

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report

South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS

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South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS

EXECUTIVE SUMMARY

Overview

The South Coast Air Basin (Basin) is in “extreme” nonattainment of the 2015 8-hour ozone National Ambient Air Quality Standard (NAAQS or standard). In December 2022, the South Coast Air Quality Management District (South Coast AQMD) adopted the 2022 Air Quality Management Plan (AQMP), which provides the strategy for the Basin to meet the 2015 8-hour ozone standard by 2037.¹ This plan called for an economy-wide transition to zero emissions technology wherever feasible to reduce emissions of ozone precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOC), leaving few opportunities for further emission reductions.

While the 2022 AQMP satisfied most Clean Air Act (CAA) requirements applicable to “extreme” nonattainment areas, it did not formally address contingency measure requirements due to the lack of U.S. EPA’s guidance at the time of adoption. Contingency measures are defined by CAA 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.” At the time the 2022 AQMP was adopted, U.S. EPA was developing updated contingency measure guidance as courts had invalidated certain aspects of its prior interpretation of contingency measure requirements. Therefore, the 2022 AQMP committed to address contingency measure requirements once U.S. EPA issued new guidance. In December 2024, U.S. EPA issued updated contingency measure guidance.² The South Coast Air Basin Contingency Measure State Implementation Plan (SIP) Revision for the 2015 8-Hour Ozone Standard (South Coast Ozone Contingency SIP Revision) has been developed in response to the new guidance to satisfy contingency measure requirements in the Basin.

U.S. EPA’s Updated Contingency Measure Guidance

In response to court decisions which altered the interpretation of contingency measure requirements, U.S. EPA’s new contingency measure guidance introduces key changes affecting the following three aspects of contingency measures:

1. The recommended quantity of emission reductions to be achieved by contingency measures.
2. The documentation needed to support a claim that there are insufficient contingency measures to achieve the recommended emission reductions.
3. The length of time during which emission reductions from contingency measures must be achieved.

¹ South Coast AQMD, 2022 Air Quality Management Plan, December 2022.

<https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16>

² U.S. EPA, Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter. December 3, 2024.

https://www.epa.gov/system/files/documents/2024-12/cmtf-final-guidance-signature-version-11-22-24_clean_0.pdf

Previously, the recommended amount of emission reductions was fixed at 3 percent of the base year inventory. U.S. EPA now recommends that contingency measures achieve emission reductions that are equivalent to One Year's Worth (OYW) of progress. OYW of progress provides greater flexibility by considering the amount of emission reductions an area needs to meet the standard.

If contingency measures do not achieve OYW of progress, U.S. EPA's guidance requires the development of a reasoned justification for achieving less than the recommended amount. The justification seeks to identify and evaluate potential contingency measures based on their technological and economic feasibility, while also considering that contingency measures must be implemented and achieve emission reductions within two years.

Contingency Measures for Stationary and Mobile Sources

The South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS includes contingency measures for both stationary and mobile sources that reduce NO_x and VOC emissions. Consistent with the CAA and U.S. EPA's guidance, the contingency measures achieve additional reductions beyond those needed for attainment and satisfy the requirement for a triggering mechanism to automatically implement the measure upon a failure to attain or achieve a reasonable further progress (RFP) milestone.

For stationary sources, South Coast AQMD has introduced contingency measures in three rules: Rule 445 – Wood-Burning Devices, Rule 463 – Organic Liquid Storage, and Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants. Briefly, the rules implement contingency measures through a wood burning curtailment program and enhanced leak detection and repair. If triggered, contingency measures in all three rules would be implemented simultaneously. Rules 445 and 1173 contain multiple contingency measures which are designed to be implemented sequentially.

A mobile source contingency measure, the California Smog Check Contingency Measure State Implementation Plan Revision, was adopted by the California Air Resources Board (CARB) in October 2023.³ Currently, new vehicles are exempt from the smog check program for the first 8 years. If triggered, the contingency measure will narrow the newer model year vehicle smog check exemption from 8 to 7 years and 7 to 6 years upon the first and second triggering, respectively. Emission reductions would be achieved by identifying additional emissions control equipment failures from vehicles previously exempt. On July 9, 2024, U.S. EPA approved the smog check contingency measure.⁴

³ CARB, California Smog Check Contingency Measure State Implementation Plan Revision, September 15, 2023. https://ww2.arb.ca.gov/sites/default/files/2023-09/Smog_Check_CM_SIP_Revision_Final.pdf

⁴ U.S. EPA, Air Plan Revisions; California; Vehicle Inspection and Maintenance Contingency Measure, 89 Fed. Reg. 56222 (July 9, 2024). <https://www.federalregister.gov/documents/2024/07/09/2024-14355/air-plan-revisions-california-vehicle-inspection-and-maintenance-contingency-measure>

The stationary and mobile source contingency measures achieve less than OYW of progress for the 2015 8-hour ozone standard in the Basin. Therefore, consistent with U.S. EPA's guidance, the South Coast Ozone Contingency SIP Revision contains infeasibility justifications demonstrating the scarcity of further contingency measure opportunities for all stationary and mobile source categories contributing VOC and NOx emissions in the Basin.

The South Coast Ozone Contingency SIP Revision seeks to fulfill contingency measure requirements in CAA Sections 172(c)(9) and 182(c)(9) and comply with applicable case law. Staff recommends adoption of the South Coast Ozone Contingency SIP Revision for submission to U.S. EPA via CARB.

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

CHAPTER 1: INTRODUCTION

Background on the 2022 AQMP

In December 2015, the United States Environmental Protection Agency (U.S. EPA) revised the National Ambient Air Quality Standard (NAAQS or standard) for ozone, lowering the threshold to 70 parts per billion, averaged over an 8-hour period. The South Coast Air Basin (Basin), including Orange County and urban portions of Los Angeles, Riverside, and San Bernardino counties, was designated as an “extreme” nonattainment area for the 2015 ozone standard with attainment by 2037. The 2022 Air Quality Management Plan (AQMP) outlines a strategy to meet this standard by 2037 through an economy-wide transition to zero emissions technology, wherever feasible, to reduce emissions of ozone precursors, nitrogen oxides (NOx) and volatile organic compounds (VOC).⁵ The 2022 AQMP control strategy is expected to reduce NOx emissions by about 67 percent over 2037 baseline (i.e., business-as-usual) levels, and about 83 percent below 2018 levels.

While the 2022 AQMP satisfied most Clean Air Act (CAA) requirements applicable to “extreme” nonattainment areas, it did not formally address contingency measure requirements due to the absence of U.S. EPA’s guidance at the time adoption. Contingency measures are defined by CAA 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.” CAA Section 182(c)(9) further requires that ozone nonattainment areas classified as “serious” or above provide for contingency measures to be implemented if the area fails to meet any applicable milestone. These measures are to be adopted and held in reserve to be automatically triggered in the aforementioned scenarios. Concurrently, nonattainment areas are obligated to implement all feasible measures to reduce emissions, and to attain ambient air quality standards as expeditiously as possible.

Legal Challenges and U.S. EPA’s Guidance for Contingency Measures

While the CAA requires contingency measures, it does not specify the amount of emission reductions needed for these measures. Historically, the U.S. EPA has interpreted the amount of emission reductions needed as equivalent to one year’s worth of progress and has also allowed states to meet contingency measure requirements by relying on excess emission reductions from the ongoing implementation of adopted emission reduction programs. However, a series of court decisions reshaped the interpretation of these requirements. In the 2016 case of *Bahr v. U.S. Environmental Protection Agency*⁶ (*Bahr*), the 9th Circuit Court of Appeals ruled the U.S. EPA erred in approving a contingency measure that relied on an already-implemented measure for a nonattainment area in Arizona, thereby rejecting the U.S. EPA’s

⁵ The 2022 AQMP was adopted by the South Coast AQMD’s Governing Board on December 2, 2022 and submitted to U.S. EPA on February 23, 2023 via CARB.

⁶ *Bahr v. U.S. Environmental Protection Agency*, (9th Cir. 2016) 836 F.3d 1218

longstanding interpretation of CAA Section 172(c)(9). The U.S. EPA staff interpreted this decision to mean that contingency measures must include a future action triggered by a failure to attain, failure to make reasonable further progress, or failure to submit a quantitative milestone report. This decision was applicable to the states covered by the 9th Circuit Court, while the U.S. EPA continued to approve contingency measures using their pre-Bahr stance in the rest of country. In January 2021, in the case of *Sierra Club v. Environmental Protection Agency*,⁷ 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 the necessity to develop contingency measures for the 75 ppb 8-hour ozone SIPs, the California Air Resources Board (CARB) developed the statewide Enhanced Enforcement Contingency Measure (Enforcement Contingency Measure), which was included in the *2018 Updates to the California State Implementation Plan*. CARB collaborated closely with the U.S. EPA regional staff in developing the contingency measure package that included the triggered Enforcement Contingency Measure, a district-triggered measure/commitment, and emission reductions from the on-going implementation of CARB's mobile source emissions program. However, in their action on the *San Joaquin Valley 2016 Ozone Plan for 2008 8-hour Ozone Standard* SIP, the U.S. EPA stated that the Enforcement Contingency Measure did not satisfy the requirements to be approved as a "standalone contingency measure" and approved it only as a "SIP strengthening" measure. The U.S. EPA did approve the district's 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.

The Association of Irrigated Residents filed a lawsuit against the U.S. 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 9th Circuit Court of Appeals issued its decision in *Association of Irrigated Residents v. EPA*⁸ (*AIR*) that the U.S. 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 emission reductions. Most importantly, the 9th Circuit Court said that, in line with the U.S. 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 must 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 unless the U.S. EPA formally changes its historic stance on the amount of reductions required. The U.S. EPA staff has interpreted *AIR* to mean that triggered contingency measures must achieve the entirety of the required one year's worth of emission reductions on their own. Additionally, surplus emission reductions from ongoing programs cannot reduce the amount of reductions needed for contingency.

In response to *Bahr* and *Sierra Club*, in 2021, U.S. EPA convened a nationwide internal task force to develop guidance to support states in their development of contingency measures and released Draft Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area

⁷ *Sierra Club v. Environmental Protection Agency*, (D.C. Cir. 2021) 985 F.3d 1055

⁸ *Association of Irrigated Residents v. U.S. Environmental Protection Agency*, (9th Cir. 2021) 10 F.4th 937

Contingency Measure Requirements for Ozone and Particulate Matter in March 2023 and finalized it in December 2024.⁹ U.S. EPA's new contingency measure guidance introduces key changes affecting the following three aspects of contingency measures: (1) the quantity of emission reductions required to be achieved by contingency measures; (2) the documentation needed to support a claim that there are insufficient contingency measures to achieve the required emission reductions; and (3) the length of time during which emission reductions from contingency measures must be achieved.

South Coast AQMD's Opportunities for Contingency Measures

South Coast AQMD has over 40 years of experience regulating stationary sources, implementing one of the most stringent and comprehensive control programs in the country. Hence, South Coast AQMD's air quality regulations are mature, leading to challenges to identify contingency measures. This difficulty arises from the fact that most feasible measures have already been or will be implemented to meet air quality standards, leaving little to no potential emission reductions in reserve to use as contingency measures. The paucity of available measures is further exacerbated by the need for an economy-wide transition to zero emissions technology to meet the 2015 ozone standard by 2037.

As a local air agency, South Coast AQMD's primary authority is in regulating stationary sources. Of the 49 control measures that South Coast AQMD committed to implement in the 2022 AQMP, 31 target stationary sources. Because these measures are needed for attainment, they cannot be withheld for contingency. However, the bulk of the emissions responsible for ozone nonattainment are from mobile sources, for which CARB and the federal government possess direct regulatory authority. Despite lacking direct regulatory authority in this area, South Coast AQMD has explored reducing mobile source emissions using innovative approaches such as indirect source rules, voluntary Memoranda of Understanding, and incentive measures to maximize much needed emission reductions for attainment.

South Coast AQMD has prepared the South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS (South Coast Ozone Contingency SIP Revision) to satisfy contingency measure requirements in CAA Sections 172(c)(9) and 182(c)(9) and comply with applicable case law. While the potential for further emission reductions is limited, South Coast AQMD has introduced ozone contingency measures in three stationary source rules. In addition, CARB has adopted a mobile source contingency measure. These measures are summarized below:

- Rule 445 – Wood-Burning Devices (Amended October 27, 2020), which includes contingency measures to prohibit the use of indoor or outdoor wood-burning devices in the Basin if the daily maximum 8-hour ozone air quality forecast exceeds specified thresholds.

⁹ U.S. EPA, Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter. December 3, 2024. Retrieved from: https://www.epa.gov/system/files/documents/2024-12/cmtf-final-guidance-signature-version-11-22-24_clean_0.pdf

- Rule 463 – Organic Liquid Storage (Amended June 7, 2024), which includes a contingency measure that requires more frequent enhanced leak detection and repair of organic liquid storage tanks.
- Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended November 1, 2024), which contains contingency measures that include more frequent inspections and stricter leak detection thresholds.
- The California Smog Check Contingency Measure (Adopted October 2023) shortens the current exemption period for new vehicles from 8 years to 7 years after the first trigger and to 6 years after the second, aiming to identify additional emissions control equipment failures in previously exempt vehicles. On July 9, 2024, U.S. EPA approved the smog check contingency measure.¹⁰

While these measures reduce VOC and NO_x emissions, they do not achieve the amount of emission reductions recommended by U.S. EPA’s guidance. Therefore, the South Coast Ozone Contingency SIP Revision includes a robust infeasibility justification, demonstrating the scarcity of remaining measures.

Contingency Measures for the 2008 8-hour Ozone Standard

The South Coast Ozone Contingency SIP Revision specifically addresses the 2015 8-hour ozone standard. While the Basin is also in “extreme” nonattainment for the 2008 8-hour ozone standard, the contingency measure requirements applicable for the standard were met as described below.

In 2019, U.S. EPA conditionally approved the Reasonable Further Progress (RFP) contingency measure element for the 2008 ozone standard in the Basin based on a commitment by South Coast AQMD to adopt and submit a contingency measure for incorporation into the SIP within 12 months of the conditional approval.¹¹ To comply with the requirement, South Coast AQMD amended Rule 445 to incorporate ozone contingency measures in October 2020 and subsequently submitted it to U.S. EPA. Although Rule 445 alone satisfied the commitment, South Coast AQMD incorporated additional contingency measures in Rules 463 and 1173 and CARB adopted the California Smog Check Contingency Measure which also applies to the 2008 ozone standard in the Basin.

While the contingency measure analysis in the South Coast Ozone Contingency SIP Revision was developed for the 2015 ozone standard, its findings remain valid if extended to the 2008 ozone standard. This is because any potential contingency measures deemed infeasible for the 2015 standard would also be infeasible for the 2008 standard. Additionally, the RFP milestone years for the 2008 standard overlap with those of the 2015 standard, and its attainment year (2031) is earlier than that of the 2015 standard

¹⁰ U.S. EPA, Air Plan Revisions; California; Vehicle Inspection and Maintenance Contingency Measure, 89 Fed. Reg. 56222 (July 9, 2024). <https://www.federalregister.gov/documents/2024/07/09/2024-14355/air-plan-revisions-california-vehicle-inspection-and-maintenance-contingency-measure>

¹¹ 84 FR 52005

(2037). As a result, the analysis indicates that there are no additional feasible contingency measures for the 2008 ozone standard.

Format of This Document

This document is organized into seven chapters, each addressing a specific topic. Each of the chapters is summarized below.

Chapter 1, “Introduction,” includes background on the 2022 AQMP, U.S. EPA’s guidance, and South Coast AQMD and CARB’s contingency measures.

Chapter 2, “Emissions Inventory,” summarizes the emissions inventory and provides a calculation of the recommended amount of emission reductions from contingency measures per U.S. EPA’s guidance.

Chapter 3, “South Coast AQMD’s Contingency Measures,” provides details on the stationary source contingency measures for the Basin and a comparison of the reductions achieved by the measures to the amount recommended by U.S. EPA.

Chapter 4, “Infeasibility Justification,” demonstrates the scarcity of additional contingency measures for stationary sources.

Chapter 5, “Public Process,” discusses the role of public participation in developing the South Coast Ozone Contingency SIP Revision.

Chapter 6, “California Environmental Quality Act Analysis and Socioeconomic Impact Assessment,” discusses legal requirements related to CEQA and socioeconomic impact assessments.

Chapter 7, “Staff Recommendation,” provides staff’s recommendation to adopt the South Coast Ozone Contingency SIP Revision.

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

CHAPTER 2: EMISSIONS INVENTORY

Emissions Inventory

The emissions inventory used in this plan is based on the 2022 AQMP, as it contained the South Coast Air Basin (Basin) attainment demonstration for the 2015 8-hour ozone standard. Major updates to the stationary source emissions were introduced in the 2022 AQMP. The changes in emissions stem from updates in methodologies, socioeconomic factors, activity/consumption/throughput data and recently adopted regulations. For the 2018 base year, area source emissions were estimated using the latest available activity data and emission factors, while point source emissions were reported emissions through the Annual Emission Reporting program.

Emissions from the South Coast Air Basin

Table 2-1 presents the summer planning emissions of VOCs and NO_x for the Basin by Major Source Category (MSC) in 2018, the base year of the 2022 AQMP. Stationary sources contribute over half of the Basin total VOC emissions, with consumer products being the largest source category. On-road mobile sources contribute 20 percent of the VOC emissions, with passenger cars being the largest category contributing 7.4 percent of total VOC emissions in the Basin. Off-road mobile sources contribute to the remaining VOC emissions, with off-road equipment being the largest source. In contrast, NO_x emissions are dominated by mobile sources. Stationary sources only contribute 15 percent of the total NO_x emissions. The largest contributors to NO_x from stationary sources are fuel combustion in residential and commercial buildings followed by petroleum refining. On-road sources account for 44 percent of the NO_x emissions, with heavy-duty trucks being the largest source with 27 percent of the Basin total NO_x emissions. Off-road sources contribute 41 percent of all NO_x emissions, with off-road equipment being the largest source.

Table 2-2 presents the summer planning emissions of VOCs and NO_x for the Basin by MSC in 2037, the attainment year for the 2015 8-hour ozone standard. This inventory, commonly referred to “baseline” emissions, reflects already adopted rules and regulations but not the reductions from the attainment strategy described in the 2022 AQMP. In comparison to 2018, emissions from on-road sources decline as a result of ongoing on-road vehicle regulations and turnover to cleaner vehicles. Similarly, emissions from off-road equipment also decline due to switching to cleaner equipment. On the other hand, VOC emissions from consumer products are projected to increase due to the increase in population and human activity. NO_x emissions from aircraft and trains are expected to increase due to the increase in economic activity and lack of newer and more stringent regulatory actions compared to stationary and other mobile source categories. As in 2018, stationary sources constitute the largest fraction of VOC emissions, with emissions from consumer products being the largest source. The relative contribution of on-road mobile sources to VOCs decreases, particularly from light and medium duty vehicle classes. The relative contribution of off-road sources to VOC emissions also decreases with respect to 2018, due to decreasing emissions from off-road equipment. In 2037, NO_x emissions from mobile sources continue to be the largest contributor to total NO_x in the Basin, despite the large reductions projected from on-road vehicles. NO_x emissions from

stationary sources are projected to decrease, although their relative contribution to total NO_x emissions increases to 22 percent. This is because of substantial emission reductions in on-road mobile sources, which decrease their relative contribution from 44 percent to 20 percent of the Basin total. Still, heavy-duty trucks are the largest source of NO_x emissions in on-road vehicles. Off-road sources emit most of the NO_x in 2037, with ships and aircraft becoming the largest emission sources in the Basin, contributing 32 percent of all NO_x emissions.

The emissions are presented by MSC for brevity, however the infeasibility justification presented in Chapter 4 was conducted at the Emissions Inventory Code (EIC) level, identifying further details such as fuel, equipment, and process type in each MSC.

TABLE 2-1
SUMMER PLANNING EMISSIONS FOR THE BASIN BY MAJOR SOURCE CATEGORY IN 2018

MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
10	Electric Utilities	0.33	0.08	2.13	0.61
20	Cogeneration	0.02	0.00	0.03	0.01
30	Oil and Gas Production (combustion)	0.12	0.03	1.29	0.37
40	Petroleum Refining (Combustion)	1.38	0.34	10.27	2.93
50	Manufacturing and Industrial	0.95	0.23	10.01	2.85
52	Food and Agricultural Processing	0.05	0.01	0.42	0.12
60	Service and Commercial	1.89	0.47	9.37	2.67
99	Other (Fuel Combustion)	0.68	0.17	3.17	0.90
110	Sewage Treatment	0.28	0.07	0.00	0.00
120	Landfills	8.64	2.13	0.48	0.14
130	Incineration	0.04	0.01	1.22	0.35
140	Soil Remediation	0.00	0.00	0.00	0.00
199	Other (Waste Disposal)	7.67	1.89	0.01	0.00
210	Laundering	0.17	0.04	0.00	0.00
220	Degreasing	12.98	3.20	0.00	0.00
230	Coatings and Related Processes	18.43	4.54	0.00	0.00
240	Printing	0.75	0.18	0.00	0.00
250	Adhesives and Sealants	5.14	1.27	0.00	0.00
299	Other (Cleaning and Surface Coatings)	0.63	0.16	0.05	0.01
310	Oil and Gas Production	2.35	0.58	0.01	0.00
320	Petroleum Refining	4.44	1.09	0.92	0.26
330	Petroleum Marketing	13.78	3.39	0.05	0.01
399	Other (Petroleum Production and Marketing)	0.04	0.01	0.01	0.00
410	Chemical	4.45	1.10	0.09	0.03
420	Food and Agriculture	0.52	0.13	0.01	0.00
430	Mineral Processes	0.40	0.10	0.23	0.07
440	Metal Processes	0.10	0.02	0.34	0.10
450	Wood and Paper	0.24	0.06	0.00	0.00
460	Glass and Related Products	0.00	0.00	0.00	0.00
470	Electronics	0.01	0.00	0.00	0.00
499	Other (Industrial Processes)	5.07	1.25	0.01	0.00
510	Consumer Products	107.38	26.45	0.00	0.00
520	Architectural Coatings and Related Solvent	10.62	2.62	0.00	0.00
530	Pesticides/Fertilizers	1.12	0.28	0.00	0.00
540	Asphalt Paving/Roofing	1.20	0.30	0.00	0.00

MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
610	Residential Fuel Combustion	2.25	0.55	11.35	3.24
620	Farming Operations	1.86	0.46	0.00	0.00
630	Construction and Demolition	0.00	0.00	0.00	0.00
640	Paved Road Dust	0.00	0.00	0.00	0.00
645	Unpaved Road Dust	0.00	0.00	0.00	0.00
650	Fugitive Windblown Dust	0.00	0.00	0.00	0.00
660	Fires	0.29	0.07	0.08	0.02
670	Waste Burning and Disposal	0.21	0.05	0.05	0.01
690	Cooking	1.08	0.27	0.00	0.00
699	Other (Miscellaneous Processes	0.00	0.00	0.00	0.00
710	Light Duty Passenger Auto (LDA)	29.85	7.35	20.88	5.95
722	Light Duty Trucks 1 (T1)	7.82	1.93	5.25	1.50
723	Light Duty Trucks 2 (T2)	14.68	3.62	13.63	3.89
724	Medium Duty Trucks (T3)	12.92	3.18	12.38	3.53
732	Light Heavy Duty Gas Trucks 1 (T4)	2.50	0.62	2.12	0.60
733	Light Heavy Duty Gas Trucks 2 (T5)	0.37	0.09	0.33	0.09
734	Medium Heavy Duty Gas Trucks (T6)	0.50	0.12	0.89	0.25
736	Heavy Heavy Duty Gas Trucks (HHD)	0.01	0.00	0.05	0.01
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.26	0.06	7.61	2.17
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.09	0.02	2.52	0.72
744	Medium Heavy Duty Diesel Truck (T6)	1.14	0.28	22.99	6.55
746	Heavy Heavy Duty Diesel Trucks (HHD)	2.32	0.57	58.41	16.65
750	Motorcycles (MCY)	8.17	2.01	1.90	0.54
760	Diesel Urban Buses (UB)	0.24	0.06	1.99	0.57
762	Gas Urban Buses (UB)	0.01	0.00	0.03	0.01
771	Gas School Buses (SB)	0.04	0.01	0.05	0.01
772	Diesel School Buses (SB)	0.03	0.01	2.14	0.61
777	Gas Other Buses (OB)	0.10	0.02	0.23	0.07
778	Motor Coaches	0.05	0.01	0.85	0.24
779	Diesel Other Buses (OB)	0.06	0.01	0.90	0.26
780	Motor Homes (MH)	0.08	0.02	0.71	0.20
810	Aircraft	3.53	0.87	17.16	4.89
820	Trains	0.69	0.17	15.10	4.30
833	Ocean Going Vessels	9.36	2.31	32.21	9.18
835	Commercial Harbor Crafts	0.33	0.08	5.86	1.67
840	Recreational Boats	22.49	5.54	3.86	1.10
850	Off-Road Recreational Vehicles	1.62	0.40	0.03	0.01
860	Off-Road Equipment	59.50	14.66	59.48	16.96
861	Off-Road Equipment (PERP)	0.76	0.19	8.83	2.52
870	Farm Equipment	0.41	0.10	0.81	0.23
890	Fuel Storage and Handling	8.48	2.09	0.00	0.00

MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
	Total Stationary Point and Area Sources	217.56	53.59	51.59	14.71
	Total On-Road Vehicles	81.22	20.01	155.85	44.43
	Total Other Mobile	107.16	26.40	143.35	40.87
	Total	405.94	100.00	350.78	100.00

TABLE 2-2
SUMMER PLANNING EMISSIONS FOR THE BASIN BY MAJOR SOURCE CATEGORY IN 2037

MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
10	Electric Utilities	0.27	0.08	2.56	1.39
20	Cogeneration	0.02	0.01	0.02	0.01
30	Oil and Gas Production (combustion)	0.19	0.06	0.97	0.53
40	Petroleum Refining (Combustion)	1.38	0.41	3.90	2.11
50	Manufacturing and Industrial	0.93	0.27	7.85	4.26
52	Food and Agricultural Processing	0.05	0.01	0.40	0.22
60	Service and Commercial	2.04	0.60	9.98	5.41
99	Other (Fuel Combustion)	0.69	0.20	2.68	1.45
110	Sewage Treatment	0.31	0.09	0.00	0.00
120	Landfills	9.73	2.87	0.42	0.23
130	Incineration	0.04	0.01	1.25	0.68
140	Soil Remediation	0.00	0.00	0.00	0.00
199	Other (Waste Disposal)	8.14	2.40	0.01	0.01
210	Laundering	0.19	0.06	0.00	0.00
220	Degreasing	13.51	3.99	0.00	0.00
230	Coatings and Related Processes	20.78	6.14	0.00	0.00
240	Printing	0.89	0.26	0.00	0.00
250	Adhesives and Sealants	4.62	1.36	0.00	0.00
299	Other (Cleaning and Surface Coatings)	0.65	0.19	0.04	0.02
310	Oil and Gas Production	4.47	1.32	0.01	0.01
320	Petroleum Refining	4.44	1.31	0.55	0.30
330	Petroleum Marketing	11.11	3.28	0.02	0.01
399	Other (Petroleum Production and Marketing)	0.04	0.01	0.01	0.01
410	Chemical	4.57	1.35	0.07	0.04
420	Food and Agriculture	0.58	0.17	0.03	0.02
430	Mineral Processes	0.45	0.13	0.47	0.25
440	Metal Processes	0.12	0.04	0.34	0.18
450	Wood and Paper	0.26	0.08	0.00	0.00
460	Glass and Related Products	0.00	0.00	0.00	0.00
470	Electronics	0.02	0.01	0.00	0.00
499	Other (Industrial Processes)	5.37	1.59	0.03	0.02
510	Consumer Products	132.42	39.10	0.00	0.00
520	Architectural Coatings and Related Solvent	12.44	3.67	0.00	0.00
530	Pesticides/Fertilizers	1.20	0.35	0.00	0.00
540	Asphalt Paving/Roofing	1.41	0.42	0.00	0.00

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MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
610	Residential Fuel Combustion	2.23	0.66	9.51	5.16
620	Farming Operations	1.30	0.38	0.00	0.00
630	Construction and Demolition	0.00	0.00	0.00	0.00
640	Paved Road Dust	0.00	0.00	0.00	0.00
645	Unpaved Road Dust	0.00	0.00	0.00	0.00
650	Fugitive Windblown Dust	0.00	0.00	0.00	0.00
660	Fires	0.29	0.09	0.08	0.04
670	Waste Burning and Disposal	0.22	0.06	0.10	0.05
690	Cooking	1.21	0.36	0.00	0.00
699	Other (Miscellaneous Processes)	0.00	0.00	0.00	0.00
710	Light Duty Passenger Auto (LDA)	11.31	3.34	6.92	3.75
722	Light Duty Trucks 1 (T1)	2.19	0.65	1.05	0.57
723	Light Duty Trucks 2 (T2)	6.21	1.83	3.02	1.64
724	Medium Duty Trucks (T3)	4.93	1.46	2.13	1.15
732	Light Heavy Duty Gas Trucks 1 (T4)	0.51	0.15	0.42	0.23
733	Light Heavy Duty Gas Trucks 2 (T5)	0.08	0.02	0.08	0.04
734	Medium Heavy Duty Gas Trucks (T6)	0.21	0.06	0.14	0.08
736	Heavy Heavy Duty Gas Trucks (HHD)	0.00	0.00	0.02	0.01
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.10	0.03	0.58	0.31
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.04	0.01	0.28	0.15
744	Medium Heavy Duty Diesel Truck (T6)	0.06	0.02	4.46	2.42
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.86	1.16	13.69	15.14
750	Motorcycles (MCY)	9.19	0.18	2.16	8.40
760	Diesel Urban Buses (UB)	0.02	2.94	0.11	16.62
762	Gas Urban Buses (UB)	0.00	0.08	0.01	2.95
771	Gas School Buses (SB)	0.07	3.18	0.03	1.82
772	Diesel School Buses (SB)	0.01	0.23	0.68	0.02
777	Gas Other Buses (OB)	0.07	6.27	0.05	10.75
778	Motor Coaches	0.01	0.16	0.12	1.86
779	Diesel Other Buses (OB)	0.00	0.03	0.36	0.15
780	Motor Homes (MH)	0.02	1.77	0.37	0.00
810	Aircraft	3.93	1.16	27.93	15.14
820	Trains	0.61	0.18	15.50	8.40
833	Ocean Going Vessels	9.97	2.94	30.65	16.62
835	Commercial Harbor Crafts	0.28	0.08	5.45	2.95
840	Recreational Boats	10.76	3.18	3.35	1.82
850	Off-Road Recreational Vehicles	0.77	0.23	0.04	0.02
860	Off-Road Equipment	21.24	6.27	19.83	10.75
861	Off-Road Equipment (PERP)	0.54	0.16	3.43	1.86
870	Farm Equipment	0.11	0.03	0.28	0.15
890	Fuel Storage and Handling	6.00	1.77	0.00	0.00

MSC	Description	VOC (tpd)	% VOC	NOx (tpd)	% NOx
	Total Stationary Point and Area Sources	248.58	73.40	41.31	22.40
	Total On-Road Vehicles	35.88	10.59	36.69	19.89
	Total Other Mobile	54.22	16.01	106.46	57.71
	Total	338.68	100.00	184.46	100.00

One Year's Worth of Progress for NOx and VOC

Table 2-3 summarizes One Year's Worth (OYW) of progress for NOx and VOC. The calculation considers the Basin's emissions inventory (EI) for the 2018 base year and the 2037 attainment year and the number of years between the base and attainment years, as shown below:

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

The 2037 attainment year EI differs from the baseline emissions presented in Table 2-2 as it reflects implementation of the 2022 AQMP control strategy. Consistent with U.S. EPA's guidance, OYW of NOx and VOC reductions are calculated to be 2.63 tpd and 3.52 tpd, respectively. Chapter 3 presents a comparison of the reductions achieved by South Coast AQMD's contingency measures with OYW of progress.

