced using combustion controls, which modify the combustion characteristics, or using post-combustion controls, such as nonselective catalytic reduction (NSCR) and selective catalytic reduction (SCR). The most stringent limits are shown in bold.

SFNA Boiler Rule Comparison Chart

Unit Rating, mmBtu/hr	EDCAQMD Rule 229	FRAQMD Rule 3.21	PCAPCD Rules 231/247	SMAQMD Rule 411	YSAQMD Rules 2.27/2.45	NOx Emission Limit, ppmvd @ 3% O_2			
						SCAQMD Rule 1146.1	SCAQMD Rule 1146	SJVUAPCD Rule 4306	SJVUAPCD Rule 4320 (enhanced)
>2 to <5	Not permitted	20	20	30	30	**7** ppm (firetube); otherwise **9** (12 for atmospheric)	N/A	N/A	N/A
5 to 20	30	30	30	15	15	N/A	7 ppm (firetube); otherwise 9 ppm	7 ppm (firetube) otherwise 9 ppm	**5** ppm (firetube); otherwise 5 except for Schools, digester gas, thermal fluid heaters (9 ppmv)
>20 to 75	30	30	30	9	9	N/A	If >12 ppm today: **5 ppm with SCR** ≤ 12 ppm: 7 ppm (firetube); otherwise 9	7 ppm	**2.5** ppm Oilfield steam generators, Refinery units, process heaters, low usage: 5 ppm
>75 to 110	30	30	30	9	9	N/A	**5**	5	**2.5**
>110	N/A	30	30	9	9	N/A	5	5	**2.5**

Lower NOx limits for some boilers are feasible as shown in SCAQMD and SJVUAPCD, however the specific use cases and the total amount of reductions achieved are based on the pre-amendment emission limits. Specifically, each district within the SFNA has specific scenarios to determine the feasibility of rule amendments, and the scenarios for each district are discussed below.

SMAQMD Analysis

Using source-specific data and based on cost information in the SJVUAPCD staff report for Rules 4306 and 4320 and the SCAQMD staff reports for Rules 1146 and 1146.1, the cost effectiveness of each SMAQMD boiler category is discussed below in ton of NOx reduced

- For boilers > 75 mmBtu/hr, the actual usage for these boilers are about 10% of capacity, making a cost-effectiveness for this category cost prohibitive at over ~$270,000 per ton of NOx reduced.
- For boilers from > 20 mmBtu/hr to less than 75 mmBtu/hr, the cost-effectiveness of the SJVUAPCD limit of 2.5 ppm is approximately $58,195 per ton of NOx reduced. At a higher limit of 7 ppm, the cost-effectiveness is prohibitive at ~$274,444 per ton of NOx reduced.
- For boilers from > 5 mmBtu/hr to less than 20 mmBtu/hr, the cost-effectiveness of the SJVUAPCD limit of 5 ppm is approximately $115,438 per ton of NOx reduced. At a higher limit of 7 ppm, the cost-effectiveness is prohibitive at ~$184,066 per ton of NOx reduced.
- For boilers from > 2 mmBtu/hr to less than 5 mmBtu/hr, the cost effectives of the SCAQMD limit of 9 ppm is approximately $61,627 per ton of NOx reduced and will be considered within the range of cost-effectiveness for this analysis.

For each size range in SMAQMD, the overall cost effectiveness of a boiler rule is cost-prohibitive and infeasible.

EDCAQMD Analysis

There is only one source (with two boilers) in El Dorado County in the nonattainment area to which the >5 mmBtu/hr portion of the rule would apply, and a new replacement boiler (as the existing boilers cannot be retrofitted to meet the standard) is several thousand dollars, and the maximum reduction would be 0.0104 tpd. Additionally, using the cost information in the SJVUAPCD staff report for Rules 4306 and 4320 and the SCAQMD staff reports for Rules 1146 and 1146.1, the overall cost-effectiveness of is $103,234 per ton of NOx reduced. The proposed measure is not cost-effective.

FRAQMD Analysis

There are three boilers in the south Sutter County portion of the SFNA above 1 million BTU/hr. The boilers are rated at 1.01 million BTU/hr, 1.2 million BTU/hr, and 1.5 million BTU/hr. None of the boilers would be subject to the SCAQMD Rules 1146.1 and 1146 or SJVUPACD Rules 4306 and 4320 because those limits are effective at 2 million BTU/hr and above. There would be no emission reductions from the adoption of the control measure.

PCAPCD Analysis

PCAPCD Rule 231 sets a NOx limit at 30 ppm for units that are 5 million Btu and greater, and Rule 247 sets a NOx limit at 20 ppm for boilers and heaters with a heat rating from 75,000 Btu to less than 5 million Btu. Since natural gas boilers and heaters from 75,000 Btu to 2 million Btu already meet the SCAQMD requirement, and since there are no boilers or heaters in the district's inventory which exceed 20 million Btu, emission reductions can only be claimed from units ranging from greater than 2 million to 20 million Btu. The cost effectiveness for implementing this control

measure is based on cost information in the SJVUAPCD staff report for Rule 4320 and the SCAQMD staff reports for Rules 1146 and 1146.1. The cost effective for this control measure is $134,640 per ton of NOx reduced. Adoption of more stringent limits would not be cost effective in Placer County.