TABLE 2-3
ONE YEAR'S WORTH OF NOX AND VOC EMISSION REDUCTIONS FOR THE SOUTH COAST AIR BASIN
(TONS PER DAY)

Emission Inventory	NOx (tpd)	VOC (tpd)
2018 Base Year EI	350.78	405.94
2037 Attainment Year EI	60.21	321.34
OYW of Progress	2.63	3.52

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**CHAPTER 3: SOUTH COAST AQMD'S
CONTINGENCY MEASURES**

Contingency Measure Identification and Analysis

South Coast AQMD followed the procedures outlined in the U.S. EPA's guidance for the preparation of a contingency measure SIP revision. These procedures, which involve the identification of existing and potential controls and evaluation of the feasibility of such controls, are outlined below:

1. Thoroughly examine the emission sources in the Basin and identify applicable rules.
2. Compare existing rule requirements with those in other jurisdictions and identify potential control measures.
3. Review each of the measures identified in Step 2 to determine whether it is feasible to implement within up to two years of a contingency measure qualifying event. If feasible, include the measure in the contingency measure submission.
4. For the remaining infeasible measures from Step 3, document the reason why each measure is infeasible as a contingency measure, including whether the conclusion is based on technological, economic, or other infeasibility considerations. This evaluation is provided in the next chapter.

During the first step in the analysis, examination of the emission sources in the Basin led to the identification of ozone contingency measures in three of South Coast AQMD's rules: Rule 445 – Wood-Burning Devices, Rule 463 – Organic Liquid Storage, and Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants. Contingency measures have already been incorporated into these rules, which contain automatic triggering mechanisms to ensure that the contingency measures would become effective upon a U.S. EPA finding of a failure to either attain an ozone standard or comply with Reasonable Further Progress (RFP) requirements. A summary of each rule's requirements and contingency measures is presented below.

Rule 445

Rule 445 – Wood-Burning Devices reduces emissions from wood-burning devices such as fireplaces or wood stoves. It was originally adopted in 2008 to implement control measure BCM-03 – Emission Reductions from Wood Burning Fireplaces and Wood Stoves in the 2007 AQMP. The rule contains requirements regarding the sale and installation of wood-burning devices, prohibits the burning or sale of unseasoned wood, and includes curtailment of wood-burning on “No-Burn” days when the ambient concentration of PM_{2.5} is forecast to exceed the curtailment threshold.

In June 2020, Rule 445 was amended to incorporate PM_{2.5} contingency measures. The rule was subsequently amended in October 2020 to add ozone contingency measures.¹² If triggered, the ozone contingency measure will extend the wood-burning season from September 1 through April 30 and require wood-burning curtailment on days when the ambient daily maximum 8-hour average ozone is forecast to exceed 80 ppb. If triggered a second time, the forecast threshold would be reduced to 75 ppb

¹² South Coast AQMD, Final Staff Report for Proposed Amended Rule 445 – Wood-Burning Devices, October 27, 2020. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2020/2020-oct27-001.pdf?sfvrsn=2>

and, upon a third triggering, to 70 ppb. Each contingency measure would increase the number of “No-Burn” days, thereby reducing VOC emissions. Table 3-1 presents the VOC reductions that would result from each ozone contingency measure triggered. These reductions were estimated in 2020 as part of the rule amendment.¹³

TABLE 3-1
VOC REDUCTIONS (TONS PER YEAR) BY RULE 445 OZONE CURTAILMENT THRESHOLD IN THE SOUTH COAST AIR BASIN

Contingency	Upon Triggering 1 st Contingency Measure	Upon Triggering 2 nd Contingency Measure	Upon Triggering 3 rd Contingency Measure
Forecast Threshold	80 ppb	75 ppb	70 ppb
VOC Reductions	22.38	46.10	88.43

Rule 463

Rule 463 – Organic Liquid Storage reduces VOC emissions from tanks that store organic liquids. It applies to above-ground stationary tanks with a capacity of 75,000 liters (19,815 gallons) or more used to store organic liquids, above-ground tanks with a capacity between 950 liters (251 gallons) and 75,000 liters (19,815 gallons) that are used to store gasoline, and any stationary tank with a potential for VOC emissions of 6 tons per year or greater used in crude oil and natural gas production operations. Rule 463 requires applicable tanks to install controls based on tank type (e.g., fixed roof, internal floating roof, and external floating roof) and partially implements the following control measures from previous AQMPs:

- FUG-03 – Further Reductions of Fugitive VOC Emissions in the 2012 AQMP
- FUG-01 – Improved Leak Detection and Repair in the 2016 AQMP
- FUG-01 – Improved Leak Detection and Repair in the 2022 AQMP

These control measures focus on enhanced Leak Detection and Repair (LDAR) through advanced technologies, including optical gas imaging (OGI), as a method to reduce emissions from leaks.

In June 2024, Rule 463 was amended to include an ozone contingency measure for the 2008 and 2015 8-hour ozone standards. If triggered, the contingency measure would increase OGI inspection frequencies of storage tanks that contain organic liquids with a True Vapor Pressure of 5.0 pounds per square inch. Triggering the contingency measure in the South Coast Air Basin would result in an estimated additional 2,038 pounds per year of VOC reductions.¹⁴

¹³ Ibid.

¹⁴ South Coast AQMD, Final Staff Report for Proposed Amended Rule 463 – Organic Liquid Storage, June 2024.
<http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-Jun7-025.pdf?sfvrsn=6>

Rule 1173

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants controls VOC leaks from components and releases from atmospheric process pressure relief devices. This rule applies to refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants, and pipeline transfer stations. Rule 1173 was amended in November 2024 to implement the Wilmington, Carson, West Long Beach Community Emission Reductions Plan and the 2022 AQMP Control Measure FUG-01: Improved Leak Detection and Repair.

The November 2024 rule amendment also included three ozone contingency measures for the 2008 and 2015 8-hour ozone standards.¹⁵ The contingency measures would be implemented sequentially. If triggered, the first contingency measure would reduce the leak threshold of pumps from 400 ppm to 300 ppm. The second contingency measure would increase the frequency of OGI inspections from monthly to every two calendar weeks. Triggering the third contingency measure would reduce the leak threshold for valves, fittings, and other devices from 100 ppm to 50 ppm. If all triggered, these three contingency measures are expected to further reduce VOC emissions by 217.9 tons per year or 0.60 tons per day. Table 3-2 summarizes the VOC reductions that would result from each contingency measure triggered under Rule 1173.¹⁶

TABLE 3-2
VOC REDUCTIONS (TONS PER YEAR) BY RULE 1173 TRIGGER MECHANISM IN THE SOUTH COAST AIR BASIN

Contingency	Upon Triggering 1 st Contingency Measure	Upon Triggering 2 nd Contingency Measure	Upon Triggering 3 rd Contingency Measure
VOC Reductions	8.7	42.8	166.4

¹⁵ South Coast AQMD, Final Staff Report for Proposed Amended Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, November 2024.

<https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-Nov1-022.pdf?sfvrsn=6>

¹⁶ Ibid.

Comparison to OYW of Reductions

Table 2-3 in Chapter 2 presents One Year's Worth (OYW) of reductions, which are 2.63 tpd and 3.52 tpd, respectively, for NO_x and VOC. Table 3-3 below shows the cumulative NO_x and VOC reductions for triggering the first, second, and third contingency measures within each rule or measure. The reductions from CARB's smog check contingency measure, described in detail in Appendix A: California Smog Check Contingency Measure State Implementation Plan Revision, are listed as well.

TABLE 3-3
REDUCTIONS FROM CONTINGENCY MEASURES IN THE SOUTH COAST AIR BASIN

	1 st Contingency Measure		2 nd Contingency Measure		3 rd Contingency Measure	
	VOC reductions (tpd)	NO _x reductions (tpd)	VOC reductions (tpd)	NO _x reductions (tpd)	VOC reductions (tpd)	NO _x reductions (tpd)
Rule 445	0.06	-	0.13	-	0.24	-
Rule 463	<0.01	-	-	-	-	-
Rule 1173	0.02	-	0.12	-	0.46	-
California Smog Check Contingency Measure	0.08	0.25	0.08*	0.25*	-	-
Total Reductions	0.16	0.25	0.33	0.25	0.70	0.00

*CARB did not explicitly quantify reductions associated with triggering the 2nd contingency measure, but they are expected to be similar to the reductions associated with the 1st contingency measure.

South Coast AQMD and CARB's contingency measures achieve VOC and NO_x reductions that are surplus to the attainment strategy, although they do not achieve OYW of VOC or NO_x reductions. Therefore, pursuant to U.S. EPA's guidance, Chapter 4 presents the infeasibility justification that no further opportunity for contingency measures exists in the South Coast Air Basin.

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CHAPTER 4: INFEASIBILITY JUSTIFICATION

Reasoned Justification for Contingency Measures Achieving Less than One Year's Worth of Progress

This chapter contains evaluation of all VOC and NO_x stationary source categories in the South Coast Air Basin (Basin) and associated control measures. Tables 2-1 and 2-2 in Chapter 2 list the 2018 and 2037 summer planning emissions of VOC and NO_x, respectively, reported in tons per day (tpd) and as percentages of the Basin total inventory by Major Source Category (MSC). However, the evaluation presented in this chapter focused on all stationary sources at the Emissions Inventory Code (EIC) level. The EIC level inventory identifies further details such as fuel, equipment, and process type in each MSC.

As shown in Table 2-2, mobile source categories (i.e., MSCs 710 through 890) comprise nearly 80 percent of the 2037 summer planning NO_x emissions in the Basin. While CARB has unique authority to regulate certain mobile sources by obtaining a waiver from U.S. EPA, significant mobile source categories such as aircraft, ships, locomotives, and inter-state trucks lie under primarily federal regulatory authority. It is important to note that U.S. EPA is not obligated to evaluate contingency measures for sources under its authority even though these emission sources account for 85 tpd of NO_x in 2037, exceeding the maximum allowable NO_x emissions needed to meet the 2015 8-hour ozone standard. Furthermore, the dominance of mobile source NO_x emissions significantly limits the ability for South Coast AQMD to achieve the recommended amount of emission reductions from contingency measures specified in U.S. EPA's guidance.¹⁷

The following sections evaluate potential measures by source category and demonstrate that all feasible opportunities for contingency measures, beyond those already committed for the 2015 8-hour ozone standard, have been exhausted. As part of this evaluation, control measures implemented by other jurisdictions are reviewed and compared with the applicable rules adopted by South Coast AQMD. If the evaluation reveals an area where South Coast AQMD's rules are less stringent than those of other jurisdictions, a potential contingency measure is identified and subjected to further analysis to assess feasibility. This evaluation included control measures adopted by December 2024.

Fuel Combustion

Fuel combustion emissions are shown in Table 4-1 and consist of nine MSCs including 010 – Electric Utilities, 020 – Cogeneration, 030 – Oil and Gas Production (Combustion), 040 – Petroleum Refining (Combustion), 050 – Manufacturing and Industrial, 052 – Food and Agricultural Processing, 060 – Service and Commercial, 099 – Other (Fuel Combustion), and 610 – Residential Fuel Combustion. Staff examined VOC and NO_x emissions by equipment category rather than source category because the analysis of feasible contingency measures is anticipated to be similar across each combustion source category. That

¹⁷ U.S. EPA, *Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter*. December 3, 2024. https://www.epa.gov/system/files/documents/2024-12/cmtf-final-guidance-signature-version-11-22-24_clean_0.pdf

is, the technologies available to minimize emissions from fuel combustion in each source category are predicted to be more dependent on the equipment combusting fuel than on the type of source generating the emissions.

As demonstrated in Table 4-1, fuel combustion sources account for 6.40 tpd of VOC and 37.78 tpd of NOx in the 2037 baseline emissions inventory. The analysis of fuel combustion equipment was grouped into five categories: (1) boilers, stream generators, and process heaters; (2) engines; (3) combustion turbines; (4) residential and commercial fuel combustion; and (5) other fuel combustion. Each source group is analyzed below.

TABLE 4-1
FUEL COMBUSTION SOURCE CATEGORY EMISSIONS BASED ON 2037 SUMMER PLANNING
INVENTORY

Industry	VOC (tpd)	NOx (tpd)
010 – Electric Utilities	0.27	2.57
020 – Cogeneration	0.01	0.02
030 – Oil and Gas Production (Combustion)	0.19	0.97
040 – Petroleum Refining (Combustion)	1.38	3.90
050 – Manufacturing and Industrial	0.93	7.87
052 – Food and Agricultural Processing	0.05	0.40
060 – Service and Commercial	2.04	10.00
099 – Other (Fuel Combustion)	0.69	2.66
610 – Residential Fuel Combustion	0.84	9.39
Total	6.40	37.78

1. Boilers, Steam Generators, and Process Heaters

a. Overview

Boilers, steam generators, and process heaters are used to produce hot water, produce steam, and transfer heat from combustion to liquid or process streams. These units emit VOC and NOx from fuel combustion and can be found at facilities representing a wide range of industries including, but not limited to, electrical utilities, cogeneration, oil and gas production, petroleum refining, manufacturing and industrial, food and agricultural processing, and service and commercial facilities as shown in Table 4-2. These units have significant variability in technology, size, use and age of equipment, as well as variability in potential controls for various pollutants, the affected industries, and the regulatory requirements.

TABLE 4-2
BOILERS, STEAM GENERATORS, AND PROCESS HEATERS EMISSIONS BASED ON 2037 SUMMER
PLANNING INVENTORY

Industry	VOC (tpd)	NOx (tpd)
010 – Electric Utilities	0.06	0.48
020 – Cogeneration	0.00	0.00
030 – Oil and Gas Production (Combustion)	0.04	0.08
040 – Petroleum Refining (Combustion)	0.82	3.35
050 – Manufacturing and Industrial	0.18	1.26
052 – Food and Agricultural Processing	0.04	0.31
060 – Service and Commercial	0.13	1.04
099 – Other (Fuel Combustion)	0.00	0.00
610 – Residential Fuel Combustion	0.00	0.00
Total¹	1.26	6.52

¹Values may not sum due to rounding.

b. Evaluation

i. Available Control Technologies

Low NOx burners (LNB) and ultra-low NOx burners (ULNB), as well as flue gas recirculation (FGR), are commonly used combustion control technologies that manage NOx emissions in boilers, steam generators, and process heaters. The most popular post-combustion add-on control method is selective catalytic reduction (SCR). With ULNB, emission limitations of 7 to 9 parts per million (ppm)¹⁸ are often feasible to achieve. Current units burning gaseous fuels can achieve a 9 ppm NOx limit with ULNB and meeting 7 ppm is potentially possible with burner replacements.¹⁹ Operators often utilize SCR to attain an emissions limit of 5 ppm or below. There are emerging technologies that have demonstrated achieving 5 ppm and lower without the use of SCR and these include ULNB for boilers smaller than 20 million British thermal units per hour (MMBtu/hr).²⁰

ii. South Coast AQMD Control Measures

Table 4-3 summarizes South Coast AQMD control measures for boilers, steam generators, and process heaters.

¹⁸ All ppm emission limits are referenced at 3 percent volume stack gas oxygen (O₂) on a dry basis averaged over a period of 15 consecutive minutes.

¹⁹ South Coast AQMD, Final Staff Report for PARs 1146, 1146.1 and 1146.2, and PR 1100, December 2018.

<https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2018/2018-dec7-028.pdf?sfvrsn=6>

²⁰ John Zink Hamworthy SOLEX™ Burner: <https://www.johnzinkhamworthy.com/wp-content/uploads/solex-burner.pdf>. Accessed on September 27, 2023.

TABLE 4-3
SOUTH COAST AQMD CONTROL MEASURES (BOILERS, STEAM GENERATORS, AND PROCESS HEATERS)

South Coast AQMD Rule	Applicability	Control Measure
Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (Amended 10/4/24)	Electric generating units at electricity generating facilities.	Boilers must achieve 5 ppm NO _x at 3% O ₂ .
Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 12/4/20)	Boilers, steam generators, and process heaters of equal to or greater than 5 MMBtu/hr rated input capacity used in all industrial, institutional, and commercial operations	The various limits in the rule apply to different types of units based on use and size but can be achieved using the following control technologies: LNB, ULNB, SCR
Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 12/7/18)	Boilers, steam generators, and process heaters that are greater than 2 MMBtu/hr and less than 5 MMBtu/hr rated heat input capacity used in any industrial, institutional, or commercial operation	The various limits in the rule apply to different types of units based on use and size but can be achieved using the following control technologies: LNB, ULNB
Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters (Amended 6/7/24)	Natural gas-fired water heaters, boilers, and process heaters that are between 0.075 and 2 MMBtu/hr	The various limits in the rule apply to different types of units based on use and size. Includes a zero emission NO _x limit for new installations of applicable large water heaters, small boilers, and process heaters based on future effective dates and for existing units after the unit reaches a specific age
Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations (Adopted 11/5/21)	Combustion equipment including, but not limited to, boilers and process heaters at petroleum refineries and facilities with related operations to petroleum refineries	The various limits in the rule apply to different types of units based on use and size but can be achieved using the following control technologies: LNB, ULNB, SCR

iii. Review of Control Measures in Other Jurisdictions

To find potential measures to consider as contingency measures, staff evaluated the control measures in place in other California jurisdictions such as San Joaquin Valley Air Pollution Control District (SJVAPCD) and Ventura County APCD (VCAPCD) that regulate boilers, steam generators, and process heaters. These rules are not structured identically across agencies or rules, which can make direct comparison difficult. For example, subcategories are organized differently among the rules. Table 4-4 summarizes the

applicable control measures identified in other jurisdictions. In the table, two South Coast AQMD rules for boilers, steam generators, and process heaters – Rules 1135 and 1146 – are compared with SJVAPCD Rules 4306 and 4320 and VCAPCD Rule 74.15. For the purpose of comparison, source category numbering follows the format used in SJVAPCD Rule 4320.

Boilers, steam generators, and process heaters permitted to operate in the Basin are sources of NO_x emissions. Most of these units are installed with ULNB and/or SCR and they exclusively burn natural gas. South Coast AQMD Rule 1146 is more stringent than VCAPCD Rule 74.15, but is less stringent than SJVAPCD Rules 4306 and 4320 for some of the unit categories listed below:

- Category A1 (fire tube boilers rated > 5 MMBtu/hr and ≤ 20 MMBtu/hr)
 - Rule 4320 limit: 5 ppm
 - Rule 1146 limit: 7 ppm
- Category A3 (units fired on digester gas rated > 5 MMBtu/hr and ≤ 20 MMBtu/hr)
 - Rules 4306 and 4320 limits: 9 ppm
 - Rule 1146 limit: 15 ppm
- Category A4 (thermal fluid heaters rated > 5 MMBtu/hr and ≤ 20 MMBtu/hr)
 - Rules 4306 and 4320 limits: 9 ppm
 - Rule 1146 limit: 12 ppm
- Category A5 (all other units rated > 5 MMBtu/hr and ≤ 20 MMBtu/hr)
 - Rule 4320 limit: 5 ppm
 - Rule 1146 limit: 9 ppm
- Categories B (B1, B2, and B3 – boilers rated > 20.0 MMBtu/hr and ≤ 75 MMBtu/hr)
 - Rule 4320 limit: 2.5 ppm
 - Rule 1146 limit: 7 ppm for B1 (20 to 75 MMBtu/hr) and 5 ppm for B2 (20 to 75 MMBtu/hr) and B3 (> 75 MMBtu/hr)
- Category C1 (oilfield steam generator rated > 5.0 MMBtu/hr and ≤ 20.0 MMBtu/hr)
 - Rule 4320 limit: 6 ppm
 - Rule 1146 limit: 9 ppm
- Category C2 (units rated > 20 MMBtu/hr and ≤ 75 MMBtu/hr)
 - Rule 4320 limit: 5 ppm
 - Rule 1146 limit: 9 ppm
- Category D3 (refinery boilers rated >110 MMBtu/hr)
 - Rule 4320 limit: 2.5 ppm
 - Rule 1109.1 limit: 9 ppm
- Category D4 (refinery process heaters rated > 5.0 MMBtu/hr and ≤ 40.0 MMBtu/hr)
 - Rule 4320 limit: 5 ppm
 - Rule 1109.1 limit: 9 ppm
- Category D6 (refinery process heaters rated >110 MMBtu/hr)
 - Rule 4320 limit: 2.5 ppm
 - Rule 1109.1 limit: 5 ppm

SJVAPCD Rule 4320 includes technology forcing NO_x limits. For example, for categories A1 (5 ppm), B1 (2.5 ppm), C1 (6 ppm), and C2 (5 ppm), very few units have achieved these NO_x limits in the SJVAPCD. As of 2020, only 2 percent of 550 units (i.e., 11 units) in these categories were permitted to comply with these NO_x limits.²¹ Another example is for categories B2 (2.5 ppm), B3 (2.5 ppm), D3 (2.5 ppm), D4 (5 ppm), and D6 (2.5 ppm). These NO_x limits have not been demonstrated to be achievable in practice for large scale applications. Because of these technological challenges, Rule 4320 allows operators to pay a compliance fee in lieu of meeting the technology forcing limits until such limits are proven to be feasible in practice. This contrasts with the limits in South Coast AQMD's rules which are mandatory and do not offer fee based alternative compliance options.

South Coast AQMD Rule 1146 establishes NO_x limits for existing boiler, steam generator and process heater units which have been demonstrated to be achieved in practice. The current NO_x limits for gaseous fuel fired units, excluding digester and landfill gases and fire-tube boilers, with a rated heat input capacity between 5 and 75 MMBtu/hr is 9 ppm in Rule 1146. Based on vendor discussion, NO_x emissions at a level of 7 ppm or lower are feasible only with ULNB replacement and new installation. The source test results also showed that it is technically feasible for existing Rule 1146 units (between 5 and 75 MMBtu/hr) to achieve an emission limit of 7 ppm or less with burner replacements. Achieving a 5 ppm NO_x limit usually requires the use of SCR. SCR systems are generally utilized for units greater than 10 MMBtu/hr. Although it is theoretically feasible, there are several practical limitations impacting the ability of SCR retrofits to meet 4 ppm or less, such as the age, flow, and size of the catalyst bed of the existing SCR system. The most significant constraint is the inadequate safety margin between the permitted limit and the actual emissions to account for fluctuations in external factors such as ambient temperature or fuel heat input. Due to those limitations, it would not be technologically feasible for SCR retrofits to achieve the lower NO_x emission limit (e.g., 2.5 ppm).²²

The NO_x emission limit for thermal fluid heaters in Rule 1146 is 12 ppm. Thermal fluid heaters use water as the heating fluid and typically operate at much higher temperatures than process heaters, which results in higher NO_x emissions. ULNB replacement for existing units could meet a 12 ppm NO_x limit at the time of rule development, while an emission limit of 9 ppm is available for new units of certain applications. Based on the assumptions of 10 to 90 percent operating capacity of the thermal fluid heaters at different heat capacity sizes, lowering the emission limit from 12 ppm to 9 ppm for existing units would cost \$58,000 to \$523,000 per ton of NO_x reduced.²³ Due to high cost-effectiveness, the 9 ppm NO_x emission limit is considered not feasible.

²¹ SJVAPCD, Final Staff Report, "Proposed Amendment to Rule 4306 (Boilers, Steam Generators, and Process Heaters - Phase 3) Proposed amendments to Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater Than 5.0 MMBtu/hr)," December 17, 2020, Appendix B: Emissions Reduction Analysis ("Boilers Staff Report: Appendix B")

²² South Coast AQMD, Final Staff Report for PARs 1146, 1146.1 and 1146.2, December 2018.

<http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2018/2018-dec7-028.pdf?sfvrsn=6>

²³ South Coast AQMD, 2022 Air Quality Management Plan, Attachment VI-A-1B to Appendix VI, December 2, 2022.

<https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/appendix-vi.pdf?sfvrsn=12>

The NO_x emission limit for digester gas fired units in Rule 1146 is currently 15 ppm. In addition, South Coast AQMD Rule 1179.1 applies to boilers located at publicly owned treatment works (POTW) facilities and contains an identical 15 ppm NO_x limit for digester gas fired units greater than 2 MMBtu/hr. Based on discussion with vendors, digester gas fired units can be guaranteed to meet 12 ppm while 9 ppm is dependent on fuel composition and heating value which can vary depending on facility. NO_x concentration limits below 7 ppm are not feasible due to the presence of hydrogen sulfide (H₂S). Lowering NO_x emissions in digester gas fired units might also cause an increase in carbon monoxide (CO) emissions.

Rule 1109.1 NO_x limits are 5 ppm with an interim limit of 7.5 ppm for refinery boilers and process heaters with rated heat input greater than 110 MMBtu/hr. For boilers greater than 110 MMBtu/hr, the class and category are cost-effective for all units to meet the 5 ppm NO_x limit; however, a couple of units were operating near the 5 ppm limit with very high cost-effectiveness (more than \$200,000 per ton reduced). Five units were also operating at less than 7.5 ppm with potential emission reductions of 0.02 tpd at a cost of nearly \$20 million. Refinery boiler and heater's NO_x limits in Rule 1109.1 are less stringent than SJVAPCD's technology forcing limits in Rule 4320; however, as stated earlier in this section, it would be technologically infeasible to achieve the 2.5 ppm NO_x limit in practice. In addition, Rule 1109.1 is, overall, more stringent than SJVAPCD Rule 4320, as it applies to a larger and more diverse equipment universe. For example, Rule 1109.1 regulates NO_x emissions from fluidized catalytic cracking units (FCCUs) and coke calciners, while staff was not able to identify any SJVAPCD rule regulating these sources.

The implementation timeline is an additional consideration regarding the feasibility of the lower NO_x limits discussed in this section. Achieving these limits would potentially require single stage SCR, two stage SCR systems, or next generation ULNB combined with SCR. These emission control technologies require complex retrofits or full unit replacement and require significantly longer than two years to implement. For this reason, South Coast AQMD rules typically provide more than three years for operators to install these technologies to comply with lower emission limits.²⁴ It is also worth noting that some heaters are incompatible with some of these control technologies (e.g., two stage SCR systems) due to space limitations.

²⁴ U.S. EPA similarly concluded that tighter limits for this source category are infeasible as a contingency measure due to SCR units requiring more than two years to install in its recently proposed Contingency Measures for Fine Particulate Matter Standards for San Joaquin Valley. U.S. EPA, Clean Air Plans; Contingency Measures for the Fine Particulate Matter Standards; San Joaquin Valley, California, 88 Fed. Reg. 88008 (December 20, 2023). <https://www.federalregister.gov/documents/2023/12/20/2023-27686/clean-air-plans-contingency-measures-for-the-fine-particulate-matter-standards-san-joaquin-valley#page-88008>

TABLE 4-4
COMPARISON OF EXISTING CONTROL REQUIREMENTS (BOILERS, STEAM GENERATORS, AND PROCESS HEATERS)

Rule Element	South Coast AQMD Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 12/4/20)	SJVAPCD Rule 4306 – Boilers, Steam Generators, and Process Heaters (Amended 12/17/20)	SJVAPCD Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr (Amended 12/17/20)	VCAPCD Rule 74.15 – Boilers, Steam Generators and Process Heaters (Amended 9/10/24)
Applicability	Boilers, steam generators, and process heaters of equal to or greater than 5 MMBtu/hr rated input capacity used in all industrial, institutional, and commercial operations	Gaseous or liquid fuel fired boilers, steam generator, or process heater with a total rated heat input greater than 5 MMBtu/hr	Gaseous or liquid fuel fired boilers, steam generator, or process heater with a total rated heat input greater than 5 MMBtu/hr	Portable and stationary boilers, steam generators, and process heaters fired on any gaseous fuel or liquid fuel with a rated heat input capacity equal to or greater than 5 MMBtu/hr, except for utility electric power generating units and any auxiliary boiler thereof and water heaters
A. Units with a total rated heat input > 5 MMBtu/hr to ≤ 20 MMBtu/hr, except for Categories C through G units				
A1. Fire Tube Boilers	7 ppm	7 ppm	5 ppm	9 ppm
A2. Units at Schools	9 ppm	9 ppm	9 ppm	9 ppm or 12 ppm
A3. Units fired on Digester Gas	15 ppm	9 ppm	9 ppm	15 ppm
A4. Thermal Fluid Heaters	12 ppm	9 ppm	9 ppm	9 ppm or 12 ppm
A5. All other units	9 ppm	9 ppm	5 ppm	9 ppm or 12 ppm
B. Units with a total rated heat input > 20 MMBtu/hr, except for Categories C through G units				

Rule Element	South Coast AQMD Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 12/4/20)	SJVAPCD Rule 4306 – Boilers, Steam Generators, and Process Heaters (Amended 12/17/20)	SJVAPCD Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr (Amended 12/17/20)	VCAPCD Rule 74.15 – Boilers, Steam Generators and Process Heaters (Amended 9/10/24)
B1. Fire Tube Boilers with a total rated heat input > 20.0 MMBtu/hr and ≤ 75 MMBtu/hr	7 ppm	7 ppm	2.5 ppm	9 ppm
B2. All other units with a total rated heat input > 20.0 MMBtu/hr and ≤ 75 MMBtu/hour	9 ppm for units with previous NOx limit ≤ 12 and > 5 ppm prior to 12/7/18 or 5 ppm	7 ppm	2.5 ppm	9 ppm or 12 ppm
B3. Units with a rated heat input > 75 MMBtu/hr	5 ppm	5 ppm	2.5 ppm	9 ppm or 12 ppm
E. Lower Use Units				
E1. Units limited by a Permit to Operate to an annual heat input of 9 billion Btu/year to 30 billion Btu/year “Low Use” (no more than 10 percent operating capacity)	- Operate units so stack is maintained with gas oxygen concentrations less than or equal to three percent on a dry basis for 15 min averaging period - Tune units at least twice a year or follow different tune up procedure	30 ppm	9 ppm * Units limited by a Permit to Operate to an annual heat input >1.8 billion Btu/year but < 30 billion Btu/year	- Operate units so stack is maintained with gas oxygen concentrations less than or equal to three percent on a dry basis for 15 min averaging period - Tune units at least twice a year or follow different tune up procedure
Liquid Fueled Units	40 ppm	40 ppm	40 ppm	40 ppm

c. Conclusion

Staff did not find any opportunity to accommodate contingency measures for this category of units due to technological and economic infeasibility and the implementation timeline limitations imposed by the U.S. EPA's guidance. South Coast AQMD's rules as well as regulations in other jurisdictions do not enforce VOC emission limits for boilers, steam generators, or process heaters. For NOx, staff considered several potential measures such as lower NOx limits using ULNB and SCR, but these were not suitable contingency measures considering that it would be technologically infeasible to design, install and operate advanced emission control technology within two years of the triggering event. This feasibility consideration is discussed in more detail in the evaluation section. A contingency measure that will not result in emission reductions until more than two years in the future would not satisfy the criteria of contingency measures as defined in the U.S. EPA's guidance.

2. Reciprocating Internal Combustion Engines (RICE)

a. Overview

A stationary RICE includes any internal combustion engine (ICE) which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICEs are used in a wide array of industries, including electricity generation (either as stand-alone generators or in cogeneration applications); oil and gas production; agriculture; and commercial/institutional settings (including as back-up electricity generators). NOx emissions are generated by engines combusting either gaseous or liquid fuels.

As summarized in Table 4-5, RICE account for 0.91 tpd of VOC and 9.37 tpd of NOx emissions in the 2037 baseline inventory.

TABLE 4-5
STATIONARY ENGINE EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Industry	VOC (tpd)	NOx (tpd)
010 – Electric Utilities	0.04	0.25
020 – Cogeneration	0.00	0.00
030 – Oil and Gas Production (Combustion)	0.07	0.85
040 – Petroleum Refining (Combustion)	0.01	0.02
050 – Manufacturing and Industrial	0.43	3.20
052 – Food and Agricultural Processing	0.01	0.08
060 – Service and Commercial	0.23	2.44
099 – Other (Fuel Combustion)	0.13	2.53
610 – Residential Fuel Combustion	0.00	0.00
Total¹	0.91	9.37

¹ Values may not sum due to rounding.

b. Evaluation

i. Available Control Technologies

Available control techniques for stationary engines vary by engine configuration and are summarized below. Each engine type produces emissions of NO_x and VOC at different rates and can have differing approaches for controlling emissions.

- Compression-ignition (CI) engines: CI engines are primarily diesel engines but could also be dual-fuel (diesel and natural gas) engines. NO_x can be controlled with either combustion controls (e.g., exhaust gas recirculation) and/or exhaust treatment such as SCR.
- Spark-ignition (SI) four-stroke rich-burn (4SRB) engines: 4SRB engines use natural gas as primary fuel. NO_x emissions are inherently lower from rich-burn engines compared to lean-burn and add-on controls include three-way catalysts (also known as non-selective catalytic reduction (NSCR)).
- SI four-stroke lean-burn (4SLB) engines: Natural gas is the primary fuel for 4SLB engines. NO_x emissions can be controlled by combustion techniques or exhaust controls, such as SCR.
- SI two-stroke lean-burn (2SLB) engines: 2SLB engines primarily use natural gas. Typically, combustion controls are applied to reduce NO_x, including layered combustion.²⁵

Existing federal regulations require manufacturers to certify stationary CI engines to the U.S. EPA's tiered engine requirements (Tiers 1-4, with Tier 4 being the most stringent).²⁶ Since 2014, new CI engines have been required to meet Tier 4 criteria except for engines qualifying as emergency engines which must be certified to Tier 2 or Tier 3 standards. However, U.S. EPA's requirements only apply to new engines and do not require owners/operators to replace older engines. U.S. EPA-certified Tier 4 engines are typically not required to install additional controls to meet Best Available Control Technology/Lowest Achievable Emission Rate (BACT/LAER) determinations for NO_x and VOC. A search of the Reasonably Available Control Technology (RACT)/BACT/LAER Clearinghouse (RBLC) did not identify "beyond Tier 4" restrictions for CI engines.

²⁵ In a layered or stratified charge arrangement: a pre-stratified control kit is applied that results in lower combustion temperatures and lower NO_x formation. Example technologies that could be considered layered stratification include turbochargers and inter-cooling, pre-chamber ignition or high energy ignition, improved fuel injection control, and air/fuel ratio control.

²⁶ Title 40, Code of Federal Regulations, Part 60 (40 CFR 60) Subparts III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-60/subpart-III> and Title 40, Code of Federal Regulations Part 1039 (40 CFR 1039) – Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-U/part-1039>

Existing federal regulations require stationary SI engines to meet emissions standards, but do not require U.S. EPA certification for all new SI engines.²⁷ Like CI engines, these regulations do not require owner/operators to replace older engines or upgrade engines to meet the most recent standards. However, to meet BACT/LAER determinations for NO_x, the addition of add-on NO_x controls is often required (e.g., SCR or an NSCR, depending on engine type).²⁸

ii. South Coast AQMD Control Measures

Table 4-6 summarizes South Coast AQMD rules and control measures that are applicable to stationary engines. In addition to rule requirements, South Coast AQMD requires that new or modified emergency backup generators with greater than or equal to 1,000 horsepower CI engines meet updated LAER and BACT guidelines which require that the units achieve U.S. EPA's Tier 4 Final emission standards.²⁹ Existing Tier 2 units can achieve Tier 4 Final NO_x emission limits through the use of SCR.

TABLE 4-6
SOUTH COAST AQMD RULE FOR RECIPROCATING ENGINES

South Coast AQMD Rule	Applicability	Emission Limits
Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines (Amended 11/3/23)	All stationary and portable engines over 50 rated brake horsepower (bhp)	
	Stationary ICE ≥ 50 bhp, including landfill and digester gas (i.e., biogas) fired engines	11 ppm NO _x 30 ppm VOC
	Stationary, low-use engines	36 ppm NO _x for ≥ 500 bhp 45 ppm NO _x for < 500 bhp 250 ppm VOC
	Stationary, low-use landfill or biogas fired engines	36 x ECF* ppm NO _x for ≥ 500 bhp, 45 x ECF ppm NO _x for < 500 bhp 40 ppm VOC (landfill gas) 250 x ECF ppm VOC (biogas)
	Stationary, non-emergency electrical generators	0.070 pounds per mega Watt-hour (lb/MWh) NO _x 0.10 lb/MWh VOC

* ECF is the efficiency correction factor and is no less than 1.0.

²⁷ Title 40, Code of Federal Regulations (CFR) Part 60 (40 CFR 60), Subpart JJJJ – [Standards of Performance for Stationary Spark Ignition Internal Combustion Engines](#)

²⁸ U.S. EPA, RACT/BACT/LAER Clearinghouse (RBLC) <https://cfpub.epa.gov/rblc/index.cfm?action=Search.BasicSearch&lang=en>

²⁹ South Coast AQMD, Proposed Amendments to BACT Guidelines, September 22, 2022. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2022/2022-sept2-030.pdf?sfvrsn=6You>

iii. Review of Control Measures in Other Jurisdictions

Table 4-7 compares and summarizes the applicable control measures in South Coast AQMD with the requirements in other jurisdictions including SJVAPCD, the Sacramento Metropolitan Air Quality Management District (SMAQMD), and the Maricopa County Air Quality Department (MCAQD). The statewide Air Toxics Control Measure (ATCM) for stationary CI engines is also evaluated.³⁰ South Coast AQMD's Rule 1110.2 requires most engines to meet 11 ppm and 30 ppm NOx and VOC emission limits, respectively. Some engines used in agricultural operations can be exempt from this requirement if a Tier 4 diesel engine is installed and other requirements are met. Overall, South Coast AQMD's Rule 1110.2 is designed to incentivize electrification and has the most stringent emission limits for stationary engines compared to other air districts.

³⁰ CARB, Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines, May 19, 2011. <https://ww2.arb.ca.gov/sites/default/files/classic/diesel/documents/finalreg2011.pdf>

TABLE 4-7
COMPARISON OF EXISTING CONTROL REQUIREMENTS (RECIPROCATING INTERNAL COMBUSTION ENGINES)

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
Applicability (Equipment, size, fuel type)	All stationary and portable engines rated >50 bhp	All internal combustion engines >50 bhp* * For non-agriculture operations (AO) engines >25 to ≤50 bhp, if non-certified, these may not be offered for sale.	Stationary IC engines rated >50 bhp located at major sources of NOx* * Major sources have potential to emit >25 tons per year (tpy)	Stationary IC engines >125 bhp used for cogeneration; located not at a major NOx source Stationary IC engines >50 bhp used for cogen not at a major NOx source if all engines aggregate to >125 bhp Stationary IC engines >50 bhp at major NOx sources Nonroad engines >125 bhp with potential to emit: 0.5 tpy PM2.5; 1.0 tpy NOx, 0.5 tpy VOC; or 1.0 tpy CO	All stationary diesel engines >50 bhp
Control Measures					
NOx emissions limit(s)	Stationary engines with approved emission control plan: 11 ppm	Non-AO SI engines by 12/31/2023: 1. Rich-burn: a. 11 ppm 2. Lean-burn:	SI rich-burn: 25 ppm or 90% control SI lean-burn: 65 ppm or 90% control	CI engines >250 bhp: 530 ppm CI engines >399 bhp: 550 ppm	Generally the same as EPA certified standards

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
	Other stationary engines without an emission control plan, biogas-fired: 11 ppm Limits for low-use engines*: • <500 bhp = 45 ppm • ≥500 bhp = 36 ppm * Low use engines <500 HOP/yr or 1 billion Btu/yr. Slightly higher limits are also applicable to landfill or biogas fired engines to account for efficiency Non-emergency electrical generators: 0.070 lb/MWh Note: agricultural and non-agricultural engines held to the same standards but different compliance schedules applied.	a. Gas compression engines: 40 ppm b. >50% waste gas: 40 ppm c. Others: 11 ppm AO SI Engines: • Rich-burn (by 12/31/23): 11 ppm or 0.15 g/bhp-hr • Lean-burn (by 12/31/29): 0.6 g/bhp-hr or 43 ppm Certified AO and non-AO compression-ignited (CI) engines (no later than 6/1/18): • EPA certified Tier 1 or 2: EPA Tier 4 • EPA certified Tier 3 or 4: CI standard in effect at time of installation Non-certified AO and non-AO CI engines (by 2011):	CI: 80 ppm or 90% control	(at major sources, all CI: 530 ppm) SI lean-burn: 110 ppm SI rich-burn: 20 ppm	

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
		• 50 – 500 bhp: EPA Tier 3 or Tier 4 • 500 – 750 bhp and <1000 annual HOP: EPA Tier 3 • >750 bhp and <1000 annual HOP: EPA Tier 4			
VOC Emission Limits	Stationary engines with approved emission control plan: 30 ppm Other stationary engines without an emission control plan, biogas-fired: 30 ppm Limit for low-use engines*: 250 ppm * Low use engines <500 HOP/yr or 1 billion Btu/yr. Slightly higher limits are also applicable to landfill or biogas fired engines to account for efficiency Non-emergency electrical generators: 0.10 lb/MWh	Non-AO SI engines by 12/31/2023: 1. Rich-burn: 90 ppm 2. Lean-burn: 90 ppm AO SI Engines by 12/31/2023: • Rich-burn: 90 ppm • Lean-burn: 90 ppm Certified AO and non-AO compression-ignited (CI) engines (no later than 6/1/18): • EPA certified Tier 1 or 2: EPA Tier 4 • EPA certified Tier 3 or 4: CI standard in effect at time of installation	SI rich-burn: 250 ppm SI lean-burn: 750 ppm CI: 750 ppm	CI engines >250 bhp: Not Applicable SI lean-burn: 800 ppm SI rich-burn: 800 ppm	Generally the same as EPA certified standards

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
	Note: agricultural and non-agricultural engines held to the same standards but different compliance schedules applied.	Non-certified AO and non-AO CI engines (by 2011): • 50 – 500 bhp: EPA Tier 3 or Tier 4 • 500 – 750 bhp and <1000 annual HOP: EPA Tier 3 • >750 bhp and <1000 annual HOP: EPA Tier 4			
Exemptions	• Engines powering orchard wind machines • Emergency standby engines, engines use for fire-fighting and flood control, and any other emergency engines limited to 200 hrs/yr • Laboratory engines • Engines used for performance testing • Auxiliary engines used to power other engines/turbines during start-ups	• Engines used to propel implements of husbandry • Engines used exclusively to power wind machines • Some de-rated AO and non-AO engines with de-rating before 6/1/2005 (below 50 bhp) • Engines powering mobile agricultural equipment • State-registered or Rule 2280 registered portable equipment engines	• Emergency standby engines • Engines used exclusively for agricultural purposes • Engine test stands • Engine control evaluations • Nonroad engines • Motor vehicle engines • Flight line engines • Low use engines: ○ SI: varies by engine size, range is 40-200 hrs/yr ○ CI: varies by engine size, range is 200-1,435 hrs/yr	• Emergency standby engines used for power, emergency services, sewage overflow • Compressed gas stationary RICE used for solar testing and research • Engine performance verification, including at the production facility • Engine development and testing • Flight line engines • Nonroad engines • Low use engines:	Some emergency engines not required to install particulate matter controls

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
	• Portable engines registered under state registration (Title 13, Article 5 of CCR) • Agriculture stationary engines that: ○ cannot get electrical service or operator does not qualify for state funding under CA Health and Safety Code Section 44229; and ○ are replaced with Tier 4 replacement engines; and ○ do not operate the Tier 4 engines in a manner to exceed the not-to-exceed standards of 40 CFR Part 1039 Section 1039.101(e) • Some additional exemptions also apply	• Emergency standby or low use engines • Public safety equipment		○ Engines ≤1000 bhp operating <200 hrs/yr ○ Engines >1000 bhp operating <100 hrs/yr	

South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS

Rule Element	South Coast AQMD Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines (Amended 11/3/23)	SJVAPCD Rule 4702 – Internal Combustion Engines (Amended 8/19/21)	SMAQMD Rule 412 – Stationary Internal Combustion Engines Located at Major Sources of NOx (Adopted 6/1/95)	Maricopa County, AZ Rule 324 – Stationary Reciprocating Internal Combustion Engines (RICE) (Amended 6/23/21)	CA ATCM for Diesel Stationary Compression Ignition Engines (Amended 5/19/11)
NOx emissions compliance alternative	None listed	Payment of NOx emissions fee in lieu of meeting the emissions limits: sunsets 12/31/23 after which engines must meet limits for non-AO SI engines	None listed	None listed	None listed

c. Conclusion

Staff does not propose any contingency measures for stationary engines. Staff did not identify any more stringent emission limits in other districts' rules. While lower limits of NO_x could potentially be achieved by installing SCR, installing SCR and achieving reductions within two years of triggering would be technically and practically infeasible. Contingency measures should be measures that would result in emission reductions within a year after the triggering event, or within two years with proper justification. A contingency measure that will not result in emission reductions until further in the future would not satisfy the criteria of contingency measures as defined in the U.S. EPA's guidance.

3. Combustion Turbines

a. Overview

Industries operating in the Basin that use combustion turbines include the following: electric utilities; cogeneration; oil and gas production; petroleum refining; and commercial operations. Most often, combustion turbines are used to generate power for supplying the electrical grid or for onsite use. Natural gas and diesel/distillate oil are the most common fuels combusted; however, according to the emissions inventory, other fuels used in the Basin include landfill gas, refinery gas, and process gas.

As summarized in Table 4-8 by industry, combustion turbines account for 0.87 tpd of VOC and 2.83 tpd of NO_x emissions in the 2037 baseline inventory.

**TABLE 4-8
COMBUSTION TURBINE EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Industry	VOC (tpd)	NO _x (tpd)
010 – Electric Utilities	0.17	1.84
020 – Cogeneration	0.00	0.01
030 – Oil and Gas Production (Combustion)	0.09	0.05
040 – Petroleum Refining (Combustion)	0.50	0.38
050 – Manufacturing and Industrial	0.02	0.08
052 – Food and Agricultural Processing	0.00	0.00
060 – Service and Commercial	0.10	0.47
099 – Other (Fuel Combustion)	0.00	0.00
610 – Residential Fuel Combustion	0.00	0.00
Total¹	0.87	2.83

¹ Values may not sum due to rounding.

The most common fuels used to generate power in the combustion turbine category are natural gas, landfill gas, process gas, and refinery gas. Electric utilities account for over 60 percent of the category total NO_x emissions, and natural gas is the dominant fuel combusted in electric utility turbines taking up about 80 percent of NO_x emissions. Service and commercial and petroleum refining are the second and third largest categories of NO_x emissions for combustion turbines, respectively. For the service and commercial

sector, NO_x emissions are greatest from landfill gas-fired turbines, while combustion of process and refinery gases combined is the dominant (over 80 percent) source of NO_x emissions from turbines for petroleum refining because refinery fuel gas (RFG) burns at higher temperatures and thus can increase NO_x emissions compared to turbines burning natural gas. For example, dry low NO_x (DLN) combustors can have approximately 10 percent more NO_x emissions when operating on refinery gas compared to natural gas.

Control of NO_x from combustion turbines can be accomplished using combustion controls, such as water or steam injection DLN and ULNB, or post-combustion controls, including SCR.³¹ DLN combustors can achieve between 9 ppm and 25 ppm in gas turbines operating with natural gas and between 10 ppm and 27.5 ppm in gas turbines operating on refinery gas. SCR can achieve about 95 percent NO_x reduction in both types of gas turbines. It is common for both control technologies to be applied (e.g., DLN + SCR + oxidation catalyst). DLN and SCR, when combined, can achieve 2 ppm NO_x with proper engineering and design.

b. Evaluation

In the Basin, emissions from combustion turbines are regulated by Rules 1134, 1135, and 1109.1. Rule 1109.1 regulates NO_x emissions from turbines located at petroleum refineries. Rule 1134 establishes limits for NO_x emissions based on unit size (0.3 MW and greater) and fuel type (gas or oil). The rule has different compliance limits through the end of 2023 by unit size and has varied emission limits on and after January 1, 2024 by fuel type. Rule 1135 establishes 2 ppm and 2.5 ppm NO_x limits for combined cycle and simple cycle gas turbines, respectively, at electricity generating facilities. Rule 1135 was recently amended to incorporate new NO_x emission caps for electric generating units (EGUs) located on Santa Catalina Island. The emission limits under Rules 1134, 1135, and 1109.1 are further detailed in Table 4-9. All emission limits are expressed on a dry volume basis, corrected to 15 percent O₂.

³¹ Sargent & Lundy, L.L.C. prepared for Eastern Research Group, Inc., Combustion Turbine NO_x Control Technology Memo, January 2022. <https://www.epa.gov/system/files/documents/2022-03/combustion-turbine-nox-technology-memo.pdf>

TABLE 4-9
SOUTH COAST AQMD RULES FOR COMBUSTION TURBINES

Rule	Applicability	Control Measure
Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines (Amended 2/4/22)	All stationary gas turbines, 0.3 MW and greater, excluding units subject to Rules 1135 and 1109.1	NOx emission limits are identified below by unit size (MW rating) and by fuel type. <u>Beginning 1/1/2024:</u> • Liquid fuel turbines on outer continental shelf (OCS): 30 ppm • Natural gas - combined cycle/cogeneration turbine: 2 ppm • Natural gas - simple cycle: 2.5 ppm • Produced gas: 9 ppm • Produced gas - OCS turbines: 15 ppm • Other (including recuperative gas turbines): 12.5 ppm • Natural gas - compressor gas turbines: 3.5 ppm
Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (Amended 10/4/24)	Electric generating units at electricity generating facilities	Combined cycle gas turbines and associated duct burners: 2 ppm Simple cycle gas turbines: 2.5 ppm A declining NOx emissions cap of 45 tpy by 2027 to 6 tpy by 2035 for EGUs at Santa Catalina Island
Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations (Adopted 11/5/21)	Units at petroleum refineries	Gas turbines fueled with natural gas: 2 ppm Gas turbines fueled with gaseous fuel other than natural gas: 3 ppm

Staff examined stationary gas turbine rules in other California air districts as well as the RBLC for comparison to Rules 1134, 1135, and 1109.1, as summarized in Table 4-10.

**TABLE 4-10
COMPARISON OF EXISTING CONTROL REQUIREMENTS FOR GAS TURBINES**

Source Category	South Coast AQMD Rules 1134, 1135, and 1109.1	SJVAPCD Rule 4703 – Stationary Gas Turbines (Amended 9/20/07)	BAAQMD Rule 9-9 – Nitrogen Oxide from Stationary Gas Turbines (Amended 12/6/06)	RACT/BACT/LAER Clearinghouse (RBLC)
<3 MW: gas fuel	Rules 1134/1135: 2.5 ppm (simple cycle NG) Rule 1134: 9 ppm (PG) 12.5 ppm (other) Rule 1109.1: 2 ppm (NG) 3 ppm (other gaseous fuel)	9 ppm	<0.5 MW units: exempt 42 ppm (natural gas) 50 ppm (RFG, WG, LPG)	2 ppm (<25 MW non-EGU NG)
<3 MW: liquid fuel	^	25 ppm	<0.5 MW units: exempt 65 ppm	-
3-10 MW pipeline turbine: gas fuel*	Rule 1134: 3.5 ppm (gas compressors)	8 ppm	25-42 ppm (NG) 50 ppm (RFG, WG, LPG)	2 ppm (<25 MW non-EGU NG)
3-10 MW pipeline turbine: liquid fuel	^	25 ppm	65 ppm	-
3-10 MW other turbines (<877 hr/yr): gas fuel	Rule 1134/1135: 2.5 ppm (simple cycle NG) Rule 1134: 9 ppm (PG) 12.5 ppm (other) Rule 1109.1: 2 ppm (NG) 3 ppm (other gaseous fuel)	9 ppm	25-42 ppm (NG) 50 ppm (RFG, WG, LPG)	2 ppm (<25 MW non-EGU NG)
3-10 MW other turbines (<877 hr/yr): liquid fuel	^	25 ppm	65 ppm	-
3-10 MW other turbines (>877 hr/yr): gas fuel	Rule 1134/1135: 2.5 ppm (simple cycle NG)	5 ppm	25-42 ppm (NG) 50 ppm (RFG, WG, LPG)	2 ppm (<25 MW non-EGU NG)

Source Category	South Coast AQMD Rules 1134, 1135, and 1109.1	SJVAPCD Rule 4703 – Stationary Gas Turbines (Amended 9/20/07)	BAAQMD Rule 9-9 – Nitrogen Oxide from Stationary Gas Turbines (Amended 12/6/06)	RACT/BACT/LAER Clearinghouse (RBLCL)
	Rule 1134: 9 ppm (PG) 12.5 ppm (other)			
3-10 MW other turbines (>877 hr/yr): liquid fuel	^	25 ppm	65 ppm	-
>10 MW simple cycle (<200 hr/yr): gas fuel	Rule 1134/1135: 2.5 ppm (simple cycle NG) Rule 1109.1: 2 ppm (NG) 3 ppm (other gaseous fuel)	25 ppm	15 ppm (15 to 25 MW) 9 ppm (>25 to 50 MW) 5 ppm (>50 MW NG) 9 ppm (>50 MW RFG, WG)	2 ppm (>25 MW)
>10 MW simple cycle (<200 hr/yr): liquid fuel	^	42 ppm	42 ppm (15 to 25 MW) 25 ppm (>25 MW)	4 ppm (>25 MW EGU, ULSD)
>10 MW simple cycle (>200 hr/yr): gas fuel	Rule 1134/1135: 2.5 ppm (NG) Rule 1109.1: 2 ppm (NG) 3 ppm (other gaseous fuel)	5 ppm	15 ppm (15 to 25 MW) 9 ppm (>25 to 50 MW) 5 ppm (>50 MW NG) 9 ppm (>50 MW RFG, WG)	2 ppm (>25 MW)
>10 MW simple cycle (>200 hr/yr): liquid fuel	^	25 ppm	42 ppm (15 to 25 MW) 25 ppm (>25 MW)	4 ppm (>25 MW EGU ULSD)
>10 MW combined cycle/cogeneration: gas fuel	Rule 1134/1135: 2 ppm (NG) Rule 1109.1: 2 ppm (NG) 3 ppm (other gaseous fuel)	5 ppm (standard compliance) 3 ppm (enhanced compliance)	15 ppm (15 to 25 MW) 9 ppm (>25 to 50 MW) 5 ppm (>50 MW NG) 9 ppm (>50 MW RFG, WG)	2 ppm (>25 MW)
>10 MW combined cycle/cogeneration: liquid fuel	^	25 ppm	42 ppm (15 to 25 MW) 25 ppm (>25 MW)	4 ppm (>25 MW EGU ULSD)

Abbreviations: EGU – electricity generating unit; NG – natural gas; PG – process gas; RFG – refinery fuel gas; WG – waste gas; LPG – liquefied petroleum gas; ULSD – ultra-low sulfur diesel.