YSAQMD Analysis

Rule 2.27 was last revised in 2019, with requirements for boilers with rated heat input greater than 20 million British thermal units per hour (MMBtu/hr) to limit NOx concentrations to 9 volumetric parts per million (ppmv) at 3 % oxygen (O_2) and for boilers with rated heat input greater than or equal to 5 MMBtu/hr up to 20 MMBtu/hr to limit NOx concentrations to 15 ppmv @ 3% O_2. Rule 2.27 requires implementation of these emission reductions by December 31, 2023. Annualized costs over 25 years for boilers 20 million Btu/hour or greater to retrofit to achieve a 9 ppmv NOx emissions limit at 3% O_2 were calculated to be between $33,336 and $247,492. Annualized costs over 10 years for boilers 5 million Btu/hour or greater to retrofit to achieve a 15 ppmv NOx emissions limit at 3% O_2 were calculated to be between $11,849 and $97,913. At the time of the amendment to Rule 2.27, the Staff Report concluded that any additional emission reductions would not be cost effective, and would, therefore, not be cost effective as RACM as these costs would be incrementally additive to the costs already incurred.

Reasons for infeasibility

Generally, operation of these types of equipment requires an air district permit. To comply with the lower NOx limits, a permitted source would need time to perform engineering/design evaluation for the replacement or retrofitted equipment, apply for and obtain pre-construction permit, purchase and obtain the equipment or retrofit from a manufacturer or distributor, complete the installation or retrofit, perform source test of new or retrofitted equipment, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible. In addition, the costs for this source category, as discussed above, are cost prohibitive for adoption in the SFNA.

Boilers – Biomass

Biomass boilers are very similar to conventional boilers to provide hot water and steam for a variety of industrial and commercial applications. Different than the conventional boilers, biomass boilers work by burning organic materials (not from fossil fuels), such as agricultural crop residues, barks, lawn, yard and garden chippings, leaves, tree and brush pruning, logs, and wood chips. NOx emissions are generated from the combustion of biomass materials. In the SFNA, the only biomass boilers are located in Placer and Yolo Counties.

Relevant Emission Inventory

The emissions inventory associated with biomass boilers is shown in the table below:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
PCAPCD	010-005-0254-0000	Electric Utilities – Boilers – Wood/Bark Waste	0.779	0.614

YSAQMD	010-005-0254-0000	Electric Utilities – Boilers – Wood/Bark Waste	0.347	0.267

Potential controls

PCAPCD Rule 233 regulates the NOx emissions generated from biomass boilers that have a heat input less than 500 million Btu per hour. NOx emissions from biomass boilers are measured by a continuous emission monitoring system (CEMS) installed in the stack. Currently, PCAPCD Rule 233 limits NO_x emission to 115 ppmv corrected to 12% CO_2 for any 3-hour rolling average and 68 ppmv corrected to 12% CO_2 for a 24-hour block average. PCAPCD Rule 233 limit of 68 ppm at 12% is approximately equal to 90 ppm corrected to 3% O_2 on a 24-hour block average[21]. This is consistent with YSAQMD Rule 2.43 limit that limits NOx emissions to 90 ppm @ 3% O2 on a 24-hour rolling average from biomass boilers. YSAQMD's rule applies to any biomass boiler that has a heat input of more than 5 million Btu per hour.

PCAPCD Analysis

No other more stringent controls were identified.

YSAQMD Analysis

. No other more stringent controls were identified.

Reasons for infeasibility

No other more stringent controls were identified.

Flares

Flares are used to reduce VOC emissions by incineration. In some applications, they are used for continuous control, and in other instances, may be used as safety devices during emergency situations. The combustion process produces NOx, which is emitted as a secondary pollutant.

Relevant Emission Inventory

The emissions inventory associated with flares is shown in the table below:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
EDCAQMD	120-132-0136-0000	Flares – Waste Gas	0.006	0
FRAQMD	None	N/A	N/A	N/A
PCAPCD	120-132-0136-0000	Flares – Waste Gas	0.010	0.010
SMAQMD	120-132-0136-0000	Flares – Waste Gas	0.025	0.033
SMAQMD	130-132-0136-0000	Flares – Waste Gas	0.003	0.003
YSAQMD	110-132-0146-0000	Flares – Digester Gas	0.002	0.011
YSAQMD	130-132-0136-0000	Flares – Waste Gas	0	0

No districts within the SFNA have a rule covering this source category.

[21] *Technical Support Document for EPA's Notice of Rulemaking for the California State Implementation Plan. Placer County Air Pollution Control District's Rule 233, Biomass Boilers.* United States Environmental Protection Agency, Region 9. July 2011.

Potential controls

The controls identified for flares are based on SJVAPCD Rule 4311. SJVAPCD Rule 4311 controls emissions from flares by requiring flare minimization plans, extensive monitoring and record keeping, and submitting reports of planned and unplanned activities. In the December 2020 rule amendments, SJVAPCD further limit emission from flares by:

1. Removing the exemption for flares located at stationary sources with potentials to emit of less than 10 tons per year of VOC and less than 10 tons per year of NOx;
2. Curtailing the exemption for flares operated at municipal solid waste landfills for flares that combust less than 2000 MMscf of landfill gas per calendar year and that have ceased accepting waste; and
3. Adding performance standards that require Ultra Low NOx flaring technologies for operators of flares exceeding annual capacity through thresholds.

Reasons for infeasibility

The reduction in flaring operations has been shown to be feasible in SJVUAPCD by driving sources to reduce flaring operations. The removal of the exemptions in SJVAPCD's December 2020 would make similar sources in the SFNA be subject to the requirements in SJVAPCD Rule 4311. SJVUAPCD estimated the cost effectiveness of its rule amendments to be approximately $100,000 per ton of NOx removed. The cost effectiveness is estimated to be similar in the SFNA. Due to the high cost-effectiveness, this measure is not considered feasible in the SFNA.