* 12 ppm is the limit under non-steady state operating conditions.

Source Category	South Coast AQMD Rules 1134, 1135, and 1109.1	SJVAPCD Rule 4703 – Stationary Gas Turbines (Amended 9/20/07)	BAAQMD Rule 9-9 – Nitrogen Oxide from Stationary Gas Turbines (Amended 12/6/06)	RACT/BACT/LAER Clearinghouse (RBLC)
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^ Rule 1134 disallows the use of liquid fuel in gas turbines except for units located in the outer continental shelf (OCS) or units providing emergency power to a health facility during a natural gas curtailment; Rule 1135 has similar provisions for EGUs during natural gas curtailment. NO_x limits during these periods are specified in the permit.

c. Conclusion

Staff compared South Coast AQMD's NOx emission limits for combustion turbines to those in other air districts, although there were no applicable VOC limits identified for comparison. South Coast AQMD's NOx emission limits are generally the most stringent compared to those in other districts' rules although their stringency varies relative to the RBLC. For example, the RBLC contains a slightly lower limit (2 ppm vs. 2.5 ppm) for non-EGU natural gas simple cycle turbines that are less than 25 MW. On the other hand, Rule 1135 is more stringent than the RBLC because it applies to all EGU turbines and requires NOx limits of 2 ppm and 2.5 ppm for combined and simple cycle turbines, respectively. Rule 1109.1 also requires a 2 ppm NOx limit for all natural gas turbines at refineries. Finally, lowering regulatory limits as a contingency measure would not be appropriate as affected sources would need to design and install advanced emission control technology such as SCR. This feasibility consideration is discussed in further detail in the evaluation section for boilers, steam generators, and process heaters. No contingency measures are proposed for combustion turbines as implementing potential measures within two years is not feasible.

4. Residential and Commercial Fuel Combustion

a. Overview

Source categories 060 – Service and Commercial and 610 – Residential Fuel Combustion consist of several subcategories, including wood combustion and fuel combustion (space heating, water heating, cooking, and other appliances, such as clothes dryers, barbecues, and water heaters used for pools, spas and hot tubs). Major source categories are comprised of combustion appliances or furnaces in commercial and residential buildings that typically burn natural gas. Table 4-11 summarizes VOC and NOx emissions from these sources in the 2037 baseline emissions inventory. Note that residential wood combustion is evaluated separately (see Miscellaneous Processes).

**TABLE 4-11
RESIDENTIAL AND COMMERCIAL FUEL COMBUSTION EMISSIONS BASED ON 2037 SUMMER
PLANNING INVENTORY**

Source Category	VOC (tpd)	NOx (tpd)
010 – Electric Utilities	0.00	0.00
020 – Cogeneration	0.00	0.00
030 – Oil and Gas Production	0.00	0.00
040 – Petroleum Refining – Space Heating	0.00	0.00
050 – Manufacturing and Industrial – Space Heating	0.00	0.05
052 – Food and Agricultural Processing – Space Heating	0.00	0.00
060-020: Service and Commercial – Space Heating (Natural Gas)	0.02	0.39
060-020: Service and Commercial – Space Heating (Liquid Petroleum Gas)	0.00	0.00
060-030: Service and Commercial – Water Heating	0.08	0.42
610-606: Residential Fuel Combustion – Space Heating (Natural Gas)	0.19	2.01
610-606: Residential Fuel Combustion – Space Heating (Distillate Oil)	0.00	0.10
610-608: Residential Fuel Combustion – Water Heating	0.35	1.78
610-606: Residential Fuel Combustion – Cooking	0.06	1.21
610-608: Residential Fuel Combustion – Other	0.23	4.29
Total	0.93	10.25

In the past, manufacturers of furnaces and water heaters have implemented combustion modifications to meet the NOx limits required in rules by South Coast AQMD and other jurisdictions. This was done using burner designs such as LNBs and ULNBs, incorporating design principles that include staged air burners, staged fuel burners, pre-mix burners, internal recirculation, and radiant burners.

As of April 2025, to follow through on commitments in the 2022 AQMP, South Coast AQMD is proposing to amend its rules to accelerate the transition to zero-emission space and water heaters. The proposed changes would require manufacturers of NOx-emitting units to gradually increase the share of zero-NOx appliances they sell, and pay mitigation fees for each NOx-emitting unit sold. Additionally, existing regulation (Rule 1146.2) requires that certain commercial water heaters must be replaced with zero-emission models once they have reached the end of their useful life. The evaluation presented below considers both on-the-books and on-the-way control measures, consistent with U.S. EPA’s guidance.

b. Evaluation

South Coast AQMD currently has three rules that regulate NOx emissions from residential and commercial water heating (Rules 1121 and 1146.2, respectively) and space heating (Rule 1111). Rule 1121 regulates NOx emissions from residential type, natural gas-fired water heaters with heat input rates less than 75,000 Btu/hr; Rule 1146.2 regulates NOx emissions from small boilers, process heaters, and water heaters including the commercial sector with heat input rates less than or equal to 2,000,000 Btu/hr. Rule 1111 regulates NOx emissions from natural gas-fired furnaces with a heat input rate less than 2,000,000 Btu/hr.

The emission limits for commercial water heaters in Rule 1146.2 are itemized in Table 4-12. Table 4-12 also considers the space and water heater emission limits in Proposed Amended Rules 1111 and 1121 as of April 2025.

TABLE 4-12
SOUTH COAST AQMD CONTROL MEASURES FOR SPACE AND WATER HEATERS

Rule	Applicability	Control Measure
Proposed Amended Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired Furnaces (Adoption TBD)	Natural-gas-fired furnaces used for interior space heating, with a rated heat input of <175,000 Btu/hr or a cooling rate of <65,000 Btu/hr for combination heating and cooling units	- Zero emission limits for new installations and existing units upon replacement after the zero emission compliance dates: - Residential Fan-Type Central Furnace (Condensing, Non-Condensing, and Weatherized Furnaces) - New Buildings: 1/1/27 - Existing Buildings, excluding mobile homes: 1/1/29 - Wall Furnaces and Floor Furnaces - New Buildings: 1/1/27 - Existing Buildings: 1/1/29 - Prior to zero emission compliance dates: 14 ng/joule for both condensing and non-condensing furnaces, weatherized furnaces, and mobile home furnaces - Mobile home furnace manufacturer alternative compliance option: 40 ng/joule with a per-unit-pay fee of \$150 until 9/30/25 and 100 on and after 10/1/25 - Zero-NOx emission manufacturer (ZEM) alternative compliance options: - Sales targets: - Phase 1 (2027–2028): 30% zero-NOx units

Rule	Applicability	Control Measure
		70% NOx-emitting furnaces - Phase 2 (2029–2032): 50% zero-NOx units 50% NOx-emitting furnaces - Phase 3 (2033–2035): 75% zero-NOx units 25% NOx-emitting furnaces - Phase 4 (2036 and after): 90% zero-NOx units 10% NOx-emitting furnaces - Mitigation fees: \$100 per furnace sold within the furnace sales target for 2027, adjusted by CPI after 2027 \$100 per furnace sold above the sales target for 2027, adjusted by CPI after 2027
Proposed Amended Rule 1121 – Reduction of NOx Emissions from Residential Type, Natural Gas-Fired Water Heaters (Adoption TBD)	Small natural gas-fired water heaters rated <75,000 Btu/hr; exemptions: - Water heaters subject to Rule 1146.2 - Water heaters used in recreational vehicles - Water heaters in mobile homes (except where specified) - Water heaters to be installed or used in New Buildings with building permits issued prior to date of adoption - Water heaters for installation or in use in Existing Buildings	- Zero emission limits for new installations and existing units upon replacement after the zero emission compliance dates - For New Buildings: - Water Heater & Mobile Home Water Heater: 1/1/27 - For Existing Buildings: - Water Heater: 1/1/29 Prior to zero emission compliance dates: 10 ng NOx/joule or 15 ppm - Gas-fired mobile home water heaters: 40 ng/joule or 55 ppm ZEM alternative compliance options: - Sales targets:

Rule	Applicability	Control Measure
		- Phase 1 (2027–2028): 30% zero-NOx units 70% NOx-emitting water heaters - Phase 2 (2029–2032): 50% zero-NOx units 50% NOx-emitting water heaters - Phase 3 (2033–2035): 75% zero-NOx units 25% NOx-emitting water heaters - Phase 4 (2036 and after): 90% zero-NOx units 10% NOx-emitting water heaters - Mitigation fees: \$50 per water heater sold within the sales target for 2027, adjusted by CPI after 2027 \$250 per water heater sold above the sales target for 2027, adjusted by CPI after 2027
Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters (Amended 6/7/24)	Natural gas-fired water heaters, boilers, and process heaters with a rated heat input >75,000 Btu/hr and ≤2,000,000 Btu/hr	- Zero emission limits for new installations and existing units that reach the end of unit age after the zero emission compliance dates - Phase I compliance dates: Type 1 units (rated heat input capacity less than or equal to 400,000 Btu/hr, excluding Water Heaters subject to the limits of Rule 1121) and Instantaneous Water Heaters ≤ 200,000 Btu/hr New Buildings: 1/1/26

Rule	Applicability	Control Measure
		Existing Buildings: 1/1/29 - Phase II compliance dates: Type 1 pool heaters; Instantaneous Water Heaters > 200,000 Btu/hr; and Type 2 units (greater than 400,000 Btu/hr up to and including 2,000,000 Btu/hr New Buildings: 1/1/28 Existing Buildings: 1/1/31 - Phase III compliance dates: Type 1 High Temperature Units and Type 2 High Temperature Units New Buildings: 1/1/29 Existing Buildings: 1/1/33 - Prior to compliance dates, NOx limits of: 14 ng/joule or 20 ppm, excluding pool heaters 40 ng/joule or 55 ppm for pool heaters

As summarized in Table 4-12, South Coast AQMD's current limits range from 10 ng NOx/joule to 40 ng NOx/joule for space and water heaters, with zero emission limits phasing in at future compliance dates. Staff also examined water and space heater emission limits that have been implemented or recommended for implementation in other air districts in Table 4-13.

TABLE 4-13
OTHER AIR DISTRICTS' CONTROL MEASURES FOR SPACE AND WATER HEATERS

Rule	Applicability	Control Measure
SJVAPCD Rule 4308 – Boilers, Steam Generators, and Process Heaters - 0.075 MMBtu/hr to	Applies to boilers, steam generators, process heaters and water heaters rated from 0.075 to 2 MMBtu/hr; exemptions: - Units installed in manufactured homes - Units installed in recreational vehicles	Pool Heaters using natural gas: ≥0.075 to ≤0.4 MMBtu/hr: 0.068 lb/MMBtu or 55 ppm >0.4 to <2.0 MMBtu/hr: 0.024 lb/MMBtu or 20 ppm

Rule	Applicability	Control Measure
less than 2.0 MMBtu/hr (Amended 11/14/13)	Hot water pressure heaters	All other units using natural gas: 0.024 lb/MMBtu or 20 ppm Units fired on liquid fuel: ≥0.075 to ≤0.4 MMBtu/hr: 0.093 lb/MMBtu or 77 ppm >0.4 MMBtu/hr: 0.036 lb/MMBtu or 30 ppm
SJVAPCD Rule 4905 – Natural Gas-Fired, Fan-Type Central Furnaces (Amended 3/21/24)	Applies to natural gas-fired, fan-type central furnaces <175,000 Btu/hr and combination heating and cooling units <65,000 Btu/hr; Exemptions: Units to be installed with propane conversion kits for propane firing only	Condensing, Non-condensing, Weatherized, and Manufactured Home Units: 14 ng/joule of heat output Emission fee compliance option for manufacturers; fee end date has passed for all unit types except Manufactured Home units with fee end date of 9/30/2025
SJVAPCD Rule 4902 – Residential Water Heaters (Certified Water Heaters) (Amended 3/19/09)	Applies to natural gas-fired residential water heaters ≤ 75,000 Btu/hr; exemptions: - Water heaters >75,000 Btu/hr - Water heaters using fuels other than natural gas - Water heaters used exclusively in recreational vehicles	Natural gas-fired mobile home water heater: 40 ng NOx/joule of heat output Natural gas-fired pool heater: 40 ng NOx/joule Natural gas-fired water heater (excluding mobile home water heaters, instantaneous water heaters, and pool heaters): 10 ng NOx/joule Natural gas-fired instantaneous residential water heaters: 14 ng NOx/joule
SMAQMD Rule 414 – Water Heaters, Boilers and Process Heaters Rated Less Than 1,000,000 Btu per Hour (Amended 10/25/18)	Water Heaters, boilers, or process heaters rated <1 million Btu/hr fired with gaseous or nongaseous fuels; exemptions: - Water heaters in recreational vehicles - Pool/spa heaters <75,000 Btu/hr - Water heaters, boiler, and process heaters fired with liquefied petroleum gas - Hot water pressure washers fired with gaseous or liquid fuels	<75,000 Btu/hr: - Mobile Home: 40 ng NOx/joule or 55 ppm - All others: 10 ng NOx/joule or 15 ppm 75,000 to < 400,000 Btu/hr: - Pool/spa: 40 ng NOx/joule or 55 ppm - All others: 14 ng NOx/joule or 20 ppm 400,000 to < 1 million Btu/hr: - All types – 14 ng NOx/joule or 20 ppm
BAAQMD Rule 9-6 – Nitrogen Oxides Emissions from	Natural Gas-Fired Water Heaters and Boilers; exemptions:	Natural gas-fired storage tank water heaters ≤75,000 Btu/hr:

Rule	Applicability	Control Measure
Natural Gas-Fired Water Heaters (Amended 3/15/23)	- Natural gas-fired water heaters and boilers rated > 2 million Btu/hr - Natural gas water heaters used in recreational vehicles - Water heaters using a fuel other than natural gas Natural gas-fired pool/spa heaters rated <400,000 Btu/hr	10 ng NOx/joule (excludes water heaters used for mobile homes) 0 ng NOx/joule (manufactured after 1/1/27; excludes water heaters used for mobile homes) Natural gas-fired boilers and water heaters >75,000 to 2 million Btu/hr: 14 ng NOx/joule 0 ng NOx/joule (manufactured after 1/1/31) Natural gas-fired boilers and water heaters 400,000 to 2 million Btu/hr: 14 ng NOx/joule Natural gas-fired mobile home water heaters: 40 ng NOx/joule Natural gas-fired pool/spa heaters >400,000 to 2 million Btu/hr: 14 ng NOx/joule
San Diego Air Pollution Control District (SDAPCD) Rule 69.5.1 – Natural Gas-Fired Water Heaters (Adopted 6/24/15)	Natural Gas-Fired Water Heaters ≤ 75,000 Btu/hr; exemptions: - Water heaters rated >75,000 Btu/hr - Water heaters used in recreational vehicles - Water heaters used exclusively to heat swimming pools and hot tubs - Water heaters using fuels other than natural gas - Instantaneous water heaters	Natural gas-fired water heater (excluding mobile home water heaters): 10 ng NOx/joule or 15 ppm Natural gas-fired mobile home water heater: 40 ng NOx/joule or 55 ppm
VCAPCD Rule 74.11 – Natural Gas-Fired Water Heaters (Revised 1/12/10)	Natural Gas-Fired Water Heaters <75,000 Btu/hr; exemptions: - Water heaters rated >75,000 Btu/hr - Natural gas water heaters used in recreational vehicles	Natural gas-fired water heater (excluding mobile home water heaters): 10 ng NOx/joule Natural gas-fired mobile home water heater: 40 ng NOx/joule
VCAPCD Rule 74.11.1 – Large Water Heaters and Small Boilers (Revised 9/11/12)	Large Water Heaters and Small Boilers; exemptions	Units rated 75,000 to 400,000 Btu/hr: 14 ng NOx/joule Units rated 400,000 to 1 million Btu/hr: 20 ppm NOx (after 1/1/13)
VCAPCD Rule 74.22 – Natural Gas-Fired, Fan-Type Central	Natural Gas-Fired, Fan-Type Central Furnaces; exemptions: Units installed in mobile homes	40 ng NOx/joule

Rule	Applicability	Control Measure
Furnaces (Adopted 11/9/93)		
BAAQMD Rule 9-4 – Nitrogen Oxides from Natural Gas-Fired Furnaces (Amended 3/15/23)	Natural gas-fired furnaces rated 175,000 Btu/hr or less	Natural gas-fired fan type central furnace: • 40 ng NO_x/joule (1984+) • 14 ng NO_x/joule (2024+) • 0 ng NO_x/joule (<i>manufactured after 1/1/29; excludes space heaters used for mobile homes</i>)
CARB Zero-Emission Standard for Space and Water Heaters	Space heaters and water heaters, implementation begins in 2030	Zero emission standard
Other Identified Potential Measures	Residential space and water heating	• Develop incentives for early replacement of residential space and water heaters with high-efficiency electric heat pumps or zero-emission heaters • Require that, at replacement, natural gas and propane water or space heaters be replaced with units that run on electricity • Require a zero-NO_x appliance standard in existing buildings. Require new residential buildings to be all-electric as currently implemented in 77 jurisdictions across California states³²

Implementation of CARB’s Zero-Emission Standard for Space and Water Heaters, which is not yet adopted, is scheduled to begin in 2030.³³ BAAQMD’s rules also include zero emission limits for furnaces and water heaters that begin to phase in for new units starting in 2027. South Coast AQMD Rule 1146.2 and Proposed Amended Rules 1111 and 1121 include zero emission limits that phase in from 2027-2033 depending on the type of heater and whether the building is new or existing. Proposed Amended Rules 1111 and 1121 also include an alternative compliance option applicable to manufacturers, establishing zero-NO_x emission space and water heating appliance sales targets that gradually increase over time, along with a mitigation fee for NO_x-emitting appliances sold. In addition, Rule 1146.2 contains unit age requirements for the replacement of NO_x-emitting heaters with zero emission units once they have reached the end of their useful life.

³² J. Gable, Sierra Club, “California’s Cities Lead the Way on Pollution-Free Homes and Buildings,” February 14, 2023. <https://www.sierraclub.org/articles/2021/07/californias-cities-lead-way-pollution-free-homes-and-buildings>

³³ CARB, 2022 State Strategy for the State Implementation Plan, September 22, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf

c. Conclusion

To follow through on commitments included in the 2022 AQMP, South Coast AQMD is amending its rules to promote zero emission technology for newly sold or installed space and water heaters. As of April 2025, a public hearing has been set for June 6, 2025 to consider adoption of Proposed Amended Rules 1111 and 1121. Since the reductions from these rules are relied upon for attainment of the 2015 ozone NAAQS, there are no surplus reductions to be withheld for contingency measures. According to U.S. EPA's guidance and recent case law, a control measure relied upon for attainment purposes cannot serve as a contingency measure.

In addition to enforcing zero emission sale and installation requirements, South Coast AQMD Rule 1146.2 contains in-use requirements for some commercial water heaters to require their replacement with zero emission appliances once they have reached the end of their useful life. The only potential contingency measure that would be surplus to South Coast AQMD's rules would be to require replacement of existing residential heaters before the end of their useful life. Staff does not consider this to be economically feasible for residential units, especially due to the undue burden it would place on disadvantaged communities. However, South Coast AQMD remains committed to providing resources to residents to facilitate the transition to zero emission heaters. For example, South Coast AQMD recently launched the Go Zero pilot incentive program which provides rebates to residents and small businesses that install zero emission heaters.³⁴ Staff has not identified any feasible controls to propose as contingency measures for this source category.

5. Other Fuel Combustion

a. Overview

There are other gaseous and liquid fuel fired combustion equipment that contribute to fuel combustion emissions. These include, but are not limited to, dryers, kilns, afterburners, evaporators, commercial food ovens, fryers, and burn-off furnaces. Three South Coast AQMD rules – Rule 1147, Rule 1147.1, and Rule 1153.1 – regulate NO_x emissions from these combustion units. Rule 1147 – NO_x Reductions from Miscellaneous Sources (Amended May 6, 2022) establishes BARCT NO_x emission limits from miscellaneous combustion equipment and Rule 1147.1 – NO_x Reductions from Aggregate Dryers (Adopted August 6, 2021) establishes NO_x limits representative of BARCT for gaseous fuel fired aggregate dryers.

In addition, South Coast AQMD regulates commercial food ovens under Rule 1153.1 - Emissions of Oxides of Nitrogen from Commercial Food Ovens (Amended August 4, 2023). Prior to the initial adoption of Rule 1153.1 in 2014, commercial food ovens were regulated under Rule 1147. Rule 1153.1 was originally developed to address the unique challenges specific to commercial food ovens, roasters, and smokehouses.

³⁴ South Coast AQMD, Go Zero Pilot Incentive Program for Zero-NO_x Emission Space and Water Heating Appliances, August 2, 2024. <https://www.aqmd.gov/home/rules-compliance/residential-and-commercial-building-appliances/go-zero>

In 2023, Rule 1153.1 was amended to establish NOx limits, including future zero emission limits for certain categories of commercial food ovens, that reflect BARCT.³⁵

Emissions associated with other fuel combustion units are summarized in Table 4-14.

³⁵ South Coast AQMD Final Staff Report Rule 1153.1, August 4, 2023. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-Aug4-022.pdf?sfvrsn=6>

TABLE 4-14
OTHER FUEL COMBUSTION EQUIPMENT EMISSIONS BASED ON 2037 SUMMER PLANNING
INVENTORY

Major Source Category	Process	VOC (tpd)	NOx (tpd)
020 – COGENERATION	995 – OTHER	0.01	0.00
040 – PETROLEUM REFINING (COMBUSTION)	070 – IN-PROCESS FUEL	0.00	0.00
040 – PETROLEUM REFINING (COMBUSTION)	070 – IN-PROCESS FUEL	0.06	0.15
050 – MANUFACTURING AND INDUSTRIAL	012 – OVEN HEATERS (FORCE DRYING SURFACE COATINGS)	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	012 – OVEN HEATERS (FORCE DRYING SURFACE COATINGS)	0.00	0.04
050 – MANUFACTURING AND INDUSTRIAL	070 – IN-PROCESS FUEL	0.03	0.31
050 – MANUFACTURING AND INDUSTRIAL	070 – IN-PROCESS FUEL	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	070 – IN-PROCESS FUEL	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	070 – IN-PROCESS FUEL	0.05	0.00
050 – MANUFACTURING AND INDUSTRIAL	070 – IN-PROCESS FUEL	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	995 – OTHER	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	995 – OTHER	0.19	2.15
050 – MANUFACTURING AND INDUSTRIAL	995 – OTHER	0.02	0.04
050 – MANUFACTURING AND INDUSTRIAL	995 – OTHER	0.00	0.00
050 – MANUFACTURING AND INDUSTRIAL	995 – OTHER	0.00	0.73
052 – FOOD AND AGRICULTURAL PROCESSING	070 – IN-PROCESS FUEL	0.00	0.00
052 – FOOD AND AGRICULTURAL PROCESSING	995 – OTHER	0.00	0.00
060 – SERVICE AND COMMERCIAL	012 – OVEN HEATERS (FORCE DRYING SURFACE COATINGS)	0.00	0.00
060 – SERVICE AND COMMERCIAL	070 – IN-PROCESS FUEL	0.00	0.04
060 – SERVICE AND COMMERCIAL	070 – IN-PROCESS FUEL	0.00	0.01
060 – SERVICE AND COMMERCIAL	070 – IN-PROCESS FUEL	0.00	0.00
060 – SERVICE AND COMMERCIAL	995 – OTHER	0.00	0.00
060 – SERVICE AND COMMERCIAL	995 – OTHER	0.01	0.10
060 – SERVICE AND COMMERCIAL	995 – OTHER	0.24	0.57
060 – SERVICE AND COMMERCIAL	995 – OTHER	0.08	0.98
060 – SERVICE AND COMMERCIAL	995 – OTHER	1.15	3.54
060 – SERVICE AND COMMERCIAL	995 – OTHER	0.00	0.00
099 – OTHER (FUEL COMBUSTION)	080 – RESOURCE RECOVERY	0.00	0.01
099 – OTHER (FUEL COMBUSTION)	995 – OTHER	0.55	0.13
Total		2.41	8.80

b. Evaluation

i. Available Control Technologies

LNB and ULNB are commercially available combustion control technologies and SCR is a post-combustion add-on control technology that is commercially available and commonly employed to control NOx emissions from a wide range of NOx sources. Current NOx limits in Rule 1147 are established between 20 and 60 ppm corrected to 3 percent O2 for most unit categories, although turbines have a NOx limit set at 9 ppm corrected to 15 percent O2. Lower NOx emissions with LNB/ULNB are feasible for burner replacements and new installation. Achieving 20 ppm NOx using LNB/ULNB systems without SCR is feasible in certain applications. Source test data also showed Rule 1147 equipment and burner technology can feasibly achieve between 20 and 30 ppm NOx in existing applications. SCR systems typically require minimum exhaust temperatures of about 500°F, and many applications subject to Rule 1147 would need the installation of additional heat input devices, such as duct burners, to achieve SCR minimum exhaust temperatures. Duct burner installation would lower the system's overall reduction potential and raise NOx emissions at the SCR's inlet. Additionally, according to vendor quotations, adding duct burners would raise the control system's total cost. Current Rule 1147 NOx limits can be feasibly achieved with burner only control technologies.³⁶

The NOx limit for aggregate dryers in Rule 1147.1 is set at 30 ppm. Based on discussions with burner manufacturers, 25 ppm NOx is difficult to achieve in existing facilities due to limited excess air required for low NOx burners, while 30 ppm is achievable for most retrofit applications. Source test data also suggested existing equipment and burner technology can feasibly achieve 30 ppm NOx. Therefore, staff finalized NOx limits at 30 ppm in Rule 1147.1.³⁷ SCR is often infeasible for aggregate dryers due to low exhaust temperatures (refer to details above).

Rule 1153.1 applies to commercial food ovens with a rated heat input capacity equal to or greater than 325,000 Btu/hr which are used to prepare food or products for human consumption. Commercial food ovens include bakery ovens, cooking ovens, dryers, drying ovens, roasters, smokehouses, and tortilla ovens. The most frequently used option to reduce NOx emissions from commercial food ovens is by replacing the burner system with newer LNB technology. In some situations, burners installed within the last 10 years may potentially be tuned and optimized to reduce NOx formation rather than undergoing a complete

³⁶ South Coast AQMD, Final Staff Report for Proposed Amended Rule 1147 – NOx Reductions from Miscellaneous Sources, May 2022. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2022/2022-May6-029.pdf?sfvrsn=6>

³⁷ South Coast AQMD, Final Staff Report for Proposed Rule 1147.1 – NOx Reductions from Aggregate Dryers, August 2021. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-Aug6-028.pdf?sfvrsn=6>

burner replacement, which will result in cost savings for the facilities. Similar to other combustion equipment in this source category, the process temperature of most food ovens is too low for SCR.³⁸

The BARCT assessment performed for Rule 1153.1 identified several categories of commercial food ovens where zero emission technology is commercially available. Commercial bakery ovens were subcategorized based on oven type and unit size and separated into direct-fired and indirect-fired bakery ovens. The direct-fired bakery oven category was further separated based on unit size: greater than 3 MMBtu/hr and less than or equal to 3 MMBtu/hr, with a future zero emission compliance date for units less than 3 MMBtu/hr. The 3 MMBtu/hr threshold is equivalent to approximately 900 kilowatts of electrical power demand, and was set because any commercial bakery oven requiring more than 1 megawatt of power would require further evaluation of the electrical grid capacity for the surrounding area of the facility, and additional time to accommodate necessary upgrades.³⁹ Several manufacturers already offer electric oven options, but they are not widely used at this time. As regulatory agencies and companies who operate large commercial food ovens work to lower emissions, more zero emission commercial oven installations are anticipated.

ii. South Coast AQMD Control Measures

Table 4-15 summarizes NOx emission limits in Rule 1147.

TABLE 4-15
NOX EMISSION LIMITS FOR COMBUSTION EQUIPMENT CATEGORIES IN RULE 1147

Equipment Categories	Process Temperature	Emission Limits (corrected to 3% O ₂ , dry)
Gaseous Fuel Fired Equipment¹		
Afterburner, Degassing Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	20 ppm or 0.024 lb/MMBtu
Remediation Unit	All	60 ppm or 0.073 lb/MMBtu
Burn-off Furnace, Burnout Oven, Incinerator or Crematory with or without Integrated Afterburner	All	30 ppm or 0.036 lb/MMBtu
Evaporator, Fryer, Heated Process Tank, or Parts Washer	All	60 ppm or 0.073 lb/MMBtu

³⁸ South Coast AQMD, Final Staff Report for Proposed Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens, August 4, 2023. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-Aug4-022.pdf?sfvrsn=6>

³⁹ During the rule amendment process for South Coast AQMD Rule 1153.1, Southern California Edison (SCE) advised staff that any commercial bakery oven requiring more than one MW of power would require further evaluation of the electrical grid capacity for the surrounding area of the facility and more than likely require additional time to accommodate necessary upgrades. Final Staff Report for Proposed Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens, August 4, 2023. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-Aug4-022.pdf?sfvrsn=6>

Equipment Categories	Process Temperature	Emission Limits (corrected to 3% O ₂ , dry)
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	<1,200°F	20 ppm or 0.024 lb/MMBtu
	≥1,200°F	30 ppm or 0.036 lb/MMBtu
Make-Up Air Heater or other Air Heater located outside of building with temperature-controlled zone inside building	All	30 ppm or 0.036 lb/MMBtu
Tenter Frame or Fabric or Carpet Dryer	All	20 ppm or 0.024 lb/MMBtu
Autoclave	All	30 ppm or 0.036 lb/MMBtu
Tunnel Kiln or Beehive Kiln	<1,200°F	30 ppm or 0.036 lb/MMBtu
	≥1,200°F	60 ppm or 0.073 lb/MMBtu
Chiller (Absorption or Adsorption)	All	20 ppm or 0.024 lb/MMBtu
Turbine <0.3 MW ²	All	9 ppm or 0.033 lb/MMBtu
Rotary Dryer	All	30 ppm or 0.036 lb/MMBtu
Other Unit or Process Temperature	<1,200°F	30 ppm or 0.036 lb/MMBtu
	≥1,200°F	60 ppm or 0.073 lb/MMBtu
Liquid Fuel Fired Equipment		
All liquid fuel-fired Units ²	<1,200°F	40 ppm or 0.053 lb/MMBtu
	≥1,200°F	60 ppm or 0.073 lb/MMBtu

¹ Emission limit applies to burners in Units fueled by 100% natural gas that are used to incinerate air toxics, VOC, or other vapors; or to heat a Unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOC, or other vapors. The Unit shall be tested or certified to meet the emission limit while fueled with natural gas.

² Emission limits in ppm for Turbines are corrected to 15% O₂, dry basis.

Rule 1147.1 requires that aggregate dryers achieve a NO_x limit of 30 ppm at 3 percent O₂ dry. The compliance schedule depends on the age of the burner and current permit conditions.

Table 4-16 summarizes NO_x emission limits in Rule 1153.1.

TABLE 4-16
NOX EMISSION LIMITS FOR COMBUSTION EQUIPMENT CATEGORIES IN RULE 1153.1

Equipment Categories	Process Temperature	Phase I NOx Emission Limits ¹	Phase II NOx Emission Limits ¹
Direct-Fired Bakery Ovens	≤3 MMBtu/hr	30	0
	>3 MMBtu/hr	30	N/A
Indirect-Fired Bakery Ovens	All	30	0
Griddle Ovens	All	30	N/A
Tortilla Ovens	Heated solely by infrared burners	15	N/A
	All others	30	N/A
Cooking Ovens	≤3 MMBtu/hr	30	0
	>3 MMBtu/hr	30	N/A
Drying Ovens	All	30	N/A
Smokehouses	All	30	0
Dryers	All	30	N/A
Roasters	All	30	N/A

¹Emission limits are in ppm corrected to 3% O₂, dry.

iii. Review of Control Measures in Other Jurisdictions

Other analogous rules adopted by other air districts include SJVAPCD Rules 4309 and 4313, VCAPCD Rule 74.34, and SMAQMD Rule 419. These rules are summarized in Table 4-16 for comparison.

TABLE 4-16
OTHER AIR DISTRICTS' CONTROL MEASURES FOR OTHER FUEL COMBUSTION

Rule	Applicability	Control Measure		
		NOx Limit (ppm, corrected to 19% O ₂)		
SJVAPCD Rule 4309 – Dryers, Dehydrators, and Ovens (Adopted 12/15/05)	Any dryer, dehydrator, or oven that is fired on gaseous fuel, liquid fuel, or is fired on gaseous and liquid fuel sequentially, and the total rated heat input for the unit is ≥5.0 MMBtu/hr. Exempts smokehouses, roasting		Gaseous Fuel Fired	Liquid Fuel Fired
		Asphalt/Concrete Plants	4.3	12.0
		Milk, Cheese, and Dairy Processing <20 MMBtu/hr	3.5	3.5
		Milk, Cheese, and Dairy Processing ≥20 MMBtu/hr	5.3	5.3
		Other processes not described above	4.3	4.3

Rule	Applicability	Control Measure		
	units, and units used to bake or fry food for human consumption			
SJVAPCD Rule 4313 – Lime Kilns (Adopted 3/27/03)	Lime kilns	Gaseous Fuel: 0.10 lb/MMBtu of NOx Distillate Fuel: 0.12 lb/MMBtu of NOx Residual Fuel Oil: 0.20 lb/MMBtu of NOx		
VCAPCD Rule 74.34 – NOx Reductions from Miscellaneous Sources (Adopted 12/13/16)	Dryers, furnaces, heaters, incinerators, kilns, ovens, and duct burners where the total rated heat input for the unit is ≥5.0 MMBtu/hr	NOx Emission Limits (ppm, corrected to 3% O2)		
		Asphalt Manufacturing (Dryers)	40 or 0.048 lb/MMBtu	
		Sand & Gravel Processing (Dryers)	40 or 0.048 lb/MMBtu	
		Paper Products Manufacturing (Hot Air Furnace, Duct Burner, Paper Dryer)	40 or 0.048 lb/MMBtu	
		Metal Heat Treating/ Metal Melting Furnace	60 or 0.072 lb/MMBtu	
		Kiln	80 or 0.096 lb/MMBtu	
			Process Temperature <1,200°F	Process Temperature ≥1,200°F
		Oven, Dryer (besides asphalt, sand or paper dryer), Heater, Incinerator, Other Furnaces, or Other Duct Burner	30 or 0.036 lb/MMBtu	60 or 0.072 lb/MMBtu
SMAQMD Rule 419 – NOx from Miscellaneous Combustion Units (Amended 10/25/18)	Any miscellaneous combustion or cooking unit with a total rated heat input capacity of 2 million Btu/hr or greater located at a major stationary source of NOx, or 5 million Btu/hr or greater not located at a major stationary source of NOx	NOx Emission Limits (ppm, corrected to 3% O2)		
		Gaseous Fuel-Fired Equipment		
			Process Temperature <1,200°F	Process Temperature ≥1,200°F
		Asphalt Manufacturing Operation	40	40
		Incinerator or Crematory	60	60
		Metal Heat Treating or Metal Melting Furnace	30	60
		Other Furnace	30	60
		Oven, Dehydrator, Dryer, Heater, or Kiln	30	60
		Soybean Roaster	45	60
		Other Miscellaneous Combustion units not listed	30	60
		Liquid-Fuel Fired Equipment		

Rule	Applicability	Control Measure		
		All miscellaneous combustion units when liquid fuel-fired	40	60
			Process Temperature <500°F	Process Temperature ≥500°F
		Cooking Unit	40	60

SJVAPCD Rule 4309 contains NO_x limits between 3.5 to 5.3 ppm corrected to 19 percent O₂ which are between 32 and 50 ppm NO_x corrected to 3 percent O₂. Rule 4309 has no separate emission limits based on process temperature, so comparable NO_x emission limits may be more or less stringent compared to existing South Coast AQMD Rule 1147 depending on the process and temperature. SJVAPCD Rule 4313 has an emission limit of 0.10 lb/MMBtu of NO_x from gaseous fuel fired lime kilns which is higher than South Coast AQMD Rule 1147's NO_x limits for kilns that range from 0.024 to 0.036 lb/MMBtu depending on the process temperature.

VCAPCD Rule 74.34 establishes a NO_x emission limit of between 30 to 80 ppm corrected to 3 percent O₂ for any natural gas fired combustion unit where the unit total heat input is greater than or equal to 5 MMBtu/hr. Similar to South Coast AQMD Rule 1147, VCAPCD Rule 74.34 separates emission limits for ovens, dryers, heaters, incinerators, furnaces and duct burners depending on process temperature. Units operating below 1,200°F are limited to 30 ppm NO_x while those operating above or equal to 1,200°F are limited to 60 ppm NO_x. VCAPCD also contains separate limits for kilns of 80 ppm as well as separate limits for paper product manufacturing and aggregate processes limited to 40 ppm NO_x. VCAPCD Rule 74.34 NO_x limits are generally less stringent than existing Rule 1147 requirements and Rule 1147.1 requirement for the aggregate dryer category. For example, the NO_x limit for aggregate dryers is 40 ppm in VCAPCD Rule 74.34 while the limit is 30 ppm in Rule 1147.1. The NO_x limits for ovens, dryers, heaters, and furnaces range from 30 to 60 ppm in VCAPCD Rule 74.34, whereas those limits range from 20 to 30 ppm in Rule 1147.

Rule 1153.1 establishes NO_x emission limits in two phases. Phase I establishes a NO_x limit of 15 ppm for tortilla ovens heated solely by infrared burners and a NO_x limit of 30 ppm for all other commercial food oven categories. Permits for applicable burners were due on July 1, 2024. Phase II establishes zero emission limits for bakery ovens and cooking ovens rated less than or equal to three million Btu per hour, indirect-fired bakery ovens, and smokehouses. For any unit that is 25 years of age or older, and the burner is 10 years of age or older as of January 1, 2027, the operator must decommission the unit by January 1, 2027. For any unit that is less than 25 years of age or the burner is less than 10 years of age as of January 1, 2027, the operator must decommission the unit by January 1 after the end of the calendar year when the unit becomes 25 years of age or older. However, after January 1, 2036, the operator is required to decommission the unit once it reaches 25 years of age, regardless of burner age. An alternative compliance

pathway is available to facilities if the utility company is unable to provide the necessary power to operate the zero emission unit.

Most other air districts either include exemptions or allow higher NO_x limits for commercial food ovens. For example, SJVAPCD Rule 4309 exempts smokehouses, roasting units, and units used to bake or fry food for human consumption from being subject to NO_x limits. Meanwhile, VCAPCD Rule 74.34 establishes a NO_x limit of 30 ppm, but it only applies to ovens with a total rated heat input of 5.0 MMBtu/hr or greater. Although food ovens are subject to SMAQMD Rule 419, the NO_x emission limits are 40 (60) ppm for ovens with process temperatures below (above) 500°F. In comparison, South Coast AQMD Rule 1153.1 phase I establishes a 30 ppm NO_x limit for all cooking equipment categories except tortilla ovens heated by infrared burners, which are subject to an even more stringent NO_x limit of 15 ppm. In addition, phase II of Rule 1153.1 sets a compliance schedule for zero emissions cooking equipment to be implemented based on unit and burner age. Overall, South Coast AQMD enforces the most stringent NO_x limits for commercial food ovens and is the only district to implement future zero emissions limits.

c. Conclusion

A review of control measures for dryers, kilns, afterburners, evaporators, ovens, fryers, burn-off furnaces and other types of fuel combustion equipment found that Rules 1147, 1147.2, and 1153.1 generally contain the most stringent NO_x limits. Nevertheless, staff considered several potential measures such as lowering NO_x limits using ULNB and SCR, but these were not suitable contingency measures considering that it would be technologically infeasible to design, install and operate advanced emission control technology within two years of the triggering event. In addition, SCR is not an appropriate control method for units with low exhaust temperatures. South Coast AQMD's rules as well as regulations in other jurisdictions do not enforce VOC emission limits for this source category. Therefore, staff does not propose any contingency measures for this category of units.

Waste Disposal

a. Overview

Waste Disposal categories in the Basin emissions inventory include 110 – Sewage Treatment, 120 – Landfills, 130 – Incinerators, 140 – Soil Remediation, and 199 – Other (Waste Disposal). Collectively, these source categories account for 18.22 tpd of VOC and 1.68 tpd of NO_x in the 2037 Basin emissions inventory as presented in Table 4-17. These emissions are contributed by landfill flares, composting, and incinerators. Flare emissions under the waste disposal source categories are predominately generated by landfill flares. Smaller quantities of emissions are generated by sewage treatment and incineration flares combusting digester gas, process gas, waste gas, and natural gas. Composting emissions are generated by the decomposition of organic materials. Incinerator emissions are primarily generated by waste disposal activities in the industrial sector and involve combustion of distilled oil, liquified petroleum gas, natural gas, pathological waste and waste gas.

TABLE 4-17
WASTE DISPOSAL EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Industry	VOC (tpd)	NOx (tpd)
110 – Sewage Treatment	0.31	0.00
120 – Landfills	9.72	0.42
130 – Incinerators	0.04	1.25
140 – Soil Remediation	0.00	0.00
199 – Other (Waste Disposal)	8.14	0.01
Total¹	18.22	1.68

¹ Values may not sum due to rounding.

b. Evaluation

1. Landfills

The evaluation of control measures for flares, including landfill flares, is provided in the Petroleum Production and Marketing Section of this document. This evaluation focuses on control measures for landfill equipment other than flares. Landfill emissions are subject to Title 40 Code of Federal Regulations (CFR) Part 60, Subparts Cc and Cf – Emission Guidelines and Compliance Times for MSW Landfills and Subparts WWW and XXX – Standards of Performance for Municipal Solid Waste Landfills.⁴⁰ South Coast AQMD implements these provisions via Rule 1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills that regulates VOC and toxic air contaminant (TAC) emissions, and methane from Municipal Solid Waste (MSW) landfills through the use of active control and collection systems. This rule was last amended in 2011 to adopt CARB statewide requirements for landfills and does not include NOx control measures.⁴¹

Existing regulations for landfill emissions sources in other jurisdictions include BAAQMD Rule 8-34 – Solid Waste Disposal Sites, Mojave Desert Air Quality Management District (MDAQMD) Rule 1126 – Municipal Solid Waste Landfills, and SJVPACD Rule 4642 – Solid Waste Disposal Sites. These rules have requirements for the collection and destruction of landfill gases from solid waste disposal sites and align with federal requirements. Table 4-18 compares South Coast AQMD landfill emissions measures with existing rules. Current limits in the Basin are as stringent as those in place in other jurisdictions.

⁴⁰ Title 40, Code of Federal Regulations Part 60 (40 CFR 60) Subparts Cc, Cf, WWW, and XXX.
<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-60?toc=1>

⁴¹ Title 17, California Code of Regulations, Article 4, and Subarticle 6

TABLE 4-18
COMPARISON OF EXISTING CONTROL MEASURES FOR LANDFILLS

Rule Element	South Coast AQMD Rule 1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills (Amended 4/1/11)	BAAQMD Rule 8-34 – Solid Waste Disposal Sites (Amended 6/15/05)	MDAQMD Rule 1126 – Municipal Solid Waste Landfills (Amended 1/24/22)	SJVAPCD Rule 4642 – Solid Waste Disposal Sites (Amended 4/16/98)
Applicability	All MSW landfills	Solid Waste Disposal Sites	All MSW landfills where the construction, reconstruction, or modification was commenced before May 30, 1999 and has not been modified since or was commenced before July 18, 2014, but on or after May 30, 1991; and the MSW landfill has accepted waste at any time since November 8, 1987 or has additional design capacity available for future waste deposition.	Any solid waste disposal sites which have a gas collection system and/or control device in operation, or are undergoing maintenance or repair

Rule Element	South Coast AQMD Rule 1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills (Amended 4/1/11)	BAAQMD Rule 8-34 – Solid Waste Disposal Sites (Amended 6/15/05)	MDAQMD Rule 1126 – Municipal Solid Waste Landfills (Amended 1/24/22)	SJVAPCD Rule 4642 – Solid Waste Disposal Sites (Amended 4/16/98)
Control Measure	Gas control system that reduces methane by at least 99%, reduces VOC by at least 98%, and prevents emissions from exceeding 500 ppm	- Gas collection system operated so that landfill surface VOC and methane emissions do not exceed 500 ppm - Control device achieves destruction efficiency of at least 98%	- Gas collection system operated so that landfill surface emissions do not exceed 500 ppm - Control system operates to reduce VOC by 98%	- Gas collection system operates so that landfill surface VOC and methane emissions do not exceed 1,000 ppm - Control device achieves a VOC destruction efficiency of at least 98%, or reduces VOC to 20 ppm or less

2. Sewage Treatment

The emissions from this source category are associated with the treatment of liquid waste, regulated under Rule 1179 – Publicly Owned Treatment Works (POTWs). For an evaluation of combustion emissions from boilers, turbines, and engines at POTWs regulated under Rule 1179.1 – Emission Reductions from Combustion Equipment at Publicly Owned Treatment Works (POTWs), refer to the fuel combustion section in this chapter.

South Coast AQMD regulates VOC emissions from sewage treatment through Rule 1179. Rule 1179 does not specify VOC emission limits or require controls, but requires POTWs with a design capacity of at least 10 million gallons per day to submit and implement an Emissions Inventory Plan. The only other regulation identified as comparable to South Coast AQMD Rule 1179 is AVAQMD Rule 1179 which has identical requirements. This indicates that Rule 1179 does not contain an opportunity for further emission reductions to serve as a contingency measure.

3. Composting

Composting is a process in which solid organic waste materials are decomposed in the presence of oxygen under controlled conditions through the action of bacteria and other microorganisms. Composting operations occur at facilities that process greenwaste, biosolids, manure, and/or foodwaste. Greenwaste composting means composting of greenwaste by itself or as a mixture with foodwaste, or with up to 20 percent manure, per pile volume basis. Agricultural composting is conducted in agricultural settings where the feedstock consists of wastes generated on-site by the production and processing of farm or agricultural products. While there are no NO_x emissions associated with composting in the Basin, 8.06 tpd of VOC are emitted and the remainder of this evaluation focuses on those emissions.

South Coast AQMD's Rule 1133 series contains requirements to reduce VOC emissions due to the decomposition of organic materials. In addition, Rule 223 – Emission Reduction Permits for Large Confined Animal Facilities includes composting and VOC control devices as class two mitigation measure options for confined animal operations. Staff evaluated regulations for composting in other jurisdictions. Table 4-19 compares South Coast AQMD composting measures with SJVAPCD Rule 4566 – Organic Material Composting, SJVAPCD Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations, SJVAPCD Rule 4570 – Confined Animal Facilities, Antelope Valley Air Quality Management District (AVAQMD) Rule 1133 – Composting and Related Operations, and Imperial County Air Pollution Control District (ICAPCD) Rule 430 – Composting Operations.

TABLE 4-19
COMPARISON OF CONTROL MEASURES FOR COMPOSTING

Rule	Applicability	Requirements
South Coast AQMD Rule 1133.1 – Chipping and Grinding Activities (Amended 7/8/11)	Chipping and grinding activities to produce materials other than active or finished compost	• Chip or grind and utilize on-site or remove curbside, non-curbside, or mixed greenwaste from the site within 48 hours of receipt • Foodwaste cannot be processed at the facility unless approved by the Local Enforcement Agency
South Coast AQMD Rule 1133.2 – Emission Reductions from Co-Composting Operations (Adopted 1/10/03)	Co-composting operations, defined as those where biosolids and/or manure are mixed with bulking agents to produce compost	• Utilize an enclosure that meets the following requirements: has an inward face velocity of at least 100 ft/min; area of all openings cannot exceed 2% of the enclosure's surface area; and no measurable increase in NH₃ or hydrocarbons above background levels outside the enclosure • Conduct all curing under negative pressure • Exhaust from the enclosure must be vented to an emission control device of at least 80% efficiency for VOC and NH₃ removal • Alternatively, new co-composting operations can submit a compliance plan demonstrating an overall reduction in VOC and NH₃ emissions of at least 80%. The facilities would not have to comply with the above requirements
South Coast AQMD Rule 1133.3 – Emission Reductions from Greenwaste Composting Operations (Adopted 7/8/11)	Greenwaste composting operations that produce active or finished compost from greenwaste by itself or greenwaste in combination with manure or foodwaste	• Use foodwaste for on-site composting within 48 hours of receipt or cover foodwaste with screened or unscreened finished compost For greenwaste composting operations processing greenwaste only or up to 20 percent manure, or up to 5,000 tons per year of foodwaste: • Cover active phase piles with at least 6 inches of finished compost within 24 hours of pile formation • For the first 15 days, apply water such that the top half of the pile is wet at a depth of at least 3 inches For greenwaste composting operations processing greater than 5,000 tons per year of foodwaste:

Rule	Applicability	Requirements
		Active compost containing more than 10% foodwaste must employ an emission control device with at least 80% control efficiency for VOC and NH₃ emissions
South Coast AQMD Rule 223 – Emission Reduction Permits for Large Confined Animal Facilities (Adopted 6/2/06)	Applies to dairies with ≥1,000 cows and poultry farms with ≥650,000 chickens	If composting is selected as a mitigation measure: - Employ an aerated static pile vented to a control device with at least 80% control efficiency - Compost in accordance with the requirements in Rule 1133.2
SJVAPCD Rule 4566 – Organic Material Composting (Adopted 8/18/11)	Composting facilities that compost and/or stockpile organic material	For stockpiles: - Cover the organic material for active compost phase with a waterproof cover that have at least a 6 feet overlap of adjacent sheets and be securely anchored within 10 days if a total throughput of less than 100,000 tons per year, or within three days if throughput is greater than 100,000 tons per year For a composting operation: - With a total throughput of less than 200,000 tons per year of organic material, for windrow composting only implement at least three turns during the active phase and one mitigation measure for the Watering Systems or an approved alternative mitigation measure that demonstrates at least 19% VOC reductions - With throughput of greater than or equal to 200,000 and less than 750,000 tons per year, for windrow composting only implement at least three turns during the active phase, one mitigation measure for the Watering Systems, and the finished compost cover mitigation measure, or an approved alternative mitigation measure that demonstrates at least 60% VOC reductions - With a total throughput of greater than or equal to 750,000 tons per year, implement an approved mitigation measure that demonstrates at least 80% reduction in VOC emissions during the active phase

Rule	Applicability	Requirements
SJVAPCD Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations (Adopted 3/15/07)	Applies to operations that landfill, land apply, compost, or co-compost biosolids, animal manure, or poultry litter	• Within 24 hours of receipt at the facility, landfills with biosolids, animal manure, or poultry litter shall be covered with 6 inches of compost, soil, or a waterproof covering • For throughputs of less than 100,000 tons per year, implement class one mitigation measures for co-composting operations • For throughputs of greater than 100,000 tons per year, implement class one mitigation measures and one class two measure for co-composting operations with at least 80% control efficiency
SJVAPCD Rule 4570 – Confined Animal Facilities (Amended 10/21/10)	Applies to dairies with ≥500 cows and poultry farms with ≥400,000 chickens	If composting is selected as a mitigation measure: • Employ an aerated static pile vented to a control device with at least 80% control efficiency
Antelope Valley Air Quality Management District (AVAQMD) Rule 1133 – Composting and Related Operations (Adopted 3/17/09)	Applies to new and existing chipping and grinding activities, and new and existing composting and related operations	• Remove foodwaste from the site or use foodwaste for on-site composting within two days of receipt • Chip or grind, or use on-site, or remove: ○ Curbside greenwaste from the site within three days of receipt ○ Non-curbside greenwaste from the site within 14 days of receipt ○ Mixed greenwaste from the site within seven days of receipt • Remove chipped or ground curbside greenwaste from the site or use on-site within three days of being chipped and ground
Imperial County Air Pollution Control District (ICAPCD) Rule 430 – Composting Operations (Adopted 12/22/20)	New and existing Composting and Co-Composting operations	• Facilities engaged in composting/co-composting operations required to select from a menu of mitigation options involving treatment of compost piles and manure management. • Facilities with throughput of at least 100,000 tons per year required to implement additional measure for either active or curing composting ○ Conduct all active or all curing composting in aerated static pile or in-vessel composting system vented to a VOC emission control device with a VOC control efficiency of at least 80%, or implement alternate mitigation measure that demonstrates at least an 80% VOC reduction

South Coast AQMD Rule 1133.3 requires food waste to be composted or covered within two days, whereas SJVAPCD Rule 4566 allows three or 10 days, depending on throughput. Under Rule 1133.3, facilities that process more than 5,000 tons of food waste per year, where the active compost contains more than 10 percent food waste, must employ an emission control device with at least 80 percent control efficiency for VOC emissions. In comparison, SJVAPCD Rule 4566 only requires facilities that process over 750,000 tons per year to demonstrate VOC reductions of at least 80 percent during the active phase. SJVAPCD Rule 4565 requires implementation of a class two mitigation measure that demonstrates a VOC control efficiency of 80 percent during the active phase of composting for facilities that process biosolids, animal manure, or poultry litter with throughputs of at least 100,000 tons per year. South Coast AQMD Rules 1133.2 and 223 also require 80 percent control efficiency. Overall, South Coast AQMD requirements for composting are as stringent or more stringent than those in SJVAPCD Rules 4565 and 4566.

SJVAPCD Rule 4570 and South Coast AQMD Rule 223 both provide a list of mitigation measures for operators of confined animal facilities to choose from and include composting as an option. SJVAPCD Rule 4570 has more stringent applicability thresholds than South Coast AQMD Rule 223 (1,000 dairy cows vs. 500 dairy cows and 650,000 birds vs. 400,000 birds). Rule 223 is currently undergoing an amendment process to align with the more stringent thresholds in SJVAPCD Rule 4570. This will be discussed in more detail under the Miscellaneous Processes – Farming Operations section.

AVAQMD Rule 1133 regulates emissions of VOC and NH₃ from composting and related operations and prevents inadvertent decomposition from occurring during chipping and grinding operations. AVAQMD Rule 1133 requirements include chipping, grinding, or removal of curbside greenwaste from the site within three days, non-curbside greenwaste within 14 days, and mixed greenwaste from the site within seven days of receipt. South Coast AQMD Rule 1133.1 has more stringent requirements than AVAQMD for chipping and grinding, where operators must chip or grind and utilize on-site or remove curbside, non-curbside, or mixed greenwaste from the site within two days of receipt.

ICAPCD Rule 430 regulates VOC and NH₃ emissions from composting, co-composting and related operations involving animal manure and poultry litter. ICAPCD Rule 430 requires operators to select from a menu of mitigation options involving treatment of compost piles and manure management. South Coast AQMD Rule 1133.2 establishes performance standards for operations to achieve at least 70 percent and 80 percent control efficiency for VOC and NH₃ emissions for existing and new operations, respectively. South Coast AQMD Rule 1133.3 requires emission control devices and establishes Best Management Practices (BMPs) for greenwaste composting operations based on the amount of foodwaste a facility processes. Therefore, staff concludes that South Coast AQMD's rules for composting are more stringent than the composting measures in ICAPCD Rule 430.

South Coast AQMD's rules are as stringent as, if not more stringent than, other districts' rules and no contingency measure opportunities were identified.

4. Incinerators

Incinerators are used to burn waste material at high temperatures until reduced to ash. There are three MSW incinerators in the Basin, all located at the City of Long Beach's Southeast Resource Recovery Facility (SERRF). The 2022 AQMP included control measure L-CMB-09: NO_x Reductions from Incinerators to reduce NO_x emissions by replacing or retrofitting incinerators and other combustion equipment associated with incinerators with zero and low NO_x emission technologies. The South Coast Air Basin Attainment Plan for the 2012 Annual PM_{2.5} Standard (PM_{2.5} Plan) included an analogous control measure (BCM-07: Emission Reductions from Incinerators). In addition, U.S. EPA released the Federal "Good Neighbor Plan" for the 2015 Ozone NAAQS in March 2023, which specifies NO_x limits for MSW incinerators to be achieved by 2026.⁴²

As part of implementation of L-CMB-09, BCM-07, and U.S. EPA's Good Neighbor Plan, staff conducted a BARCT analysis for the MSW incineration equipment category. South Coast AQMD Rule 1165 – Control of Emissions from Municipal Solid Waste Incinerators was developed to satisfy South Coast AQMD's commitments for incinerators under these plans.⁴³ Rule 1165 reduces NO_x emissions through the installation of SCR technology and requires continuous emission monitoring, periodic source testing to ensure compliance, and establishes requirements for recordkeeping.

Table 4-20 compares South Coast AQMD Rule 1165 with control measures for incinerators in other jurisdictions. The only other municipal solid waste facility in California is in Stanislaus County in the San Joaquin Valley.⁴⁴ MSW combustors are required to comply with NO_x emission limits under SJVAPCD Rule 4352 – Solid Fuel Fired Boilers, Steam Generators and Process Heaters; however, there are no applicable VOC emission limits. Additionally, Placer County APCD's Rule 206 – Incineration Burning enforces a one-hour average NO_x limit of 50 ppm at 12 percent CO₂. Based on operating data for CO₂ measurements of the three units at SERRF, this is approximately equivalent to the current permitted operating limit of the three units. Upon full implementation, Rule 1165 will further reduce NO_x emissions beyond the level required by other districts' rules.