In addition, it is infeasible for reductions to occur within the contingency measure 2-year period. In SJVUAPCD 2020 amendments to their flare rule, the rule allowed sources up to three years to meet the emission limits. Sources that were able to limit annual throughput to levels below newly specified thresholds were given 1.5 years to meet these requirements but this action did result in reductions because these facilities were likely already operating below the threshold.

Operation of flares requires an air district permit. To comply with the emission limits and similar requirements in SJVUAPCD's rule, a permitted source would need time to perform engineering/design evaluation for the control technology, apply for and obtain pre-construction permit, purchase and obtain the control technology from a manufacturer or distributor, complete the installation or retrofit, perform source test, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible.

Furnaces (Residential)

Residential heating accounts for a large fraction of residential energy consumption. The majority of residential furnaces use natural gas as fuel, which produces NOx during the combustion process.

Relevant Emission Inventory

The emissions inventory associated with residential furnaces is shown in the table below:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
EDCAQMD	610-606-0110-0000	Residential Fuel Combustion – Natural Gas Space Heating	0.004	0.039
EDCAQMD	610-606-1220-0000	Residential Fuel Combustion – Distillate Oil Space Heating	0.003	0.003
FRAQMD	610-606-0110-0000	Residential Fuel Combustion – Natural Gas Space Heating	0.001	0.001
FRAQMD	610-606-1220-0000	Residential Fuel Combustion – Distillate Oil Space Heating	0	0
PCAPCD	610-606-0110-0000	Residential Fuel Combustion – Natural Gas Space Heating	0.055	0.129
PCAPCD	610-606-1220-0000	Residential Fuel Combustion – Distillate Oil Space Heating	0.004	0.003
SMAQMD	610-606-0110-0000	Residential Fuel Combustion – Natural Gas Space Heating	0.394	0.384
SMAQMD	610-606-1220-0000	Residential Fuel Combustion – Distillate Oil Space Heating	0.001	0.001
YSAQMD	610-606-0110-0000	Residential Fuel Combustion – Natural Gas Space Heating	0.084	0.073
YSAQMD	610-606-1220-0000	Residential Fuel Combustion – Distillate Oil Space Heating	0	0

Potential controls

Several California districts regulate these units at “point of sale.” That is, only units certified to meet the district’s NOx standard may be sold or installed. SJVUAPCD and SCAQMD both require a NOx standard of 14 ng of NOx per Joule of heat output that began to phase in starting in 2015. Recent amendments to SCAQMD and SJVUAPCD rules allowed for additional compliance time; however, as of 2023, these district rules do not provide additional compliance time to meet 14 ng/J.

The lower end of thermal efficiencies for new units is approximately 80%. On the basis of heat output, pre-control units are estimated to emit 49.5 ng of NOx per Joule of heat output. Therefore, after all older units are eventually replaced with new units that meet the 14 ng/J standard, a NOx emission reduction of 72% may be expected. Units have been shown to be cost-effective and in use in many other air districts, including the most stringent limits in SCAQMD and SJVUAPCD.

In 2023, BAAQMD adopted rules requiring zero emissions for furnaces manufactured after January 1, 2029.

In the 2022 State SIP Strategy, CARB committed to develop and adopt by 2025 a zero-emission standard for space heaters, which includes furnaces, in California starting in 2030. On May 29, 2024, CARB held a public workshop to discuss proposed zero-emissions space and water heater standards[22].

No districts within the SFNA have a rule covering this source category.

Reasons for infeasibility

A residential furnace is assumed to have a lifetime of 20 years. Each year, then, 5% of the units are expected to be replaced. However, due to the time required for turnover of existing units, a rule would not be feasible as a contingency measure. Per EPA guidance, contingency measures should be measures that would result in the projected emission reductions within a year of the triggering event or within two years with proper justification. A new rule covering devices not currently subject to District rules and regulations would most likely require a two-year phase in to inform the public and allow manufacturers and distributors to prepare the marketplace with lower emission devices. In addition, the units manufactured prior to the effective date of rule amendments would be allowed to be sold thereby reducing any potential reductions in the first two years. This conclusion is consistent with EPA's conclusion for SJVUAPCD FIP that no meaningful reductions would occur within the two-year timeframe needed for contingency measures[23]. In addition to the timeline constraints, any CARB adopted standards that would achieve emission reductions for this category would preclude any district rules for contingency measure reductions.

Internal Combustion Engines

Internal combustion (IC) engines are used in a wide variety of applications, including electrical power generation, liquid pumping, gas compression, mobile equipment, and vehicles. NOx is generated in IC engines from both the oxidation of nitrogen in the air (thermal NOx) and from the oxidation of fuel-bound nitrogen (fuel NOx).

SFNA Emissions Inventories

The emissions inventory associated with IC engines is shown in the table below:

EDCAQMD Inventory

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032

[22] California Air Resources Board. Zero-Emission Space and Water Heater Standards. https://ww2.arb.ca.gov/our-work/programs/building-decarbonization/zero-emission-space-and-water-heater-standards/meetings-workshops
[23] Ibid. p. 50.

EDCAQMD	050-040-1200-0000	Manufacturing and Industrial, IC Reciprocating Engines – Diesel/Distillate Oil	0.022	0.020
EDCAQMD	052-042-1200-0010	Food and Agricultural Processing, Irrigation IC Engines – Natural Gas	0.003	0.002
EDCAQMD	052-042-1200-0011	Food and Agricultural Processing, Irrigation IC Engines, Stationary – Diesel/Distillate Oil	0.003	0.002
EDCAQMD	099-040-1200-0000	Other Fuel Compression, Compressors, Rich-Burn – Natural Gas	0.038	0.010
		Totals	0.066	0.034

FRAQMD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
FRAQMD	030-304-0110-0000	Oil and Natural Gas Production, I.C. Reciprocating Engines, Natural Gas	0.004	0.001
FRAQMD	099-040-1200-0000	Other (Fuel Combustion) I.C. Reciprocating Engines, Diesel/Distillate Oil (Unspecified)	0.001	0
		Totals	0.005	0.001

PCAPCD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
PCAPCD	050-040-0012-0000	Manufacturing and Industrial, IC Reciprocating Engines – Unspecified Fuel	0	0
PCAPCD	050-040-0110-0000	Manufacturing and Industrial, IC Reciprocating Engines – Natural Gas	0	0
PCAPCD	050-040-0124-0000	Manufacturing and Industrial, IC Reciprocating Engines – Propane	0	0
PCAPCD	050-040-1100-0000	Manufacturing and Industrial, IC Reciprocating Engines – Gasoline	0.003	N/A
PCAPCD	050-040-1200-0000	Manufacturing and Industrial, IC Reciprocating Engines – Diesel/Distillate Oil	0.014	0.010

PCAPCD	052-040-0124-0000	Food & Ag, IC Reciprocating Engines – Propane	0	0
PCAPCD	060-040-0110-0000	Service and Commercial, IC Reciprocating Engines – Landfill Gas	0	0
PCAPCD	060-040-0124-0000	Service and Commercial, IC Reciprocating Engines – Propane	0.001	0.001
PCAPCD	060-040-0142-0000	Service & Commercial, IC Engines – Landfill Gas	0.019	N/A
PCAPCD	060-040-1200-0000	Service and Commercial, Compressors, Lean-Burn – Natural Gas	0.007	
PCAPCD	099-040-1200-0000	Other Fuel Compression, Compressors, Rich-Burn – Natural Gas	0.091	
		Totals	0.141	0.011

SMAQMD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
SMAQMD	010-040-0142-0000	Electric Utilities, IC Engines – Landfill Gas	0.221	0.183
SMAQMD	030-307-0110-0000	Oil and Natural Gas Production, Compressors, Lean-Burn – Natural Gas	0.001	0
SMAQMD	030-309-0110-0000	Oil and Natural Gas Production, Compressors, Rich-Burn – Natural Gas	0.003	0.002
SMAQMD	050-040-0012-0000	Manufacturing and Industrial, IC Reciprocating Engines – Unspecified Fuel	0.041	0.002
SMAQMD	050-040-0110-0000	Manufacturing and Industrial, IC Reciprocating Engines – Natural Gas	0.161	0.014
SMAQMD	050-040-0120-0000	Manufacturing and Industrial, IC Reciprocating Engines – LPG	0	0
SMAQMD	050-040-0124-0000	Manufacturing and Industrial, IC Reciprocating Engines – Propane	0	0.003
SMAQMD	050-040-1200-0000	Manufacturing and Industrial, IC Reciprocating Engines – Diesel/Distillate Oil	0.009	0.015
SMAQMD	052-042-0110-0000	Food and Agricultural Processing, Irrigation IC Engines – Natural Gas	0.055	0.069
SMAQMD	052-042-1200-0010	Food and Agricultural Processing, Irrigation IC	0.040	0.057

		Engines, Stationary – Diesel/Distillate Oil		
SMAQMD	060-040-1200-0000	Service and Commercial, IC Reciprocating Engines – Diesel/Distillate Oil	0.006	0.035
SMAQMD	099-040-1200-0000	Other Fuel Combustion, IC Reciprocating Engines – Diesel/Distillate Oil	0.354	0.191
		Totals	0.891	0.571

YSAQMD Inventory:

District	EIC	Category	NOx Inventory for source categories (tpd)	
			2024	2032
YSAQMD	010-040-0110-0000	Electric Utilities – I.C. Reciprocating Engines – Natural Gas	0.001	0.001
YSAQMD	010-040-0142-0000	Electric Utilities, IC Engines – Landfill Gas	0.041	0.071
YSAQMD	010-040-1200-0000	Electric Utilities, IC Engines – Diesel/Distillate Oil	0.007	0.003
YSAQMD	030-040-0110-0000	Oil and Gas Production – IC Engines – Natural Gas	0.022	0.008
YSAQMD	030-040-1200-0000	Oil and Gas Production – IC Engines – Diesel/Distillate Oil	0.002	0.003
YSAQMD	030-307-0100-0000	Oil and Gas Production – Compressors Lean Burn – Gaseous Fuel	0.002	0.001
YSAQMD	030-307-0110-0000	Oil and Natural Gas Production, Compressors, Lean-Burn – Natural Gas	0.001	0.001
YSAQMD	030-309-0100-0000	Oil and Gas Production – Compressors, Rich Burn – Gaseous Fuel	0.012	0.009
YSAQMD	030-309-0110-0000	Oil and Natural Gas Production, Compressors, Rich-Burn – Natural Gas	0.004	0.003
YSAQMD	050-040-0110-0000	Manufacturing and Industrial, IC Reciprocating Engines – Natural Gas	0.001	0.009
YSAQMD	050-040-1200-0000	Manufacturing and Industrial, IC Reciprocating Engines – Diesel/Distillate Oil	0.003	0.016
YSAQMD	052-040-0110-0000	Food and Agricultural Processing – IC Engines – Natural Gas	0	0