⁴² U.S. EPA. Federal "Good Neighbor Plan" for the 2015 Ozone National Ambient Air Quality Standards implements "good neighbor" provision of Clean Air Act Section 1102 (a)(2)(D)(i)(I). <https://www.govinfo.gov/content/pkg/FR-2023-06-05/pdf/2023-05744.pdf>

⁴³ South Coast AQMD, Final Staff Report for Proposed Rule 1165 - Control of Emissions from Municipal Solid Waste Incinerators, September 2024. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-Sep6-028.pdf?sfvrsn=8>

⁴⁴ South Coast AQMD, Proposed Rule 1165 - Control of Emissions from Municipal Solid Waste Incinerators Public Workshop, July 11, 2024. https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/pr-1165/pr-1165_public-workshop-final.pdf?sfvrsn=8

TABLE 4-20
COMPARISON OF CONTROL MEASURES FOR INCINERATORS

Rule Element	South Coast AQMD Rule 1165 – Control of Emissions from Municipal Solid Waste Incinerators (Adopted 9/6/24)	SJVAPCD Rule 4352 – Solid Fuel Fired Boilers, Steam Generators and Process Heaters (Amended 12/16/21)	Placer County APCD Rule 206 – Incineration Burning (Amended 10/13/16)	U.S. EPA Federal “Good Neighbor Plan” for the 2015 Ozone NAAQS (Issued 3/15/23)
Applicability	Municipal Solid Waste Incinerator that combusts more than 35 tons or more per day	Municipal Solid Waste Incinerators	Any incinerator which burns combustible or flammable waste or refuse-derived fuel, including pathological waste	Solid Waste Combustors or Incinerators
Control Measure	• NOx emission limit of 110 ppm at 7% O2 on a 24-hour block average by 5/1/26 • NOx emission limit of 105 ppm at 7% O2 on a 30-day rolling average by 5/1/26 • NOx emission limit of 75 ppm at 7% O2 on a 30-day rolling average by 5/1/29	After 1/1/24: • NOx emission limit of 110 ppm at 12% CO2 on a 24-hour block average • NOx emission limit of 90 ppm at 12% CO2 on a 12-month rolling average	• NOx emission limit of 50 ppm at 12% CO2 on a one-hour average	• NOx emission limit of 110 ppm at 7% O2 on a 24-hour block average by 5/1/26 • NOx emission limit of 105 ppm at 7% O2 on a 30-day rolling average by 5/1/26
Exemptions	• Medical/infectious waste • whole or chipped tree stumps • whole or chipped tree limbs • sewage sludge	• Medical Waste incinerators • Limits shall not apply during start-up or shutdown	• Biomass boilers • Crematory incinerators • Medical Waste incinerators • Air curtain incinerators	

Rule Element	South Coast AQMD Rule 1165 – Control of Emissions from Municipal Solid Waste Incinerators (Adopted 9/6/24)	SJVAPCD Rule 4352 – Solid Fuel Fired Boilers, Steam Generators and Process Heaters (Amended 12/16/21)	Placer County APCD Rule 206 – Incineration Burning (Amended 10/13/16)	U.S. EPA Federal “Good Neighbor Plan” for the 2015 Ozone NAAQS (Issued 3/15/23)
	• wood pallets • construction, renovation, or demolition wastes • railroad ties • telephone poles • industrial process or manufacturing process wastes • Motor vehicles • Pyrolysis equipment • Gasification equipment • equipment used for moisture removal and/or biological degradation processes		• Treatment units associated with aeration of contaminated soil, air stripping, and vapor extraction operations	

c. Conclusion

As detailed above, South Coast AQMD Rule 1165 is at least as stringent as other districts' rules and staff found no opportunity to accommodate contingency measures for the waste disposal categories in the Basin that are surplus to the attainment strategy and would achieve quantifiable reductions within two years of a triggering event.

Cleaning and Surface Coatings

Cleaning and Surface Coating source categories include 210 – Laundering, 220 – Degreasing, 230 – Coatings and Related Process Solvents, 240 – Printing, 250 – Adhesives and Sealants, and 299 – Other (Cleaning and Surface Coating). These source categories contribute 0.04 tpd NO_x and 40.63 tpd of VOC to the 2037 Basin summer planning emissions inventory.

Emissions from these source categories are primarily VOC from the application and use of solvents, coatings, inks, adhesives, and sealants. More than half of VOC emissions are from the Coatings and Related Processes category and key contributing emission sources consist of auto refinishing, metal parts and products coatings, wood furniture and fabricated products coatings, aircraft and aerospace coatings, and thinning and cleanup solvent uses. Table 4-21 includes the list of source categories, VOC emissions, and applicable South Coast AQMD VOC rules. Key requirements and VOC limits for these VOC rules are summarized in Table 4-22.

TABLE 4-21
LIST OF SOURCE CATEGORIES AND APPLICABLE VOC RULES IN SOUTH COAST AQMD

Cleaning and Surface Coating Category	VOC Emissions (tpd)	NO _x Emissions (tpd)	Applicable South Coast AQMD Rules
210 – Laundering	0.19	0.00	1102
220 – Degreasing	13.54	0.00	442, 1122, 1171
230 – Coatings and Related Process Solvents	21.01	0.00	442, 1104, 1106, 1107, 1115, 1124, 1125, 1126, 1132, 1136, 1145, 1151, 1162
240 – Printing	0.89	0.00	442, 1128, 1130, 1130.1
250 – Adhesives and Sealants	4.62	0.00	442, 1168
299 – Other (Cleaning and Surface Coatings)	0.65	0.04	442, 1144
Total	40.63	0.04	

TABLE 4-22
SOUTH COAST AQMD RULES FOR CLEANING AND SURFACE COATING CATEGORIES

Rule	Applicability	Control Measure
Rule 442 – Usage of Solvents (Amended 12/15/00)	Applies to any person using VOC-containing materials or equipment that emit VOC and are not subject to Regulation XI rule. VOC-containing materials include coatings, resins, adhesives, inks, solvents, thinners, diluents, mold seal and release compounds, lubricants, cutting oils and quenching oils. Equipment and materials include, but are not limited to, coating, adhesive, and ink application equipment, metal forming, casting, or forging operations	Shall not discharge organic materials into the atmosphere from equipment in which organic solvents or materials containing organic solvents are used, unless such emissions have been reduced by 85%
Rule 1102 – Dry Cleaners Using Solvent Other Than Perchloroethylene (Amended 11/17/00)	Applies to all persons owning or operating a dry cleaning facility using solvent other than perchloroethylene (PERC)	- Install and operate a solvent recovery dryer or an equivalent control device that reduces VOC emissions from drying tumblers by at least 90% by weight - Usage of overall solvent shall be less than 4.5 lb/100 lb of materials dry cleaned
Rule 1104 – Wood Flat Stock Coating Operations (Amended 8/13/99)	Applies to all persons applying coating, inks, and adhesives to wood flat stock for the purpose of manufacturing a finished wood panel intended for attachment to the inside walls of buildings, including, but not limited to, homes and office buildings, mobile homes, trailers, prefabricated buildings and similar structures, boats, and ships; or a finished exterior wood siding intended for use in construction	VOC requirements: 250 grams/Liter (g/L) of coating, ink, or adhesive (2.1 lb/gal) for interior wood panels and exterior wood siding Application methods: - Flow coater, roll coater, or dip coater; - Hand application method; or - High-volume, low-pressure (HVLP) or electrostatic applications Control equipment requirements: - Reduce emissions from an emission collection system by at least 95% by weight, or the output of the air pollution control device less than 50 ppm as carbon (ppmC)

Rule	Applicability	Control Measure
		Emission collection system collection efficiency at least 90% by weight of the emissions generated by the sources
Rule 1106 – Marine and Pleasure Craft Coatings (Amended 1/6/23)	Applies to any person who supplies, sells, offers for sale, markets, manufactures, blends, packages, repackages, possesses or distributes any Marine or Pleasure Craft Coating and any associated solvent used with a Marine or Pleasure Craft Coating for use, as well as any person who applies, stores at a worksite, or solicits the application of any Marine or Pleasure Craft Coating and any associated solvent used with a Marine or Pleasure Craft Coating, within the South Coast AQMD Jurisdiction	VOC contents of marine coatings: 275 to 420 g/L of baked coating 340 to 610 g/L of air dried coating VOC content of pleasure craft coatings: 330 to 780 g/L VOC content of low-solids coatings: 120 g/L for marine and pleasure craft coatings
Rule 1107 – Coating of Metal Parts and Products (Amended 1/6/23)	Applies to all metal coatings operations except those performed on aerospace assembly, magnet wire, marine craft, motor vehicle, metal container, and coil coating operations	VOC content of coatings: 275 to 420 g/L (2.3 to 3.5 lb/gal) of air dried or baked coating
Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)	Applies to an owner or operator engaged in assembly line coating operations conducted during the manufacturing of new motor vehicles and other automotive parts that are coated during the vehicle assembly process as well as during associated solvent cleaning operations	VOC emission limits for motor vehicle assembly coating operations: - Electrodeposition primer operations: - Solids turnover ratio (RT) ≥ 0.16 0.084 kg/L of solid deposited $0.04 \leq RT < 0.16$ $0.084 \times 350^{0.160-RT}$ kg/L $RT < 0.04$ - No VOC emission limit - Primer-surfacer, topcoat, combined primer-surfacer and topcoat operations: 1.44 kg/L (12 lb/gal) of solids - Final repair operations: 0.58 kg/L (4.8 lb/gal) of coating

Rule	Applicability	Control Measure
		VOC content limits for miscellaneous materials used in motor vehicle assembly coating operations: • Vary depending on materials used ranging from 200 to 900 lb/gal (1.7 to 7.5 lb/gal)
Rule 1122 – Solvent Degreasers (Amended 5/1/09)	Applies to all persons who own or operate batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing VOC or with a National Emission Standards for Hazardous Air Pollutant (NESHAP) halogenated solvent	Cleaning solvent VOC content limits: • Batch-loaded cold cleaners: 25 g/L • Conveyorized (in-line) cold cleaners: 25 g/L • Vapor degreasers: 25 g/L Includes other applicable requirements
Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	Applies to all coating operations in the manufacturing and/or reconditioning of metal cans, containers, drums, pails, lids, closures, flat metal sheets, strips, rolls, and coils	VOC limits vary depending on coating categories: • Can coatings: 225 to 660 g/L • Drums, pails, and lids coatings: 340 to 510 g/L • Coil coatings: 200 g/L • All other operations: 0 to 800 g/L Emission control system with ≥90% collection efficiency and destruction efficiency ≥95% by weight
Rule 1126 – Magnet Wire Coating Operations (Amended 1/13/95)	Applies to all coating operations on magnet wire, where the wire is continuously drawn through a coating applicator	Rule applicability threshold: Operations emit 1 kg (2.2 lb)/hour or more but not to exceed 5 kg (11 lb)/day of VOC VOC limit: 200 g/L (1.67 lb/gal) of coating Emission control system shall achieve ≥90% overall efficiency by direct incineration at ≥1,499 °F
Rule 1130 – Graphic Arts (Amended 5/2/14)	Applies to any person performing graphic arts operations or who supplies, sells, offers for sale, markets, manufactures, blends, repackages, stores at a worksite, distributes, applies or solicits the	VOC content of graphic arts materials limits varies by material type, ranging from 150 to 300 g/L VOC content of fountain solution varies ranging from 16 to 85 g/L

Rule	Applicability	Control Measure
	application of graphic arts materials for use	Approved emission control system requires reduction of VOC emissions by at least 95% or no more than 50 ppm at the output of the control device
Rule 1130.1 – Screen Printing Operations (Amended 12/13/96)	Applies to persons performing screen printing operations or who sell, distribute, or require the use of screen printing materials	For screen printing coatings and inks products: 500 to 800 g VOC/L For screen printing coatings and inks substrate: 600 to 800 g VOC/L For screen printing materials: 400 to 800 g VOC/L For extreme performance screen printing materials: 400 g VOC/L
Rule 1132 – Further Control of VOC Emissions from High-Emitting Spray Booth Facilities (Amended 5/5/06)	Applies to any spray booth facility, except petroleum industry facilities, that uses VOC-containing materials that amount to more than 40,000 lb (20 tons) per year of VOC emissions in any emission inventory year beginning in 1999	Requirements for each spray booth: • VOC-containing materials that have a VOC content 65% or lower than any applicable rule limit; • Emission control system that has an overall efficiency of 65% or more; or • A combination thereof Alternative compliance plan, in lieu of the above requirements: • Use of VOC-containing materials that have a VOC content at least 85% lower than any applicable rule limit, emission control systems that have an overall efficiency at least 85% by weight, or a combination thereof • Any combination of measures to reduce VOC emissions by at least 65 percent
Rule 1136 – Wood Products Coatings (Amended 6/14/96)	Applies to coatings or strippers to, and surface preparation of, any wood products, including furniture, cabinets, shutters, frames and toys. This rule shall not apply to residential noncommercial operations	VOC content limits of coatings and strippers: • High-solid stains: 350 g/L • Inks: 500 g/L • Mold-seal coatings: 750 g/L • Multi-colored coatings: 275 g/L • Low-solids coatings: 120 g/L • All other coatings: 275 g/L

Rule	Applicability	Control Measure
		VOC limits in wood products strippers: • Contain less than 350 g VOC/L • VOC composite vapor pressure ≤ 2 mm Hg (0.04 psia) at 20°C
Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents (Amended 12/3/10)	Applies to any person who supplies, sells, offers for sale, or manufactures consumer paint thinners and multi-purpose solvents for sale, as well as any person who uses or solicits the use of any consumer paint thinner and multi-purpose solvent within the South Coast AQMD jurisdiction	VOC content limits: • Consumer paint thinner: 25 g/L • Consumer multi-purpose solvent: 25 g/L
Rule 1145 – Plastic, Rubber, Leather, and Glass Coatings (Amended 12/4/09)	Reduces VOC emissions from the application of coatings to any plastic, rubber, leather, or glass products	VOC limits vary by coating category ranging from 60 to 800 g/L Air pollution control equipment shall reduce VOC emissions from an emission collection system by $\geq 95\%$, or the device output VOC concentration shall be less than 50 ppm calculated as carbon
Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing (Amended 5/2/08)	Applies to the cleaning and degassing of a pipeline opened to atmosphere outside the boundaries of a facility, stationary tank, reservoir, or other container, storing or last used to store VOC	Vapor pressures of VOC within the tank, reservoir or other container to be less than: • 500 gal (1,893 L): 3.9 psia • 26,420 gal (100,000 L): 2.6 psia • 100,000 gal (378,500 L): 0.5 psia
Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (Amended 11/1/24)	Applies to VOC emissions from automotive coating applications performed on motor vehicles, mobile equipment, and associated parts and components	VOC content limits vary by automotive coating category ranging from 60 to 840 g/L (0.5 to 7.0 lb/gal)
Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	Applies to any person who uses, stores, sells, supplies, distributes, offers for sale, or manufactures any adhesives, adhesive primers, sealants, or sealant primers for use, or the owner or operator of a facility conducting such operations	VOC content limits: For adhesives • 20 to 850 g/L • Higher viscosity CPVC: 490 g/L (400 g/L, effective 7/1/24) • Rubber vulcanization adhesive 850 g/L (250 g/L, effective 1/1/28) • Top and trim adhesive: 540 g/L (250 g/L, effective 1/1/28)

Rule	Applicability	Control Measure
		For substrate specific adhesives: • 30 to 200 g/L For sealants: • 50 to 760 g/L • Clear, paintable, and immediately water-resistant sealant: 380 g/L (250 g/L, effective 1/1/26) • On-component foam sealant: 18% (~180 g/L, effective 7/1/23) For adhesive primers: 150 to 785 g/L For sealant primers: 250 to 775 g/L
Rule 1171 – Solvent Cleaning Operations (Amended 5/1/09)	Applies to all persons who use these solvent materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas; all persons who store and dispose of these materials used in solvent cleaning operations; and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations	VOC content limits for product cleaning during manufacturing process or surface preparation for coating, adhesive, or ink application: • 25 to 800 g/L (0.21 to 6.7 lb/gal) For repair and maintenance cleaning: • 25 to 800 g/L (0.21 to 6.7 lb/gal) For cleaning of coatings or adhesive application equipment: • 25 g/L (0.21 lb/gal) For cleaning of ink application equipment: • 25 to 100 g/L (0.21 to 0.83 lb/gal) For cleaning of polyester resin application equipment: • 25 g/L (0.21 lb/gal)

To find potentially feasible contingency measures, staff reviewed other air districts' VOC rules for the cleaning and surface coating category that are comparable to South Coast AQMD rules. The small quantity of NO_x emissions is associated with major source category 299 – Other Cleaning and Surface Coatings. These emissions will be discussed in more detail as part of the analysis for that category.

In the following sections, South Coast AQMD staff compared emission limits, optional control requirements, and work practice standards in South Coast AQMD rules to comparable requirements in rules from other air districts.

1. Laundering

a. Overview

This source category accounts for 0.19 tpd of VOC and zero NO_x in the Basin's 2037 summer planning emissions inventory.

b. Evaluation

South Coast AQMD Rule 1102 establishes dry cleaning operation and equipment requirements for dry cleaners using non-perchloroethylene as the cleaning solvent. Rule 1102 does not have a small operation exemption for dry cleaning solvent usage, while other air districts such as SMAQMD and BAAQMD exempt dry cleaning facilities that use less than 10,000 liters (L) of solvent per year. All air districts including South Coast AQMD have similar equipment and operation requirements, including no liquid leaks or visible emissions from dry cleaning equipment, storage of solvent in sealed containers, a full drainage of cartridge filters before removal, etc. Rule 1102 requires draining cartridge filters a minimum of 24 hours before being discarded, whereas other districts require eight to 24 hours lead time to drain filters before being discarded. It also requires emission control equipment that reduces VOC emissions with a control efficiency of 90 percent or more.

c. Conclusion

As demonstrated below in Table 4-23, South Coast AQMD Rule 1102 currently has in place the most stringent measures feasible, and the rule requirements are at least as stringent as applicable rules in other air districts. Therefore, staff concludes that no additional emission reduction opportunities exist and that no measure is feasible as a contingency measure.

TABLE 4-23
COMPARISON OF APPLICABLE RULES FOR MAJOR SOURCE CATEGORY OF LAUNDERING

Rule Element	South Coast AQMD Rule 1102 – Dry Cleaners Using Solvent Other Than Perchloroethylene (Amended 11/17/00)	SJVAPCD Rule 4672 – Petroleum Solvent Dry Cleaning Operations (Amended 12/17/92)	SMAQMD Rule 444 – Petroleum Solvent Dry Cleaning (Adopted 8/13/81)	BAAQMD Rule 8-17 – Non-Halogenated Solvent Dry Cleaning Operations (Amended 3/4/09)	VCAPCD Rule 74.5.1 – Petroleum Solvent Dry Cleaning (Adopted 12/4/90)
Applicability	Dry cleaning facility using solvent other than perchloroethylene (PERC)	Petroleum solvent washers, dryers, solvent filters, settling tanks, vacuum stills, and other containers and conveyors of petroleum solvents that are used in petroleum solvent dry cleaning facilities	Emissions of petroleum solvents used in dry cleaning	Dry cleaning or related operations using non-halogenated solvent(s) or solvent(s) containing less than 5% by weight of total halogens	Any petroleum solvent dry cleaning operation
Exemptions	- Dry cleaning equipment exclusively using PERC as cleaning solvent - Dry cleaning equipment exclusively using a Group II exempt compound as cleaning solvent, professional laundering equipment using liquid CO₂ as cleaning solvent, and professional wet cleaning equipment using water as cleaning solvent, provided the detergents and additives contain <50 g VOC/L	Dry cleaning facilities exclusively using PERC as cleaning solvent	- Dry cleaning using other than a petroleum solvent (e.g., Stoddard) - Dry cleaners consuming <10,000 L (2,642 gal) of petroleum solvent per year	- Dry cleaning operations that use CO₂, aqueous solvents, or synthetic solvents containing ≥5% by weight of total halogens (which are subject to Rule 11-16) - Dry cleaners consuming <10,000 L (2,642 gal) of petroleum solvent per year	
Equipment and Operating Requirements	- No liquid leaking from equipment - Keep all washer lint traps, button traps, access doors, and other parts closed at all times	- No liquid leaking from equipment - Keep all washer lint traps, button traps, access doors, and other parts closed at all times	- No liquid leaking from equipment - Keep all solvents in closed containers - Keep all washer lint traps, button traps,	- Keep all parts of dry cleaning system closed - Cartridge filters shall be drained in the filter housing for at least eight hours or placed in an enclosed device	A filter system that reduces petroleum solvent content in all filtration wastes to no greater than 1.0 lb/100 lb of articles cleaned

Rule Element	South Coast AQMD Rule 1102 – Dry Cleaners Using Solvent Other Than Perchloroethylene (Amended 11/17/00)	SJVAPCD Rule 4672 – Petroleum Solvent Dry Cleaning Operations (Amended 12/17/92)	SMAQMD Rule 444 – Petroleum Solvent Dry Cleaning (Adopted 8/13/81)	BAAQMD Rule 8-17 – Non-Halogenated Solvent Dry Cleaning Operations (Amended 3/4/09)	VCAPCD Rule 74.5.1 – Petroleum Solvent Dry Cleaning (Adopted 12/4/90)
	- Clean button and lint traps each working day - Store still residue, used filtering material, lint, used solvent and all other wastes containing solvent in sealed containers - Cartridge filters shall be fully drained in a sealed filter housing for at least 24 hrs before removed - Store all solvents in closed containers - No liquid solvent or visible emission is allowed to vaporize from wastewater evaporators - Overall gallons of solvent used shall be <4.5 lb/100 lb of materials dry cleaned	- Store solvents in closed container - Store used filtering material into a sealed container immediately after removal from the filter - Cartridge filters shall be fully drained in a sealed filter housing for at least 24 hrs before being discarded, or 12 hrs if the filter is dried in a dryer vented to an emission control device - Reduce petroleum solvent content in all filtration wastes to ≤ 1 kg/100 kg of materials dry cleaned	access doors, and other parts closed at all times - Store still residue in sealed containers - Cartridge filters shall be fully drained in a sealed filter housing for at least 12 hours before removal - Reduce solvent content in filtering system <1 kg/100 kg of articles dry cleaned	including a solvent recovery dryer until dry before being discarded	Cartridge filters shall be fully drained in a sealed filter housing for at least 24 hrs before being discarded, or 12 hrs if the filter is dried in a dryer vented to an emission control device
Emission control requirements	Requires a solvent recovery dryer that reduces VOC emissions by at least 90%	Requires a solvent recovery dryer that reduces VOC emissions by at least 90%	Limit solvent emissions to an average of 3.5 kg/100 kg of articles dry cleaned	A solvent recovery dryer shall recover at least 85% by weight of solvent	A solvent recovery dryer shall reduce VOC emissions by at least 90%

2. Degreasing

a. Overview

There are three South Coast AQMD rules that regulate VOC emissions from degreasing – Rules 442, 1122, and 1171. This source category accounts for 13.54 tpd of VOC and zero NO_x emissions in the Basin's 2037 summer planning inventory. A breakdown of these emissions is provided in Table 4-24. Table 4-25 summarizes applicable rule requirements in South Coast AQMD and other air districts for this major source category.

**TABLE 4-24
DEGREASING EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Source Category	VOC (tpd)
204 – Cold Cleaning (Batch - Conveyor - Spray Gun)	7.89
206 – Vapor Degreasing (Batch - Conveyor)	0.12
208 – Handwiping	3.00
995 – Other	2.52
Total	13.54

b. Evaluation

South Coast AQMD Rule 442 establishes general VOC emission limits and emission control requirements for VOC-containing materials or equipment that are not subject to source-specific VOC rules. Rule 442 generally requires an overall VOC emission reduction of 85 percent. While other air districts have similar requirements, South Coast AQMD has a facility-wide VOC emission limit of 833 pounds per month per facility. This limit is more stringent than most other districts' rules except for Eastern Kern APCD (EKAPCD) Rule 410, which contains a facility-wide VOC emission limit of 450 pounds per month. However, nearly all facilities in South Coast AQMD are subject to source-specific VOC rules which makes Rule 442 not applicable. In the rare instances where Rule 442 is applicable, a control device is the primary route of compliance.

South Coast AQMD Rule 1122 establishes a VOC content limit for cleaning solvents of 25 grams per liter (g/L) of solvent or less. This VOC content limit is as stringent as other air districts' applicable rules.

South Coast AQMD Rule 1171 establishes VOC emissions control and other applicable operational requirements in solvent cleaning operations. Comparing the VOC content limits in cleaning solvents with other air districts in California is not straightforward because other air district rules have different scope of applicability and exemptions compared to South Coast AQMD's rule, and include VOC limits that apply not only to solvent cleaning operations, but also to coating operations. For example, BAAQMD Rule 8-16 has VOC content limits on architectural coating operations, which are regulated by South Coast AQMD Rule 1113. Table 4-25.3 summarizes the comparison of Rule 1171 with similar rules from other air districts. Overall, Rule 1171 and other applicable South Coast AQMD rules have VOC limits and emission control requirements comparable to other air districts for the degreasing source category.

c. Conclusion

Based on the evaluation that South Coast AQMD has rules applicable to this source category as stringent as or more stringent than other districts' rules, staff did not find any potential contingency measure in the degreasing category.