YSAQMD	052-040-1200-0000	Food and Agricultural Processing – IC Engines – Diesel/Distillate Oil	0	0
YSAQMD	052-042-1200-0010	Food and Agricultural Processing, Irrigation IC Engines, Stationary – Diesel/Distillate Oil	0.207	0.168
YSAQMD	060-040-0110-0000	Service and Commercial, IC Reciprocating Engines – Landfill Gas	0.000	0.001
YSAQMD	060-040-1200-0000	Service and Commercial, Compressors, Lean-Burn – Natural Gas	0.005	0.052
YSAQMD	060-040-1412-0000	Service and Commercial – IC Engines – Keronaptha Jet Fuel	0.001	0
YSAQMD	060-045-0110-0000	Service and Commercial – IC Engines – Natural Gas	0.001	0.007
YSAQMD	060-045-1200-0000	Service and Commercial – IC Engines – Diesel/Distillate Oil	0	0
YSAQMD	099-040-1200-0000	Other Fuel Compression, Compressors, Rich-Burn – Natural Gas	0.081	0.017
		Totals	0.391	0.370

Potential controls

Emissions of NOx can be reduced using combustion controls, which modify the combustion characteristics, or using post-combustion controls, such as nonselective catalytic reduction (NSCR) and selective catalytic reduction (SCR). SCAQMD Rule 110.2, Emissions from Gaseous and Liquid-Fuel Engines, requires landfill and digester gas-fired engines to meet 11 ppm NOx @ 15% O_2.

EDCAQMD Analysis

Rule 233 would not apply to two agricultural EIC codes listed above. Of the permitted prime power engines in El Dorado County, there are 12 stationary engines (not portable) that would be subject to the SCAQMD rule. Two engines are very large cogenerators capable of using diesel or natural gas, one engine is natural gas, and the others are diesel powered. Staff performed a detailed review of these permits and determined, given the low use limits of these engines and the best available emission control devices for each respective engine, the emissions reductions would be minimal and not cost-effective.

FRAQMD Analysis

All permitted engines within FRAQMD are emergency standby engines and not subject to this analysis or any identified control strategies.

PCAPCD Rule 242 Analysis

PCAPCD Rule 242 regulates NOx emissions from stationary IC engines. Currently, 17 prime engines in the Placer County nonattainment area are subject to Rule 242; 2 are diesel-fueled, 7 are landfill gas-fueled, 7 are natural gas fueled, and 1 is propane-fueled. The combined NOx emissions from these 17 permitted prime engines are about 0.0352 tpd. Although the adoption of NOx emission limits consistent with SCAQMD Rule 110.2 would reduce NOx emissions from these 17 prime engines, this control measure is not considered cost-effective (~$71,400 per ton of NOx reduced).

SMAQMD Rule 412 Analysis

SMAQMD Rule 412 regulates only stationary IC engines rated 50 brake horsepower (bhp) that are located at major sources of NOx with exemptions provided for emergency standby. Staff performed a detailed review of the permits and source test results for all applicable IC engines within the SMAQMD jurisdiction. The engines that would generate nearly all reductions are all landfill gas-fueled engines that could be subject to 11 ppm NOx. Due to the specific conditions of the source, the pretreatment of siloxanes from the gas stream is necessary to implement an SCR system without destroying the system. The removal of the siloxanes would result in cost prohibitive controls. It is estimated, based on SCAQMD calculations, the cost of controls for these engines is $42,118 per ton of NOx reduced. The cost of controls is above the SMAQMD BACT cost effectiveness thresholds and is not cost-effective for the SMAQMD to adopt.

YSAQMD Rule 2.32 Analysis

YSAQMD Rule 2.32 applies to all stationary IC engines that are rated 50 bhp or greater with exceptions provided for emergency standby and engines operated less than 200 hours per calendar year. Staff performed a detailed review of the permits and source test results for all applicable IC engines within the YSAQMD jurisdiction. YSAQMD determined that as many as 23 engines could achieve reductions but due to the cost of controls, this measure is above the range of YSAQMD BACT cost effectiveness thresholds and is not cost-effective for YSAQMD to adopt. Similar conditions for landfill gas-fueled engines are applicable in YSAQMD. It is estimated based on SCAQMD calculations, the cost of controls for this control measure is between $57,760 and $97,354 per ton of NOx reduced.

Reasons for infeasibility

As identified, the costs of controls for this source category are cost prohibitive for adoption in the SFNA. Furthermore, the time needed to upgrade equipment within the contingency measure period to achieve reductions in the second year is infeasible.

Operation of internal combustion engines requires an air district permit. To comply with the lower NOx limits, a permitted source would need time to perform engineering/design evaluation for the replacement or retrofitted equipment, apply for and obtain pre-construction permit, purchase and obtain the equipment or retrofit from a manufacturer or distributor, complete the installation or retrofit, perform source test of new or retrofitted equipment, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible. In addition, consistent with

EPA's analysis for the SJVUAPCD Contingency Measure FIP, the installation of SCR is technologically infeasible within the two-year contingency measure timeframe[24].

Miscellaneous Combustion

Miscellaneous combustions devices are considered the devices that are not otherwise controlled by other district rules such as dryers, dehydrators, heaters, kilns, furnaces, crematories, incinerators, heated pots, cookers, roasters, heated tanks, evaporators, distillation units, afterburners, degassing units, vapor incinerators, catalytic or thermal oxidizers, and remediation units.

Within the SFNA, only SMAQMD has a rule covering this source category. SMAQMD Rule 419, NOx from Miscellaneous Combustion Units, applies to all gaseous and liquid fuel-fired miscellaneous combustion units with a total rated heat input capacity of 5 million Btu/hr or greater that are not subject to other district NOx rules, such as boilers, IC engines, turbines, or water heaters.

Relevant Emission Inventory

EDCAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
EDCAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.007	0.007
EDCAQMD	050-995-1220-0000	Manufacturing and Industrial – Other – Distillate Oil	0.005	0.006
EDCAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.012	0.009
EDCAQMD	430-995-7000-0000	Mineral Process – Other – Mineral and Metal Products	0.019	0.016
		Totals	0.043	0.038

FRAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
FRAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.014	0.015

[24] U.S. EPA. *EPA Source Category and Control Measure Assessment and Reasoned Justification Technical Support Document. Proposed Contingency Measures Federal Implementation Plan for the Fine Particulate Matter Standards for San Joaquin Valley, California.* July 2023. p. 29.

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
FRAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.001	0.003
		Totals	0.015	0.018

PCAPCD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
PCAPCD	050-012-0110-0000	Manufacturing and Industrial – Oven Heaters – Natural Gas	0.004	0.004
PCAPCD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0	0
PCAPCD	050-995-1220-0000	Manufacturing and Industrial – Other – Distillate Oil	0.012	0.015
PCAPCD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.036	0.036
PCAPCD	060-995-0120-0000	Service and Commercial – Other – LPG	N/A	0.024
PCAPCD	060-995-1220-0000	Service and Commercial – Other – Distillate Oil	0	0.025
PCAPCD	430-995-7000-0000	Mineral Process – Other – Mineral and Metal Products	0.043	0.040
PCAPCD	430-995-7012-0000	Mineral Process – Other – Bricks	0.007	0.005
PCAPCD	430-995-7020-0000	Mineral Process – Other – Ceramics	0.002	0
PCAPCD	430-995-7022-0000	Mineral Process – Other – Clay	0.004	0.003
		Totals	0.108	0.152

SMAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
SMAQMD	050-012-0110-0000	Manufacturing and Industrial – Oven Heaters – Natural Gas	0.003	0.002
SMAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.034	0.037
SMAQMD	050-995-0120-0000	Manufacturing and Industrial – Other – LPG	0.003	0.033

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
SMAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.240	0.218
SMAQMD	060-995-0110-0005	Service and Commercial – Other – Natural Gas <1mmBtu/hr	0.125	0.079
SMAQMD	060-995-1220-0000	Service and Commercial – Other – LPG	0.039	0.054
SMAQMD	060-995-1220-0000	Service and Commercial – Other – Distillate Oil	0.001	0
SMAQMD	430-995-7000-0000	Mineral Process – Other – Mineral and Metal Products	0.156	0.136
SMAQMD	430-995-7012-0000	Mineral Process – Other – Bricks	0.025	0.018
SMAQMD	430-995-7020-0000	Mineral Process – Other – Ceramics	0	0
SMAQMD	430-995-7022-0000	Mineral Process – Other – Clay	0.003	0.002
		Totals	0.629	0.579

YSAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
YSAQMD	050-012-0110-0000	Manufacturing and Industrial – Oven Heaters – Natural Gas	0	0.002
YSAQMD	050-995-0110-0000	Manufacturing and Industrial – Other – Natural Gas	0.443	0.469
YSAQMD	050-995-1220-0000	Manufacturing and Industrial – Other – Distillate Oil	0.001	0.001
YSAQMD	060-995-0110-0000	Service and Commercial – Other – Natural Gas	0.835	0.813
YSAQMD	060-995-1220-0000	Service and Commercial – Other – LPG	0	0.001
YSAQMD	060-995-1220-0000	Service and Commercial – Other – Distillate Oil	0.001	0.001
YSAQMD	430-995-7000-0000	Mineral Process – Other – Mineral and Metal Products	0	0
YSAQMD	430-995-7012-0000	Mineral Process – Other – Bricks	0	0
YSAQMD	430-995-7022-0000	Mineral Process – Other – Clay	0	0
		Totals	1.28	1.29

Potential controls

The requirements for these miscellaneous combustion sources are based on SCAQMD Rule 1147 – NOx Reductions from Miscellaneous Sources. The control measure establishes NOx emission limits that depend on the type of device and the process temperature. The NOx limits can be achieved by using low NOx burners. Compliance timelines for existing in-use equipment depend on the age of the equipment. Equipment with less than 1 lb/day of emissions would not be subject to the requirements until modification or replacement of the equipment.

SCAQMD amended Rule 1147 in 2022 that requires some units to meet lower limits than previously required. However, units that were already complying with the rule have up to 32 years of burner use.

EDCAQMD Analysis

Infeasible due potential costs (approximately $34,750 per ton of NOx reduced), and timeline concerns to design, permit, and install new equipment.

FRAQMD Analysis

Infeasible due to costs, (approximately $34,750 per ton of NOx reduced), and timeline concerns to design, permit, and install new equipment.

PCAPCD Analysis

Infeasible due to costs (approximately $34,750 per ton of NOx reduced), and timeline concerns to design, permit, and install new equipment.

SMAQMD Analysis

SMAQMD Rule 419 is consistent with other air district rules requiring 40 ppm NOx @ 3 % O_2; however, the rule could be expanded to cover additional smaller in-use equipment. Expanding the applicability to smaller in-use equipment will not achieve any emission reductions within the two-year contingency measure timeframe. SCAQMD Rule 1147 applicability for in-use units allowed an extended compliance schedule of 15 years old. A similar compliance schedule in the SFNA is not likely to obtain emission reductions within the two-year contingency measure timeframe.

For units already complying with Rule 419, a similar compliance schedule to SCAQMD, of 32 years of burner use, will not obtain emission reductions within the contingency measure timeframe. Many of the units in the SMAQMD were retrofitted in 2019 thru 2022. Furthermore, the estimated cost effectiveness for these small units within SMAQMD is estimated to be $40,809 per ton of NOx reduced based on information from the 2008 staff report for SCAQMD Rule 1147.

YSAQMD Analysis

Infeasible due to costs and timeline concerns. Estimated cost effectiveness of $39,082/ton of NOx reduced.