TABLE 4-25
COMPARISON OF APPLICABLE RULES FOR THE MAJOR SOURCE CATEGORY OF DEGREASING

TABLE 4-25.1 – General Usage of Solvents					
Rule Element	South Coast AQMD Rule 442 – Usage of Solvents (Amended 12/15/00)	SJVAPCD Rule 4661 – Organic Solvents (Amended 9/20/07)	EKAPCD Rule 410 – Organic Solvents (Amended 9/1/22)	SMAQMD Rule 441 – Organic Solvents (Adopted 12/6/78)	BAAQMD Rule 8-4 – General Solvent and Surface Coating Operations (Amended 10/16/02)
Applicability	Use of VOC-containing materials or equipment that emit VOC, including, but not limited to, coatings, resins, adhesives, inks, solvents, thinners, diluents, mold seal and release compounds, lubricants, cutting oils and quenching oils. Equipment and materials used in coating, adhesive, and ink application equipment, metal forming, casting, or forging operations	Any source operation that uses organic solvents	Any source operation emitting VOC from the use of organic solvents	Emissions of organic solvents that may result from the use of organic solvents	Operations using solvents and surface coatings other than those specified by other Regulation 8 rules. Applies to model making, printed circuit board manufacturing and assembly, electrical and electronic component manufacturing, surface coating of test panels, training facilities where the application of coating is for training purposes, stencil coatings, low usage coating activities exempt from other Regulation 8 Rules, coatings specifically exempt from other Regulation 8 Rules or solvent usage not specified by other Regulation 8 Rules
Exemptions	Any operation that emits VOC and is	Manufacture of organic solvents, or the	Manufacture, transport, or storage of	Manufacture of organic solvents, or the	Surface preparation of material subject to

TABLE 4-25.1 – General Usage of Solvents

Rule Element	South Coast AQMD Rule 442 – Usage of Solvents (Amended 12/15/00)	SJVAPCD Rule 4661 – Organic Solvents (Amended 9/20/07)	EKAPCD Rule 410 – Organic Solvents (Amended 9/1/22)	SMAQMD Rule 441 – Organic Solvents (Adopted 12/6/78)	BAAQMD Rule 8-4 – General Solvent and Surface Coating Operations (Amended 10/16/02)
	subject to a Regulation XI rule • Manufacture, transport, or storage of organic solvents, or the transport or storage of materials containing organic solvents • VOC emissions from VOC-containing materials or equipment subject to other Regulation IV rules (except Rule 481 – Spray Coating Operations) or which are exempt from air pollution control requirements • Use of pesticides, including insecticides, rodenticides, or herbicides • Aerosol products	transport of organic solvents or materials containing organic solvents • Any source operation subject to other source-specific VOC rules • Spraying or other employment of insecticides, pesticides or herbicides • Employment, application, evaporation, or drying of saturated halogenated hydrocarbons (HCs) or PERC • Use of any material meeting all the following conditions: ○ Volatile content consists only of water and organic solvents ○ Organic solvent content comprises not more than 20% of total volatile content	organic solvents, or the transport or storage of materials containing organic solvents • Coatings, coating removers (strippers), surface preparation material, and cleanup material subject to other Regulation IV rules • The spraying or other employment of insecticides, pesticides or herbicides • The employment, application, evaporation or drying of saturated halogenated HCs or PERC • The use of any material meeting all the following conditions: ○ Volatile content consists only of water and organic solvents ○ Organic solvent content comprises	transport or storage of organic solvents or materials containing organic solvents • Spraying or other employment of insecticides, pesticides, or herbicides • employment, application, evaporation or drying of saturated halogenated HCs or PERC • Use of any material, machine, equipment or other contrivance that meet all the following: ○ Volatile content consists only of water and organic solvents ○ Organic solvent content comprises not more than 20% of total volatile content ○ Volatile content is photochemically not reactive	specific requirements of other rules • Surface coating operations using non-refillable aerosol containers • Film cleaning operations that use 1,1,1-trichloroethane exclusively • Limited exemption to specific surface preparation and cleaning operations • Moving and working surfaces of machinery used for product development and in production

TABLE 4-25.1 – General Usage of Solvents

Rule Element	South Coast AQMD Rule 442 – Usage of Solvents (Amended 12/15/00)	SJVAPCD Rule 4661 – Organic Solvents (Amended 9/20/07)	EKAPCD Rule 410 – Organic Solvents (Amended 9/1/22)	SMAQMD Rule 441 – Organic Solvents (Adopted 12/6/78)	BAAQMD Rule 8-4 – General Solvent and Surface Coating Operations (Amended 10/16/02)
		○ Volatile content is photochemically not reactive ○ Organic solvent does not contact with flame	○ not more than 20% of total volatile content ○ Volatile content is photochemically not reactive ○ Organic solvent does not contact with flame • Disinfectants	○ Organic solvent does not contact with flame	
VOC Emissions Limit and Emission Control Requirements	VOC emissions limit • 833 lbs/month per facility Emission control equipment, meeting the requirements listed below, can be used as an alternative compliance pathway • 85.5% overall reductions • Output concentration <50 ppm as carbon with no dilution	VOC emissions limit from solvents subjected to heat • 15 lb VOC/day per operation Emission control equipment • 85% overall reductions Photochemically reactive solvents VOC emissions • 40 lb/day per operation Non-photochemically reactive solvents VOC emissions • 3,000 lb/day per operation	VOC emissions limit • 450 lbs/month per facility Emission control equipment • 85% overall reductions Solvents Subjected to Heat VOC emissions • 40 lb/day per operation or use of emission control equipment Photochemically reactive solvents VOC emissions • 40 lb/day per operation or use of emission control equipment	Organic materials VOC emission limits • 15 lb/day or 3.1 lb/hr per operation Photochemically reactive solvents VOC emission limits • 39.7 lb/day or 7.9 lb/hr per operation Non-photochemically reactive solvents VOC emission limits • 2,970 lb/day or 441 lb/hr per operation Emission control equipment • 85% overall control	Solvents or surface coating VOC emissions • 5 tons/year from any source Emission control equipment • 85% overall control

TABLE 4-25.1 – General Usage of Solvents

Rule Element	South Coast AQMD Rule 442 – Usage of Solvents (Amended 12/15/00)	SJVAPCD Rule 4661 – Organic Solvents (Amended 9/20/07)	EKAPCD Rule 410 – Organic Solvents (Amended 9/1/22)	SMAQMD Rule 441 – Organic Solvents (Adopted 12/6/78)	BAAQMD Rule 8-4 – General Solvent and Surface Coating Operations (Amended 10/16/02)
			Non-photochemically reactive solvents VOC emissions 3,000 lb/day per operation or use of emission control equipment		

TABLE 4-25.2 – Solvent Degreasing

Rule Element	South Coast AQMD Rule 1122 – Solvent Degreasers (Amended 5/1/09)	SJVAPCD Rule 4662 – Organic Solvent Degreasing (Amended 9/20/07)	SMAQMD Rule 454 – Degreasing Operations (Amended 9/25/08)	VCAPCD Rule 74.6 – Surface Cleaning and Degreasing (Amended 11/10/20)
Applicability	Batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing VOC or with a NESHAP halogenated solvent. Solvent degreasing operations that are regulated by this rule include, but are not limited to, the removal of contaminants from parts, products, tools, machinery, and equipment	All organic solvent degreasing operations	Solvent degreasing operations	Solvent cleaning activities (application equipment cleanup and all other cleanup of uncured coatings, adhesives, inks, or resins)
Exemptions	Degreasers using cleaning materials that contain ≤ 25 g/L	- Any degreaser which uses: - Unheated non-halogenated solvent	Degreasers which use solvents that contain ≤ 25 g/L VOC	Use of solvent with a VOC content of ≤ 25 g/L

TABLE 4-25.2 – Solvent Degreasing				
Rule Element	South Coast AQMD Rule 1122 – Solvent Degreasers (Amended 5/1/09)	SJVAPCD Rule 4662 – Organic Solvent Degreasing (Amended 9/20/07)	SMAQMD Rule 454 – Degreasing Operations (Amended 9/25/08)	VCAPCD Rule 74.6 – Surface Cleaning and Degreasing (Amended 11/10/20)
	with no NESHAP halogenated solvents - Batch-loaded cold cleansers or vapor degreasers with open-top surface area <1 square feet or with a capacity of <2 gallons - Emission collection and control system have overall 85% efficiency or have an output <50 ppm as carbon - No NESHAP halogenated solvents are used - VOC emissions from all the equipment do not exceed 22 lb/month per facility - Other applicable exemptions	- Open top surface area <1 square feet or with a capacity <2 gallons - A solvent usage <5 gal/month - Non-halogenated cleaning material having a VOC content of ≤25 g/L solvent - Other applicable exemptions	including water and exempt compounds Other applicable exemptions	
Requirements	VOC content for a batch-loaded or a conveyorized cold cleaner 25 g/L or less Other operational requirements	VOC content for a cold cleaner 25 g/L or less Other operational requirements	VOC content for a non-vapor degreaser 25 g/L or less including water and exempt compounds Other operational requirements	Maximum VOC content of solvent cleaning activity - Application equipment cleanup and all other cleanup of uncured coatings, adhesives, inks, or resins: 25 g/L - Cleaning of electronic components, electrical apparatus, or aerospace components conducted inside a degreaser: 100 g/L - Medical devices and pharmaceuticals, including repair and maintenance of tools, equipment and machinery: 800 g/L

TABLE 4-25.2 – Solvent Degreasing				
Rule Element	South Coast AQMD Rule 1122 – Solvent Degreasers (Amended 5/1/09)	SJVAPCD Rule 4662 – Organic Solvent Degreasing (Amended 9/20/07)	SMAQMD Rule 454 – Degreasing Operations (Amended 9/25/08)	VCAPCD Rule 74.6 – Surface Cleaning and Degreasing (Amended 11/10/20)
				• Medical devices and pharmaceuticals – general work surfaces cleaning: 600 g/L • All other solvent cleaning: 25 g/L Other applicable requirements

TABLE 4-25.3 – Solvent Cleaning Operations					
Rule Element	South Coast AQMD Rule 1171 – Solvent Cleaning Operations (Amended 5/1/09)	SJVAPCD Rule 4663 – Organic Solvent Cleaning, Storage, and Disposal (Amended 9/20/07)	SMAQMD Rule 466 – Solvent Cleaning (Amended 10/28/10)	BAAQMD Rule 8-16 – Solvent Cleaning Operations (Amended 10/16/02)	VCAPCD Rule 74.6 – Surface Cleaning and Degreasing (Amended 11/10/20)
Applicability	All persons who use solvent materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas; all persons who store and dispose of these materials used in solvent cleaning operations; and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations	Any organic solvent cleaning performed outside a degreaser during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or in general work areas at stationary sources. Also applies to the storage and disposal of all solvents and waste solvent materials at stationary sources	Persons who use VOC-containing materials in solvent cleaning operations during the production, repair, maintenance or servicing of parts, products, tools, machinery, or equipment, or in general work areas, and to all persons who store and dispose of VOC-containing materials used in solvent cleaning. Also applies to sellers of VOC-containing materials for use in solvent cleaning operations, and to all persons who use VOC-containing materials for the sterilization of food manufacturing and processing equipment	Solvent cleaning operations including wipe cleaning, used to clean or dry metal and non-metal surfaces typically using a cold, vapor or conveyORIZED solvent cleaner	Any person who performs solvent cleaning activities, and any person who manufactures or supplies solvents for use in solvent cleaning activities

Rule Element	South Coast AQMD Rule 1171 – Solvent Cleaning Operations (Amended 5/1/09)	SJVAPCD Rule 4663 – Organic Solvent Cleaning, Storage, and Disposal (Amended 9/20/07)	SMAQMD Rule 466 – Solvent Cleaning (Amended 10/28/10)	BAAQMD Rule 8-16 – Solvent Cleaning Operations (Amended 10/16/02)	VCAPCD Rule 74.6 – Surface Cleaning and Degreasing (Amended 11/10/20)
Exemptions	• Cleaning operations using a solvent containing no more than 25 g/L of material • Medical device and pharmaceutical facilities using up to 1.5 gal/day of solvent • Cleaning of adhesive application equipment used for thin metal laminating operations provided the clean-up solvent used contains no more than 950 g VOC/L • Cleaning of electronic or electrical cables provided the clean-up solvent used contains no more than 400 g VOC/L • Touch up cleaning performed on printed circuit boards provided the solvent used contains no more than 800 g VOC/L • Other exemptions apply	• Operator using ≤55 gal of organic solvent products in all source operations subject to Rule 4663 in a stationary source, in any rolling, consecutive 365-day period • Cleaning of architectural coating application equipment provided the cleaning solvent used does not exceed 950 g VOC/L • Other exemptions apply	• Cleaning using solvents that contain ≤25 g/L • Cleaning of sterilization ink indicating equipment provided the solvent usage is <1.5 gal/day • Other exemptions apply	• Equipment or operations that use unheated solvent and that contain <1 gal of solvent • Other exemptions apply	Use of solvent with a VOC content of 25 g/L or less
Emission Control Requirements	• Overall 85% control efficiency • Output concentration <50 ppm	• Overall 85% control efficiency • Output concentration <50 ppm	• Overall 85% control efficiency • Output concentration <50 ppm	None listed	• Overall 85% control efficiency

Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1171	SJVAPCD Rule 4663 Rule 4607	SMAQMD Rule 466 Rule 450	BAAQMD Rule 8-16 Rule 8-20	VCAPCD Rule 74.6 Rule 74.19
	Product cleaning during manufacturing process or surface preparation for coating, adhesive, or ink application VOC limits					
	General	25	25	25	-	25
	Electrical apparatus components & electronic components	100	100	100	-	100
	Medical devices & pharmaceuticals	800	800	800	-	800
	Repair & maintenance cleaning					
	General	25	25	25	-	25
	Electrical apparatus components & electronic components	100	100	100	-	100
	Medical devices & pharmaceuticals – Tools, equipment & machinery	800	800	800	-	800
	Medical devices & pharmaceuticals – General work surfaces	600	600	600	-	600
	Cleaning of coatings or adhesives application equipment	25	25	25	-	25
	Cleaning of ink application equipment					
	General	25	25	25	25	25
	Flexographic printing	25	25	25	25	25
	Gravure printing – Publication	100	100	-	100	100
	Gravure printing – Packaging	25	25	-	25	25
	Lithographic (offset) or letter press printing – Roller wash, blanket wash, & on-press components	100	100	100	100	100
	Lithographic (offset) or letter press printing – Removable press components	25	25	25	-	25
	Screen printing	100	100	100	100	-
	Ultraviolet ink/electron beam ink application equipment (except screen printing)	100	100	100	100	100
	Specialty flexographic printing	100	100	100	100	100
	Cleaning of polyester resin application equipment	25	-	-	-	25

3. Coatings and Related Processes

a. Overview

Major source category 230 – Coatings and Related Processes includes various VOC-emitting operations including auto refinishing, marine coatings, paper coatings, fabric coatings, metal parts and products coatings, wood furniture and fabricated products coatings, plastic parts coatings, semiconductor coatings, aircraft and aerospace coatings, thinning and cleanup solvent uses, preparation solvent uses, and other coating and related processes. This source category accounts for 21.01 tpd of VOC and zero NO_x in the Basin's 2037 emissions inventory as shown in Table 4-26.

TABLE 4-26
COATINGS AND RELATED PROCESSES EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Source Category	VOC (tpd)
216 – Preparation Solvents	0.11
218 – Auto Refinishing	9.88
220 – Marine Coatings	0.18
222 – Paper Coatings	0.34
226 – Metal Furniture and Fixture Coatings	0.00
228 – Can and Coil Coatings	0.68
230 – Metal Parts and Products Coatings	6.19
232 – Wood Furniture and Fabricated Products Coatings	1.38
234 – Flatwood Products	0.03
236 – Plastic Parts	0.42
237 – Semiconductor Coatings	0.01
238 – Aircraft and Aerospace Coatings	1.73
240 – Thinning and Cleanup Solvent Uses	0.02
995 – Other	0.04
Total	21.01

b. Evaluation

i. Metal Products Coating Operations

South Coast AQMD Rule 1107 applies to metal coatings and is compared with applicable rules in other air districts in Table 4-27. The requirements and VOC limits for the metal coatings rules in South Coast AQMD, BAAQMD, SJVAPCD, and SMAQMD are identical for the most part. BAAQMD, SJVAPCD, and SMAQMD allow some annual non-compliant material use that South Coast AQMD does not. Also, BAAQMD and SMAQMD exempt Touch Up and Repair coatings from VOC limits. Staff did not identify any potential contingency measures for metal products coating operations since evaluation of South Coast AQMD Rule 1107 revealed that it is the most stringent. Rule 1107 is currently undergoing an amendment process with the primary intent of phasing out toxic compounds, para-Chlorobenzotrifluoride (pCBtF) and tert-Butyl Acetate (t-BAC),

which may result in temporary VOC emission increases to accommodate reformulation.⁴⁵ The public health benefits from removing these carcinogens far outweigh any short-term emission increases. As of January 2025, to the best of staff's knowledge, South Coast AQMD is the only air district actively pursuing the phase-out of pCBtF and t-BAc, positioning it as a leader in this effort. As part of the rule amendment process, staff is also expected to assess the feasibility of lowering VOC limits at future compliance dates which will likely result in an overall reduction in VOC emissions. The phase out of pCBtF and t-Bac and lowering VOC limits will be implemented as soon as feasible following the adoption of the rule, therefore, no contingency measures are proposed for this category.

TABLE 4-27
RULE 1107 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1107 – Coating of Metal Parts and Products (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	BAAQMD Rule 8-19 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/16/02)	SMAQMD Rule 451 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/28/10)
Applicability	Coating of metal parts and products excluding aerospace assembly, magnet wire, marine craft, motor vehicle, metal container, and coil coating operations, or for architectural components coated at the structure site	Surface coating operations of metal parts or products, large appliances parts or products, metal furniture excluding aerospace, motor vehicle assembly	Miscellaneous coating operations on metal parts and products	Miscellaneous coating operations on metal parts and products
VOC Limits	VOC limits by individual coating category; use of add-on controls allowed in lieu of VOC limits	VOC limits by individual coating category; use of add-on controls allowed in lieu of VOC limits; 55 gallons per year of	VOC limits by individual coating category; use of add-on controls allowed in lieu of VOC limits; 100	VOC limits by individual coating category; use of add-on controls allowed in lieu of VOC limits; 55

⁴⁵ South Coast AQMD, Proposed Amended Rule 1107 – Coating of Metal Parts and Products.
<https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1107>

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Rule Element	South Coast AQMD Rule 1107 – Coating of Metal Parts and Products (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	BAAQMD Rule 8-19 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/16/02)	SMAQMD Rule 451 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/28/10)
		non-compliant coatings allowed	gallons per year of non-compliant coatings allowed	gallons per year of non-compliant coatings allowed
VOC Content Limits (g/L) Air-Dried/Baked				
General One Component	275	340/275	340/275	340/275
General Multi-Component	340/275	340/275	340/275	340/275
Military Specification	340/275	340/275	340/275	-
Etching Filler	420	-	-	420
Solar Absorbent	420/360	420/360	420/360	420/360
Heat-Resistant	420/360	420/360	420/360	420/360
Extreme High-Gloss	340/360	420/360	420/360	420/360
Metallic	420/360	420/360	420/360	420
Extreme Performance	420/360	420/360	420	420/360
Prefabricated Architectural One-Component	275	340/275	340/275	420/275
Prefabricated Architectural Multi-Component	340/275	340/275	340/275	420/275
Touch Up	420/360	420/360	Exempt	Exempt
Repair	420/360	420/360	Exempt	Exempt
Silicone Release	420	420	420	420
High-Performance Architectural	420	-	420	420

Rule Element	South Coast AQMD Rule 1107 – Coating of Metal Parts and Products (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	BAAQMD Rule 8-19 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/16/02)	SMAQMD Rule 451 – Surface Coating of Miscellaneous Metal Parts and Products (Amended 10/28/10)
Camouflage	420/360	420/360	420/360	420/360
Vacuum-Metalizing	420	-	420/360	-
Mold-Seal	420	-	-	-
High-Temperature	420	-	420	-
Electric-Insulating Varnish	420	-	-	340/275
Pan Backing	420	-	-	-
Pretreatment Coatings	420	420	420	420
Transfer Efficiency	Use of HVLP [^] or equivalent transfer efficiency	Use of HVLP [^] or equivalent transfer efficiency	Use of HVLP [^] or equivalent transfer efficiency	Use of HVLP [^] or equivalent transfer efficiency
Work Practices	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning

[^]High-Volume, Low-Pressure (HVLP)

ii. Aerospace Coating Operations

South Coast AQMD Rule 1124 applies to aerospace coating operations and is compared with the applicable rules in other air districts in Table 4-28.

The requirements and VOC limits for the metal coatings rules in South Coast AQMD and SJVAPCD are identical for the most part. SJVAPCD includes higher VOC limits for specialty categories (e.g., Ablative, Bearing, Caulking and Smoothing, Chemical Acid Resistance, Electric Interference, Intermediary Release, Lacquer, Part Marking, Rocket Motor Nozzle, Screen Print Ink, Silicone Insulation, Specialized Function, Thermal Control, Epoxy Polyamide, and Wet Fastener). South Coast AQMD's rule is more stringent with respect to these specialty categories.

BAAQMD's regulation was last updated in 1995 and generally has higher limits and fewer categories. High volume categories in South Coast AQMD are more stringent but there are a few specialty categories where BAAQMD may have a lower limit. Staff reviewed the availability of products in those categories and found that products were not available for commercial, military, and spacecraft at the VOC contents specified in BAAQMD's rule for all applications. In some cases, the products relied on the European Union definition of VOC which is not applicable to South Coast AQMD. Additionally, these products were not found to be usable in spray, dip, and brush applications which are typical of aerospace operations. SMAQMD has fewer specialty categories resulting in lower limits for certain applications but mostly higher limits across the board. Like the BAAQMD, SMAQMD's rule has not been updated since 2008.

South Coast AQMD Rule 1124 generally has the most stringent limits in place. Rule 1124 is currently being amended with the primary intent of phasing out toxic compounds, pCBtF and t-BAc, which may temporarily increase VOC emissions to accommodate reformulation.⁴⁶ However, the public health benefits of removing these carcinogens far outweigh any short-term emissions impact. As of January 2025, to the best of staff's knowledge, South Coast AQMD is the only air district actively pursuing the phase-out of pCBtF and t-BAc, positioning it as a leader in this effort. As part of the rule amendment process, staff will also evaluate the feasibility of lowering VOC limits at future compliance dates which will likely achieve overall VOC reductions. The phase out of pCBtF and t-BAc and lowering VOC limits will be implemented as soon as feasible following the adoption of the rule, therefore, no contingency measures are proposed for this category.

TABLE 4-28
RULE 1124 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
Applicability	Assembly and component manufacturing operations	Manufacturing, assembly, coating, and cleaning of aerospace components	Surface preparation and coating of aerospace components and cleanup of aerospace coating equipment	Coatings of aerospace components including coating removal, surface preparation and cleaning

⁴⁶ South Coast AQMD, Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations. <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1124>

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
VOC Limits	VOC limits by individual coating category; use of add-on controls allowed if lieu of VOC limits	VOC limits by individual coating category; use of add-on controls allowed if lieu of VOC limits; 20 gallons per year of non-compliant coatings allowed	VOC limits by individual coating category; use of add-on controls allowed if lieu of VOC limits; 100 gallons per year of non-compliant coatings allowed	VOC limits by individual coating category; use of add-on controls allowed if lieu of VOC limits
General Primer	350	350	350	350
Low-Solids Corrosion Resistant Primer	350	350	-	-
Pretreatment Primer	780	780	-	780
Rain Erosion Resistant Coating Compatible Primer	850	N/A	-	-
Adhesion Promoter	250	850	-	780
Adhesive Bonding Primer – New Aircraft	250	250	850	-
Adhesive Bonding Primer – Military Aircraft	805	805	-	-
Adhesive Bonding Primer – Remanufactured Commercial Aircraft Parts	805	805	-	-
Adhesive Bonding Primer – Sonic and Acoustic Applications	805	805	-	-

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
Adhesive Bonding Primer	250	250	780	-
Topcoat	420	420	420/340	-
Clear Topcoat	520	520	-	-
Unicoat	420	420	-	-
Wing Coating	750	750	-	-
Impact Resistant Coating	420	420	-	-
High-Temperature	850	850	720	420
Antichafe	600	600	-	-
Rain Erosion Resistant Coating	800	800	-	800
Conformal	750	750	420	600
Optical Anti Reflective	700	700	-	-
Scale Inhibitor	880	880	-	-
Metallized Epoxy	700	740	-	-
Electric or Radiation Effect	800	800	800	600
Temporary Protective	250	250	250	250
Fuel Tank	420	420	720	650
Mold Release	780	780	-	762
Flight Test – Missiles	420	420	-	420
Flight Test – All Others	840	600	-	420
Fire Resistant - Commercial	650	650	-	600
Fire Resistant – Military	970	N/A	-	600
Wire Coatings – Phosphate Ester Resistant Ink	925	925	-	-
Wire Coatings – Other	420	420	-	-

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
Space Vehicle – Electrostatic Discharge Protection	800	800	-	880
Space Vehicle - Other	1000	1000	-	1000
Non Structural Adhesive	250	250	-	600
Structural Adhesive - Autoclavable	50	50	-	600
Structural Adhesive – Non-Autoclavable	850	850	-	600
Space Vehicle Adhesive	800	800	-	600
Fuel Tank Adhesive	620	620	-	600
Fastener Sealant	675	600/675	600	600
Extrudable, Rollable or Brushable Sealant	600	280/600	600	600
Other Sealant	600	N/A	-	600
Maskant for Chemical Processing	250	250	-	-
Maskant for Chemical Milling Type 1	250	250	-	622
Maskant for Chemical Milling Type II	160	250	-	160
Photolithographic Maskant	850	-	-	850
Touch Up, Line Sealer Maskant	750	-	-	850

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
Fastener Installation Solid-Film Lubricant	880	880	-	880
Fastener Installation Dry Lubricative Material	675	880	-	-
Fastener Manufacturing Solid Film Lubricant	250	250	-	880
Fastener Manufacturing Dry Lubricative Material	120	120	-	-
Fastener Manufacturing Barrier Coating	420	250	-	-
Non-Fastener Solid Film Lubricant	880	880	-	880
Non-Fastener Dry Lubricative Material	675	675	-	-
Transfer Efficiency	Use of HVLP or equivalent transfer efficiency	Use of HVLP or equivalent transfer efficiency	Use of HVLP or equivalent transfer efficiency	Use of HVLP or equivalent transfer efficiency
Work Practices	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning	Storage, use, and disposal of coatings and waste; VOC limits and work practices for solvent cleaning
Surface Cleaning	200 g/L or 45 mm Hg	200 g/L or 45 mm Hg	None	200 g/L or 45 mm Hg

Rule Element	South Coast AQMD Rule 1124 – Aerospace Assembly Line Coating Operations (Amended 9/21/01)	SJVAPCD Rule 4605 – Aerospace Assembly and Component Coatings (Amended 6/16/11)	BAAQMD Rule 8-29 – Aerospace Assembly and Component Coating Operations (Amended 12/20/95)	SMAQMD Rule 456 – Aerospace Assembly and Component Coating Operations (Amended 10/23/08)
Stripping	300 g/L or 9.5 mm Hg	300 g/L or 9.5 mm Hg	400 g/L or 10 mm Hg	300 g/L or 9.5 mm Hg

iii. Wood Products Coating Operations

South Coast AQMD Rule 1136 applies to the wood products coating operations and is compared with other air district rules in Table 4-29. Table 4-30 summarizes and compares the VOC limits for wood coatings in South Coast AQMD with the rules in other air districts.

TABLE 4-29
CONTROL MEASURES IMPLEMENTED BY SOUTH COAST AQMD AND OTHER DISTRICTS FOR
WOOD COATING

Rule	Applicability	Control Measure
South Coast AQMD Rule 1136 – Wood Products Coatings (Amended 6/14/96)	Applies to the application of coatings or strippers to, and surface preparation of, any wood products, including furniture, cabinets, shutters, frames, and toys	- VOC content limit ranges from 120 to 750 g/L VOC (e.g., Low-Solid Stains limit 120 g/L) - Averaging provisions and add-on control are allowed - At least 65% transfer efficiency is required, otherwise the use of additional control equipment must be used (e.g., HVLP equipment)
BAAQMD Rule 8-32 – Wood Products Coatings (Amended 8/5/09)	Applies to the coating of wood products, including surface preparation, application of coatings and cleanup	- VOC content limit ranges from 120 to 550 g/L VOC (No mold seal application limit) (e.g., Low-Solid Stains limit 120 g/L) - Emissions to the atmosphere must be controlled with an abatement device efficiency of at least 85% instead of complying with VOC content limits
MDAQMD Rule 1114 – Wood Products Coating Operations (Amended 8/24/20)	Applies to wood products coating application operations	- VOC content limit ranges from 120 to 750 g/L VOC (e.g., Low-Solid Stains limit 120 g/L) - Allows alternative in lieu of complying with the VOC content limits with a capture and control system of combined efficiency of at least 90%
SJVAPCD Rule 4606 – Wood Products and Flat Wood Paneling Products Coating Operations (Amended 10/16/08)	Applies to the application of coatings to wood products, including furniture, cabinets, flat wood paneling, and custom replica furniture	- VOC content limit ranges from 120 to 750 g/L VOC (e.g. Low -Solid Stains limit 120 g/L) - Allows alternative in lieu of complying with the VOC content limits with control system of efficiency of at least 85% by weight for wood product coating

TABLE 4-30
RELEVANT VOC CONTENT LIMITS IN COATINGS BY SOUTH COAST AQMD AND OTHER DISTRICT FOR
WOOD COATINGS

Type of Coating	South Coast AQMD Rule 1136 VOC Limit, g/L	MDAQMD Rule 1114 VOC Limit, g/L	SJVAPCD Rule 4606 VOC Limit, g/L	BAAQMD Rule 8-32 VOC Limit, g/L
Clear Sealers	275	275	275	275
Clear Topcoat	275	275	275	275
Fillers	275 (All Products)	275 (New Products) 500 (Refurbished)	275 (All Products)	275 (All Products)
High-Solids Stain	350 (All Products)	240 (New Products) 700 (Refurbished)	240 (All Products)	350 (All Products)
Inks	500	500	500	500
Low-Solid Stain	120	120	120	120
Mold-Seal Coating	750	750	750	-
Multi-colored Coatings	275 (All Products)	275 (New Products) 700 (Refurbished)	275 (All Products)	275 (All Products)
Pigmented Primers, Sealers, & Undercoats	275	275	275	275
Pigmented Topcoats	275	275	275	275

The control measures identified rely on similar control measures among South Coast AQMD and other air districts as shown in Table 4-29. Furthermore, the requirements set by Rule 1136 are very similar to those identified in MDAQMD, SJVAPCD, and BAAQMD which include similar VOC content limits for wood coatings application and an alternative to install a control emission system in lieu of meeting the VOC content limits.

South Coast AQMD's Rule 1136 requirements are generally as stringent as those in other districts' rules, although SJVAPCD Rule 4606 contains a more stringent high-solids stain limit (240 g/L vs. 350 g/L) for all products. Rule 1136 is currently undergoing an amendment process with the primary intent of phasing out toxic compounds, pCBtF and t-BAC. Although this may lead to a temporary increase in VOC emissions due to reformulation,⁴⁷ the significant public health benefits of eliminating these carcinogens far outweigh any short-term VOC emission increases. As of January 2025, to the best of staff's knowledge, South Coast AQMD is the only air district actively pursuing the phase-out of pCBtF and t-BAC, positioning it as a leader in this effort. As part of the rule amendment process, staff will also assess the feasibility of lowering VOC limits at future compliance dates, which is expected to reduce VOC emissions overall. The phase out of pCBtF and t-BAC and lowering VOC limits will be implemented as soon as feasible following the adoption of the rule, therefore, no contingency measures are proposed for this category.