Reasons for infeasibility

Generally, operation of these types of equipment requires an air district permit. To comply with the lower NOx limits, a permitted source would need time to perform engineering/design evaluation for the replacement or retrofitted equipment, apply for and obtain pre-construction permit, purchase and obtain the equipment or retrofit from a manufacturer or distributor, complete the installation or retrofit, perform source test of new or retrofitted equipment, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible.

In addition to timeframe infeasibility, the cost-effectiveness of a measure similar to SCAQMD Rule 1147 is considered to be cost prohibitive within the SFNA air districts.

Water Heaters (Residential) – Less than 1 mmBtu/hr

Water heaters and small boilers predominantly burn natural gas and are used to heat water and generate steam. These units are used in a variety of applications, including in homes, restaurants, retail stores, schools, hotels and office buildings. In SMAQMD Rule 414 and YSAQMD Rule 2.37, NOx emissions from water heaters and boilers rated less than 1 mmBtu/hr are “point-of-sale” rules that that applies to the manufacture and sale of new units as well as new installations.

Relevant Emission Inventory

The emissions inventory associated with residential water heaters is shown in the table below:

District	EIC	Category	2024 Emissions (tpd)	2032 Emissions (tpd)
EDCAQMD	610-608-0110-0000	Residential Fuel Combustion – Natural Gas Water Heating	0.015	0.076
FRAQMD	610-608-0110-0000	Residential Fuel Combustion – Natural Gas Water Heating	0.003	0.003
PCAPCD	610-608-0110-0000	Residential Fuel Combustion – Natural Gas Water Heating	0.024	0.251
SMAQMD	610-608-0110-0000	Residential Fuel Combustion – Natural Gas Water Heating	0.201	0.151
YSAQMD	610-608-0110-0000	Residential Fuel Combustion – Natural Gas Water Heating	0.171	0.115

Potential controls

The table below identifies each of the SFNA air districts rules for residential water heaters. For SMAQMD and YSAQMD, the lowest NOx emission limits are already in effect (excluding electrification).

District	Rule	Emissions Limit (ng/J)

EDCAPD	No Rule	None but due to California requirements in surrounding areas it is assumed all current residential water heaters meets 40 ng/J
FRAQMD	3.23	40 ng/J - mobile home water heaters 14 ng/J – all other units
PCAPCD	246	40 ng/J only for <75,000 Btu/hr
SMAQMD	414	10 ng/J for <75,000 Btu/hr (40 ng/J for mobile home) 14 ng/J for 75,000 to < 1 million Btu/hr (excluding Pool/Spa)
YSAQMD	2.37	10 ng/J for <75,000 Btu/hr (40 ng/J for mobile home) 14 ng/J for 75,000 to < 1 million Btu/hr (excluding Pool/Spa)

Another potential control for residential water heaters is requiring electrification. BAAQMD recently adopted zero emission regulations for furnaces and water heaters for units manufactured in 2027 for water heaters and 2029 for space heaters essentially setting a limit 0 ng/J. The CARB 2022 State SIP Strategy includes a Zero-Emission Standard for Space and Water Heaters measure to be adopted by 2025. This control measure specifies that beginning in 2030, 100 percent of sales of new space and water heaters would need to meet zero emission standard[25]. The state strategy would, therefore, preclude any local strategy and no contingency measure reductions would not be achieved within the two-year timeframe[26].

Reasons for infeasibility

Consistent with the conclusions for Residential Furnaces, due to the time required for turnover of existing units, additional controls of units are not feasible as a continency measure and meaningful reductions would not be achieved within the two-year timeframe needed for contingency measures[27]. In addition to the timeline constraints, any CARB adopted standards that would achieve emission reductions for this category would preclude any district rules for contingency measure reductions.

Turbines

Gas turbines use exhaust gases from the combustion of gaseous or liquid fuels to spin the turbine blades, driving a shaft and producing mechanical power. In most stationary applications, the shaft is coupled to an electrical generator, which converts the mechanical power into electricity. Gas turbines systems are classified as either simple cycle or combined cycle. In a simple cycle system, heat from the hot exhaust gases is not recovered. In a combined cycle system, heat from the exhaust gases is used to produce steam, which passes through a steam turbine, producing additional power.

Emissions Inventory

The emissions inventories associated with turbines is shown in the tables below. No associated inventory or EIC codes for turbines are located in EDCAQMD or FRAQMD.

PCAPCD Inventory

[25] California Air Resources Board. Zero-Emission Space and Water Heater Standards. https://ww2.arb.ca.gov/our-work/programs/building-decarbonization/zero-emission-space-and-water-heater-standards/meetings-workshops
[26] Ibid. p. 50.
[27] Ibid. p. 50.

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
PCAPCD	010-045-0110-0000	Electric Utilities – IC Turbine Engines – Natural Gas	0.039	0.006
PCAPCD	010-045-1200-0000	Electric Utilities – IC Turbine Engines – Diesel/Distillate Oil	0	N/A
PCAPCD	060-045-1200-0000	Service and Commercial – IC Turbine Engines – Diesel/Distillate Oil	0	N/A
Totals			0.039	0.006

SMAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
SMAQMD	010-045-0110-0000	Electric Utilities – IC Turbine Engines – Natural Gas	0.310	0.334
SMAQMD	010-045-1200-0000	Electric Utilities – IC Turbine Engines – Diesel/Distillate Oil	0	N/A
SMAQMD	020-045-0110-0000	Cogeneration – IC Turbine Engines	0	N/A
SMAQMD	050-045-1200-0000	Manufacturing and Industrial – IC Turbine Engines	0	
SMAQMD	060-045-1412-0000	Service and Commercial – IC Turbine Engines – Jet Fuel	0	N/A
Totals			0.310	0.334

YSAQMD Inventory

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
YSAQMD	010-045-0110-0000	Electric Utilities – IC Turbine Engines – Natural Gas	0.002	0.001
YSAQMD	010-045-1200-0000	Electric Utilities – IC Turbine Engines – Diesel/Distillate Oil	0	N/A
YSAQMD	020-045-0110-0000	Cogeneration – IC Turbine Engines – Natural Gas	0	0
YSAQMD	030-045-0110-0000	Oil and Gas Production – IC Turbine Engines	0.003	0.002
YSAQMD	050-045-1200-0000	Manufacturing and Industrial – IC Turbine Engines	N/A	0.001

District	EIC codes	Category	NOx Inventory for source categories (tpd)	
			2024	2032
YSAQMD	052-045-1200-0000	Food and Agricultural Processing – IC Turbine Engines	N/A	0
YSAQMD	060-045-0110-0000	Service and Commercial – IC Turbine Engines – Natural Gas	0.001	0.007
YSAQMD	060-045-0146-0000	Service and Commercial – IC Turbine Engines – Digester Gas	N/A	0.001
YSAQMD	060-045-1200-0000	Service and Commercial – IC Turbine Engines – Diesel/Distillate Oil	0	N/A
YSAQMD	060-045-1412-0000	Service and Commercial – IC Turbine Engines – Jet Fuel	0	N/A
Totals			0.006	0.012

Potential controls:

More stringent limits are in effect in SCAQMD Rule 1134 and SJVUAPCD Rule 4703 than those required in the SFNA. The table below shows a comparison of the limits in the rules.

	NOx Emission Limit for Gaseous Fuel, ppmvd @ 15% O_2				
Unit Rating	SMAQMD Rule 413 /	PCAPCD Rule 250	YSAQMD 2.34	SCAQMD Rule 1134 (Amended 2019)	SJVUAPCD Rule 4703
≥0.3 to <2.9 MW	42	42	42	**2.5**	9
a≥2.9 to <10 MW and <877 hr/yr operation	42	25	42	**2.5**	9
≥2.9 to <10 MW and ≥877 hr/yr operation	25	25	25	**2.5**	8
≥10 MW (no SCR) and <877 hr/yr operation	42	9	9	**2.5**	5 25 (if <200 hr/yr)
≥10 MW (no SCR) and ≥877 hr/yr operation	15	9	9	**2.5**	5
≥10 MW (w/ SCR) and <877 hr/yr operation	42	9	9	**2.5**	5 25 (if <200 hr/yr)
≥10 MW (w/ SCR) and ≥877 hr/yr operation	9	9	9	**2.5**	5

	NOx Emission Limit for Gaseous Fuel, ppmvd @ 15% O_2				
Unit Rating	SMAQMD Rule 413 /	PCAPCD Rule 250	YSAQMD 2.34	SCAQMD Rule 1134 (Amended 2019)	SJVUAPCD Rule 4703
≥60 MW Combined Cycle <877 hr/yr operation	42	9	9	**2**	5 25 (if <200 hr/yr)
≥60 MW Combined Cycle ≥877 hr/yr operation	15 (no SCR) 9 (w/ SCR) /	15 (no SCR) 9 (w/SCR)	9	**2**	5

The lower limits of SCAQMD and SJVUAPCD are feasible and considered cost effective. No source specific turbines were identified in EDCAQMD or FRAQMD.

PCAPCD Analysis

The total NOx emissions from gas turbine operations are less than 0.006 tpd in 2032. Infeasible as a contingency measure because this control measure will result in minimal emission reductions.

SMAQMD Analysis

A review of the permits for the stationary gas turbines in SMAQMD shows that about half the existing turbines in Sacramento County could require retrofit to meet the lower SCAQMD NOx emission limits resulting in additional emission reductions. SCAQMD estimated a NOx reduction of 87.5%; however, further analysis of District permits found an estimated reduction of 25%. Infeasible as a contingency measure because achieving emissions reductions with retrofit technology (SCR) within 2 years is technologically infeasible for this category.

YSAQMD Analysis

A review of the permit for the stationary gas turbines in YSAQMD shows that the existing turbines could require retrofit to meet the lower SCAQMD NOx emission limits resulting in additional emission reductions. The current permit limit for the permitted turbines is 3.0 ppmv @ 15% O_2. Reducing the emission limit for these turbines to those in SCAQMD Rule 1134 would result in emission reductions of approximately 17%. Infeasible due to minimal reductions (0.0002 tpd of NOx reduced) and timeline concerns to design, permit, and install new equipment with retrofit SCR technology.

Reasons for infeasibility:

The potential contingency measures for this category would involve requiring installation of SCR on additional units or modification of SCR. In 2018, the SCAQMD provided approximately 6 years for compliance with new limits for combustion turbines in SCAQMD in Rule 1135. SCAQMD recently (February 22, 2023) proposed to revise Rule 1135 to provide an additional 3 months for compliance. SCAQMD Rule 1134 provides 24-36 months from issuance of a permit to construct to meet revised emission limits.

To comply with the lower NOx limits, a permitted source in the SFNA would need time to perform engineering/design evaluation for the replacement or retrofitted equipment, apply for and obtain pre-construction permit, purchase and obtain the equipment or retrofit from a manufacturer or distributor, complete the installation or retrofit, perform source test of new or retrofitted equipment, and obtain an operating (post-construction) permit. Thus, the time to complete all listed tasks in less than 2 years of a triggering event to obtain meaningful reductions within 2 years is not feasible.