⁴⁷ South Coast AQMD, Proposed Amended Rule 1136 – Wood Products Coatings.
<https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1136>

iv. Flatwood Products

South Coast AQMD Rule 1104 applies to this source category. BAAQMD Rule 8-23 and SJVAPCD Rule 4606 also contain requirements specific to flatwood products. While other air districts implement general wood product coating rules, these rules do not have requirements specific to flatwood products. For an evaluation of general wood product coating rules, refer to the previous section.

Table 4-31 summarizes the control measures staff considered for this source category comparative analysis. South Coast AQMD Rule 1104 has the most stringent requirements and, therefore, no contingency measures are proposed.

TABLE 4-31
SOUTH COAST AQMD RULE 1104 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1104 – Wood Flat Stock Coating Operations (Amended 8/13/99)	BAAQMD Rule 8-23 – Coating of Flat Wood Paneling and Wood Flat Stock (Amended 12/20/95)	SJVAPCD Rule 4606 – Wood Products and Flat Wood Paneling Products Coating Operations (Amended 10/16/08)
Applicability	Applies to all persons applying coatings, inks, and adhesives to wood flat stock for the purpose of manufacturing a finished wood panel intended for attachment to the inside walls of buildings or a finished exterior wood siding intended for use in construction	Application of coatings and adhesives to flatwood panels and wood flat stock	Applies to operators of flat wood paneling coating operations
Application Method	Coatings, adhesives, or inks must be applied by: • Flow Coater, Roll Coater, or Dip Coater • Hand Application • HVLP Application • Electrostatic Application	No restrictions	Coatings, adhesives, or inks must be applied by: • Flow Coater, Roll Coater, or Dip Coater • Hand Application • HVLP Application • Electrostatic Application • Detailing or touch-up guns • Other methods demonstrated to achieve at least 65% transfer efficiency
Requirements	Comply with the specified VOC emission limit or operate an approved emission control device that reduces emissions by at least 95%, or the output of the control device is less than 50 ppm carbon, and has a collection efficiency of at least 90%	Comply with the specified VOC emission limit or operate an approved emission control device with a control efficiency of 90%	Comply with the specified VOC emission limit or operate an approved emission control device with a control efficiency of 90%
Emission Limit for coatings, inks, and adhesives in grams/liter, less	250	250	250

Rule Element	South Coast AQMD Rule 1104 – Wood Flat Stock Coating Operations (Amended 8/13/99)	BAAQMD Rule 8-23 – Coating of Flat Wood Paneling and Wood Flat Stock (Amended 12/20/95)	SJVAPCD Rule 4606 – Wood Products and Flat Wood Paneling Products Coating Operations (Amended 10/16/08)
water and exempt compounds			
Exemptions	- Laminating of fiberglass, metal, or plastic sheets to wood panels that is subject to the provisions of Rule 1168 - Coating of wood panels for furniture end use that is subject to the provisions of Rule 1136 - Coating of wood panels for aircraft that is subject to the provisions of Rule 1124	- Coatings subject to Regulation 8, Rule 32 - Coatings subject to Regulation 8, Rule 3	Operators whose total actual VOC emissions from flat wood paneling coating operations are less than 15 pounds per day of VOC are subject to the general wood product coatings emission limits (see previous section for analysis)

v. Solvent Thinning Operations

Consumer products are primarily regulated under the CARB Consumer Products Regulatory Program.⁴⁸ South Coast AQMD Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents was adopted in March 2009 and last amended on December 3, 2010 to reduce VOC emissions from paint thinners and multi-purpose solvents from products not yet regulated by CARB. South Coast AQMD Rule 1143 was compared to BAAQMD’s Rule 8-4 – General Solvent and Coating Operations and SJVAPCD’s Rule 4661 – Organic Solvents in Table 4-32.

In September 2009, CARB adopted an amendment to include multi-purpose solvents and paint thinners under the consumer products regulation. Since CARB’s consumer products regulation is statewide, CARB’s VOC limits for multi-purpose solvents and paint thinners preempt South Coast AQMD’s Rule 1143 VOC limits and are in effect for the Basin. More details can be found under the “Solvent Evaporation – Consumer Products” section of this Plan. Additionally, an infeasibility justification for consumer products regulated under CARB’s authority is presented in Appendix B: CARB’s Area Source Infeasibility Justification.

⁴⁸ CCR Title 17 § 94509

TABLE 4-32
SOUTH COAST AQMD RULE 1143 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents (Amended 12/3/10)	BAAQMD Rule 8-4 – General Solvent and Surface Coating Operations (Amended 10/16/02)	SJVAPCD Rule 4661 – Organic Solvents (Amended 9/20/07)
Applicability	Users, suppliers, and manufacturers of consumer paint thinners and multi-purpose solvents	Solvent and Coating Operations	Operations that use organic solvents
Requirements	• Consumer paint thinner – 25 g/L (2.5%) • Consumer multi-purpose solvent – 25 g/L (2.5%)	Surface coating – 420 g/L	Refers to Rule 4663 for VOC limits (which are $\geq$ 25 g/L – see Table 4-25.3)
Exemptions	• Solvents designated for cleanup of polyaspartic and polyurea coatings application equipment • Thinners designated for Industrial Maintenance, Zinc IM Primers, and High Temperature Coatings • Artist solvents/thinners designated to reduce viscosity of, or remove, art coating compositions or components	Exemptions listed in Table 4-25.1	Exemptions listed in Table 4-25.1

vi. Plastic, Rubber, Leather and Glass Coating Operations

South Coast AQMD Rule 1145 applies to plastic, rubber, leather and glass coating operations and is compared in Table 4-33 against applicable rules and guidance, which include U.S. EPA's CTG for Miscellaneous Metal and Plastic Parts Coatings, Antelope Valley AQMD (AVAQMD) Rule 1145 – Plastic, Rubber, and Glass Coatings, and BAAQMD Rule 8-31 – Surface Preparation of Plastic Parts and Products. Table 4-34 shows the VOC limits for plastic coatings in these rules by South Coast AQMD and other air districts.

TABLE 4-33
CONTROL MEASURES IMPLEMENTED BY SOUTH COAST AQMD AND OTHER DISTRICTS FOR PLASTIC COATINGS

Rule	Applicability	Control Measure
South Coast AQMD Rule 1145 – Plastic, Rubber, Leather, and Glass Coatings (Amended 12/4/09)	Applies to the application of coatings to any plastic, rubber, leather, or glass products	• Sets VOC limits ranging from 50 to 800 g/L depending on coating category or allows alternative compliance by using air pollution control equipment that: - Reduces VOC emissions from an emission collection system by at least 95% by weight or the concentration of VOC in the output of the air pollution control device is less than 50 ppm; and - Collects at least 90% by weight of the VOC emissions generated • Requires High transfer coating equipment (e.g., HVLP) • Solvent cleaning operations must comply with Rule 1171 – Solvent Cleaning Operations
U.S. EPA CTG for Miscellaneous Metal and Plastic Parts Coatings (Revised 9/2008)	Applies to facilities that perform surface coating operations to metal & plastic parts	• States that recommended limits in South Coast AQMD Rule 1145 are more stringent than in other existing federal, state and local actions limiting VOC emissions.
AVAQMD Rule 1145 – Plastic, Rubber, and Glass Coatings (Amended 2/14/97)	Applies to the application of coatings to any plastic, rubber, or glass	• Sets VOC limits ranging from 275 to 800 g/L depending on coating category; or • Able to comply with by using air pollution control equipment: - The control device reduces VOC emissions from an emission collection system by

Rule	Applicability	Control Measure
		at least 95% by weight or the concentration of VOC in the output of the air pollution control device is less than 50 ppm; and - The system, collects at least 90% by weight of the VOC emissions generated • Solvent cleaning operations must comply with Rule 1171 – Solvent Cleaning Operations • Requires High transfer coating equipment (e.g., HVLP)
BAAQMD Rule 8-31 – Surface Preparation and Coating of Plastic Parts and Products (Amended 10/16/02)	Applies to the surface preparation and coating of plastic parts and products, including polyester resin (fiberglass) products	• Sets VOC limit of 340 g/L of coating applied to plastic parts; or • Able to comply with by using air pollution abatement device with an efficiency of at least 85%

TABLE 4-34
RELEVANT VOC CONTENT LIMITS IN COATINGS BY SOUTH COAST AQMD AND OTHER
DISTRICTS FOR PLASTIC COATINGS

Type of Coating	South Coast AQMD Rule 1145 VOC Limit, g/L	AVAQMD Rule 1145 VOC Limit, g/L	BAAQMD Rule 8-31 VOC Limit, g/L
Electrical dissipating and shock free coatings	360	360	340
General one-component coatings	120	275	340
General two-component coatings	120	420	340
Metallic coatings	420	420	420
Military specification one-component coatings	340	340	340
Military specification two-component coatings	420	420	340
Mold seal coatings	750	750	-
Multi-color coatings	680	685	-
Optical coatings	50	800	800

The plastic coatings process controls identified fall into common categories. The requirements of the relevant South Coast AQMD rules are similar or more stringent in certain categories such as in general one-component coatings when compared with the requirements set by AVAQMD and BAAQMD as shown in Table 4-34. Furthermore, the 2008 CTG, released by the U.S. EPA, states that the South Coast AQMD recommended limits in Rule 1145 and Rule 1107 are more stringent than limits provided in other existing Federal, State, and local actions limiting VOC emissions from these coating categories. Due to the extensive size and diversity of regulated sources within the South Coast AQMD's jurisdiction, the facilities subject to South Coast AQMD's rules are considered representative of similar sources nationwide. The U.S. EPA recommends these limits as technologically and economically feasible for implementation across the country, implying that South Coast AQMD's rules are the most stringent. In all, the available control measures are already being implemented in the Basin and no contingency measures are proposed for this category.

vii. Motor Vehicle Assembly Line Coating Operations

South Coast AQMD Rule 1115 applies to this source category. Rule 1115 was last amended in March 2022 to address a Reasonably Available Control Technology (RACT) deficiency due to a less stringent VOC limit for Automobile and Light-Duty Truck Assembly Coatings compared to that specified in U.S. EPA's Control Techniques Guidelines. In addition, the VOC limits for several categories of coatings were lowered to match the stringency of other districts' rules.

Staff reviewed control measures for this source category implemented by South Coast AQMD and other state and local air agencies, including SJVAPCD Rule 4602, AVAQMD Rule 1151.1, and BAAQMD Rule 8-13. Table 4-35 summarizes the control measures staff considered for this source category comparative analysis.

TABLE 4-35
SOUTH COAST AQMD RULE 1115 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)	SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)	BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)	AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)
Applicability	An owner or operator engaged in assembly line coating operations conducted during the manufacturing of new motor vehicles and other automotive parts that are coated during the vehicle assembly process as well as during associated solvent cleaning operations.	Any person who applies VOC-containing coatings to new automobiles, light-duty trucks, heavier vehicles, and other parts coated along with these bodies or body parts during the assembly process, and associated solvent cleaning activities.	Light- and medium-duty motor vehicle assembly plants.	All Motor Vehicle Assembly Coating Operations that apply Coatings that contain VOC to new Motor Vehicles, new Light-Duty Trucks, new Heavier Vehicles and other parts that are coated along with these body or body parts during the vehicle assembly process and associated solvent cleaning activities.
Exemptions	The VOC emission and content limits do not apply to: • Wheel Topcoat Application • Antirust Coatings • Flexible Coatings • Plastic Parts	• Materials supplied in containers with a net volume of 16 fluid ounces or less, or a net weight of one pound or less. • Except record keeping requirements, the provisions of this rule shall not apply to an operation where the total VOC emissions from all motor vehicle assembly coating	None	• Any operation that is subject to the provisions of Rule 1151 - Motor Vehicle and Mobile Equipment Coating Operations • Materials supplied in containers with a net volume of 16 fluid ounces or less, or a net weight of 1 pound or less. • Except record keeping requirements, the

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)	SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)	BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)	AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)
		operations, including cleaning activities, at that facility are less than 6.5 kg/day (15 lb/day) before controls.		provisions of this rule shall not apply to an operation where the total VOC emissions from all motor vehicle assembly coating operations, including cleaning activities, at that facility are less than 6.5 kg/day (15 lb/day) before controls.
Alternative Compliance Options	In lieu of complying with the VOC content limits, an owner or operator may: - complete an Alternative Emission Control Plan pursuant to Rule 108 (Alternative Emission Control Plans); or - may use an approved emission control system for reducing VOC emissions. The approved emission control system shall reduce the VOC emissions by an equivalent or greater	In lieu of complying with VOC emission limits, coating application, and organic solvent cleaning requirements, an operator may use a VOC emission control system that meets the following requirements: - The VOC emission control system shall be approved by the APCO. - The VOC emission control system shall achieve an overall control efficiency of at least 90% by weight.	In lieu of complying with VOC emissions limits for electrodeposition, combined primer-surfacer and topcoat, and off-line coatings, an abatement device with at least 90% abatement efficiency must be used.	In lieu of complying with the VOC content limits, an operator may use an Emission Control System that meets all of the following requirements: - The Emission Control System shall be approved in writing by the APCO. - The approved Emission Control System shall achieve an overall capture and control efficiency of at least 90% by weight. - Use of an Emission

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)	SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)	BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)	AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)
	level to that which would have been achieved by complying with the content limits.	Use of a VOC emission control system shall result in VOC emissions equal to or less than VOC emissions which would result from compliance with the applicable requirements.		Control System shall result in VOC emissions equal to or less than VOC emissions which would result from compliance with the applicable requirements.
Coating Application Methods	An owner or operator of an assembly line coating operation shall not apply coatings to any motor vehicle or any associated parts or components to a motor vehicle on an assembly line except by the use of one of the following methods: - Electrostatic application - HVLP spray - Brush, dip, or roller - Spray gun application - Any other automotive coating application methods approved by the Executive Officer capable of achieving equivalent or better transfer efficiency	The operator shall apply coatings using one of the following methods: - Brush, dip, or roll coating - Electrostatic application - Electrodeposition - Flow coating - Continuous Coating - Any coating method demonstrated to the APCO capable of achieving $\geq 65\%$ transfer efficiency - HVLP spray equipment - Spray equipment must meet HVLP equipment standards	-	The operator shall apply Coatings using one of the following methods: - Brush, Dip or Roll Coating - Electrostatic Application - Flow Coating - Continuous Coating - HVLP spray - Any other coating application method which is demonstrated to be capable of achieving equivalent or better transfer efficiency compared to HVLP spray.

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)		SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)	BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)	AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)
	compared to HVLP spray.				
Motor Vehicle Assembly Coatings	VOC Emission Limits				
Electrodeposition primer operations (including application area, spray/rinse stations, and curing oven)	Solids turnover ratio (R_T) > 0.16	0.084 kg VOC/L of solids deposited	0.084 kg VOC/L of coating solids	0.145 kg VOC/L of coating applied, excluding water, unless emissions are controlled by an air pollution abatement device with an efficiency of at least 90%	0.084 kg VOC/L of solids deposited
	$0.040 < R_T < 0.160$	$0.084 \times 350^{0.160-R_T}$ kg VOC/L	$0.084 \times 350^{0.160-R_T}$ kg VOC/L		$0.084 \times 350^{0.160-R_T}$ kg VOC/L
	$R_T < 0.040$	No VOC limit	No VOC limit		No VOC limit
Primer-surfacer operations (including application area, flash off area, and oven)	1.44 kg VOC/L of solids deposited		1.44 kg VOC/L of deposited solids on a daily weighted average basis as determined by following the procedures in the revised Automobile Topcoat Protocol	1.80 kg VOC/L of applied coating solids from each primer surfacer operation	1.44 kg VOC/L of solids deposited
Topcoat operations (including application area, flash-off area, and oven)	1.44 kg VOC/L of solids deposited		1.44 kg VOC/L of deposited solids on a daily weighted average basis	1.80 kg VOC/L of applied coating solids from each topcoat operation	1.44 kg VOC/L of solids deposited
Final repair operations	0.580 kg VOC/L of coating, excluding water and exempt compounds		0.58 kg VOC/liter, less water and less exempt solvents, on a daily weighted average basis or as an occurrence	0.580 kg VOC/L of coating applied, excluding water, on a daily weighted average basis	0.580 kg VOC/L of coating, excluding water and exempt compounds

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)	SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)	BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)	AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)
		weighted average		
Combined primer- surfacers and topcoat operations	1.44 kg VOC/L of solids deposited	1.44 kg VOC/L of deposited solids on a daily weighted average basis	-	1.44 kg VOC/L of solids deposited
Flexible Parts Coatings	-	-	A person shall not apply to any flexible part which has a VOC content in excess of the following limits, excluding water, unless emissions are controlled by an air pollution abatement device with 90% efficiency. - flexible primer: 490 grams/liter (4.1 lbs/gal) - color topcoat: 450 grams/liter (3.8 lbs/gal) - basecoat/clearcoat: 540 grams/liter (4.5 lbs/gal)	-
Spray Primer Operations	-	-	1.80 kg VOC/L of applied coating solids from each spray primer operation.	-
Off-Line Coatings	-	-	0.340 kg VOC/L of applied coatings, excluding water, unless emissions are controlled by an air pollution abatement device with 90% efficiency.	-

Rule Element	South Coast AQMD Rule 1115 – Motor Vehicle Assembly Line Coating Operations (Amended 3/4/22)		SJVAPCD Rule 4602 – Motor Vehicle Assembly Coatings (Amended 9/17/09)		BAAQMD Rule 8-13 – Light and Medium Duty Motor Vehicle Assembly Plants (Amended 12/20/95)		AVAQMD Rule 1151.1 – Motor Vehicle Assembly Coating Operations (Amended 6/20/17)		
VOC Content	Material Type	Rule 1115		SJVAPCD Rule 4602		BAAQMD Rule 8-13		AVAQMD Rule 1151.1	
Limits (grams/liter)	Glass bonding primer	900		900		-		900	
for Miscellaneous	Adhesive	250		250				250	
Materials Used at	Cavity wax	650		650				650	
Motor Vehicle	Sealer	650		650				650	
Assembly Coating	Deadener	650		650				650	
Operations	Gasket/gasket sealing material	200		200				200	
	Underbody coating	650		650				650	
	Trunk interior coating	650		650				650	
	Bedliner	200		200				200	
	Weatherstrip adhesive	750		750				750	
	Lubricating wax/compound	700		700				700	

Of the rules considered in this analysis, BAAQMD Rule 8-13 was the only rule that contained VOC emission limits for flexible parts coatings, spray primer operations, and off-line coatings. However, unlike other air districts, BAAQMD does not include VOC content limits for miscellaneous materials used in motor vehicle assembly operations. In addition, while BAAQMD Rule 8-13 does not explicitly list exemptions, it does not apply to the assembly of motorcycles and heavy-duty vehicles as defined in Section 1900, Title 13, California Code of Regulations. By contrast, South Coast AQMD Rule 1115 applies to the assembly of those vehicle classes. Overall, South Coast AQMD is just as stringent as other districts in regulating automotive coatings and no contingency measures are proposed.

viii. Motor Vehicle Non-Assembly Line Coating Operations

South Coast AQMD Rule 1151 applies to this source category. Note that this category is distinct from motor vehicle assembly line coating operations, which was discussed in the previous section.

Staff reviewed control measures for this source category implemented by South Coast AQMD and other state and local air agencies, including Santa Barbara County APCD (SBCAPCD) Rule 339, San Diego County APCD (SDAPCD) Rule 67.20.1, BAAQMD Rule 8-45, SJVAPCD Rule 4612, SMAQMD Rule 459, and CARB. Each jurisdiction has different rule structures, which can make direct comparison difficult. Tables 4-36 and 4-37 below summarize the control measures staff considered for this source category comparative analysis.

TABLE 4-36
SOUTH COAST AQMD RULE 1151 COMPARATIVE ANALYSIS

Rule	Applicability	Control Measure
South Coast AQMD Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (Amended 11/1/24)	Any person who supplies, sells, offers for sale, markets, manufactures, blends, packages, repackages, possesses or distributes any automotive coating, automotive coating component, or associated solvent for use within the South Coast AQMD, as well as any person who uses, applies, or solicits the use or application of any automotive coating, automotive coating component, or associated solvent within the South Coast AQMD	The rule contains various VOC content limits that apply to different types of automotive refinishing coatings based on use and purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds Rule provides an alternative compliance option allowing for the use of an approved emission control system, consisting of collection and control devices, only if the VOC emissions resulting from the use of non-compliant automotive coatings will be reduced to a level equivalent

Rule	Applicability	Control Measure
		to or lower than that which would have been achieved by compliance with VOC content limits
SBCAPCD Rule 339 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/19/08)	This rule is applicable to any person who supplies, sells, offers for sale, manufactures, or distributes any automotive coating or associated solvent for use within the jurisdiction, as well as any person who uses, applies, or solicits the use or application of any automotive coating or associated solvent within the jurisdiction. The purpose of this rule is to limit VOC emissions from coatings and solvents associated with the coating of motor vehicles, mobile equipment, and associated parts and components	The rule contains various VOC content limits that apply to different types of automotive refinishing coatings based on use and purpose Rule provides an alternative compliance option allowing for the use of an approved emission control system, which achieves an overall control efficiency of at least 85%
SDAPCD Rule 67.20.1 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/30/10)	This rule is applicable to: (i) All motor vehicle and mobile equipment coating operations including finishing or refinishing of motor vehicles, mobile equipment, non-motorized models, and their associated parts and components (ii) All cleaning operations associated with motor vehicle and mobile equipment coating operations (iii) Any person who supplies, sells, offers for sale, manufactures, or distributes any automotive coating or associated cleaning material for use within San Diego County	The rule contains various VOC content limits that apply to different types of automotive refinishing coatings based on use and purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds Rule provides an alternative compliance option allowing for the use of an approved emission control system, which achieves an overall control efficiency of at least 85% by weight
BAAQMD Rule 8-45 – Motor Vehicle and Mobile Equipment Coating	The purpose of this rule is to limit the emission of volatile organic compounds from the	The rule contains various VOC content limits that apply to different types of automotive

Rule	Applicability	Control Measure
Operations (Amended 12/3/08)	finishing or refinishing of motor vehicles, mobile equipment and their parts and components	refinishing coatings based on use and purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds
SJVAPCD Rule 4612 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 10/21/10)	This rule is applicable to any person who supplies, sells, offers for sale, manufacturers, or distributes any automotive coating for use within the jurisdiction, as well as any person who uses, applies, or solicits the use or application of any automotive coating within the jurisdiction	The rule contains various VOC content limits that apply to different types of automotive refinishing coatings based on use and purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds
SMAQMD Rule 459 – Automotive, Mobile Equipment, and Associated Parts and Components Coating Operations (Amended 8/25/11)	The provisions of this rule shall apply to any person who supplies, sells, offers for sale, manufactures, or distributes any automotive coating or associated solvent for use within the jurisdiction, as well as any person who uses, applies, or solicits the use or application of any automotive coating or associated solvent within the jurisdiction. The provisions of Rule 441, Organic Solvents, shall not apply to persons using automotive coatings and solvents subject to this rule	The rule contains various VOC content limits that apply to different types of automotive refinishing coatings based on use and purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds Rule provides an alternative compliance option allowing for the use of an approved emission control system, which achieves an overall control efficiency of at least 85%
CARB 2005 Suggested Control Measures for Automotive Refinishing Coatings	The provisions of the measure apply to facilities conducting automotive refinishing activities	Suggested control measure contains various suggested VOC content limits that apply to different types of automotive refinishing coatings based on use and

Rule	Applicability	Control Measure
		purpose The VOC content limits can be achieved using the following control technologies: waterborne formulation and utilization of exempt compounds

TABLE 4-37
VOC CONTENT LIMITS (G/L) – LESS WATER AND EXEMPT COMPOUNDS

Coating Category	South Coast AQMD Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations [^] (Amended 11/1/24)	SBCAPCD Rule 339 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/19/08)	SDAPCD Rule 67.20.1 - Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/30/10)	BAAQMD Rule 8-45 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 12/3/08)	SJVAPCD Rule 4612 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 10/21/10)	SMAQMD Rule 459 – Automotive, Mobile Equipment, and Associated Parts and Components Coating Operations (Amended 8/25/11)	CARB 2005 Suggested Control Measures for Automotive Refinishing Coatings
Base Coatings							
Color Coating	420 (250)	420	420	420	420	420	420
Tinted Mid-Coat	750 (250)						
Clear Coatings	N/A	250	250	250	250	250	250
Gloss Clear Coating	520 (250)	N/A	N/A	N/A	N/A	N/A	N/A
Matte Clear Coating	550	N/A	N/A	N/A	N/A	N/A	N/A
Multi-Color Coating	N/A	680	680	680	680	520 or 680*	680
Primers and Sealers							
Pretreatment Wash Primer	780 (660)	660	660	660	660	660	660
Epoxy Primer	580 (340)	N/A	N/A	N/A	N/A	N/A	N/A
Primer Sealer	550 (250)	250	250	250	250	250	N/A
Primer Surfacer	580 (250)	N/A	N/A	N/A	N/A	N/A	N/A
Other Coating Categories							
Adhesion Promoter	840 (720)	540	540	540	540	540	540
Single-Stage Coating	600 (340)	340	340	340	340	340	340

Coating Category	South Coast AQMD Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations [^] (Amended 11/1/24)	SBCAPCD Rule 339 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/19/08)	SDAPCD Rule 67.20.1 - Motor Vehicle and Mobile Equipment Coating Operations (Amended 6/30/10)	BAAQMD Rule 8-45 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 12/3/08)	SJVAPCD Rule 4612 – Motor Vehicle and Mobile Equipment Coating Operations (Amended 10/21/10)	SMAQMD Rule 459 – Automotive, Mobile Equipment, and Associated Parts and Components Coating Operations (Amended 8/25/11)	CARB 2005 Suggested Control Measures for Automotive Refinishing Coatings
Temporary Protective Coating	60	60	60	60	60	60	60
Truck Bed Liner Coating	310	310	310	310	310	310	310
Underbody Coating	430	430	430	430	430	430	430
Uniform Finishing Coating	540	540	540	540	540	540	540
Pigmented Coating for Military Tactical Support Vehicles and Equipment	N/A	N/A	420	N/A	N/A	N/A	N/A
Primer for Military Tactical Support Vehicles and Equipment	N/A	N/A	420	N/A	N/A	N/A	N/A
Any Other Coating Type	250	250	250	250	250	250	250

* Mobile equipment driven or drawn on rails and its associated parts and components (520 g/L); Any other mobile equipment or motor vehicle and its associated parts and components (680 g/L).

[^] Phase I VOC limits are shown with the Phase II limits in parentheses which have varying effective dates.

Staff compared the provisions of South Coast AQMD Rule 1151 with control measures implemented in other jurisdictions in the tables above. South Coast AQMD's Rule 1151 was recently amended on November 1, 2024 to phase out the use of pCBtF and t-BAc in automotive coatings and solvents due to their carcinogenic properties. A temporary Phase I period of three to five years, depending on coating category, was established to allow the sale and use of coatings formulated to meet U.S. EPA National Rule limits. These coatings do not contain pCBtF or t-BAc. Starting in Phase II, between 2028 and 2030, facilities will switch to newly reformulated, low-VOC coatings that do not contain pCBtF or t-BAc.

Rule 1151 partially implements the 2022 AQMP Control Measure CTS-01, which aims to reduce emissions from coatings, solvents, adhesives, and lubricants. Although Rule 1151 is anticipated to temporarily increase VOC emissions by 4.8 tpd, the public health benefits from removing pCBtF and t-BAc far outweigh any short-term emission increases. Upon full implementation, the Phase II limits will result in an overall decrease of 0.19 tpd of VOC emissions. The tiered approach balances immediate health concerns with the feasibility of industry adaptation, further reducing toxic emissions and improving air quality.

Compared to other air districts' rules, the few differences include the coating categories "Pigmented Coating for Military Tactical Support Vehicles and Equipment" and "Primer for Military Tactical Support Vehicles and Equipment" being included in SDAPCD's Rule 67-20-1, and some refined coating categories in Rule 1151 including the coating categories "Gloss Clear Coating," "Matte Clear Coating," "Epoxy Primer," and "Primer Surfacer" while other agencies' rules do not have applicable VOC limits for these categories. The coating category "Multi-Color Coating" was removed from Rule 1151 because it was not reported in the manufacturer's survey, and no coatings could be identified that meet its definition. Overall, the Phase II VOC limits in South Coast AQMD Rule 1151 are as stringent as, and some cases more stringent than, the limits in other districts' rules. In addition, Rule 1151 implements the 2022 AQMP Control Measure CTS-01 and the emission reductions were relied upon in the attainment demonstration. Therefore, no contingency measures are proposed.

ix. Marine and Pleasure Craft Coatings

South Coast AQMD Rule 1106 applies to this source category. Staff reviewed control measures for this source category implemented by other local air agencies, including SJVAPCD Rule 4603 and VCAPCD Rule 74.24.1. Table 4-38 summarizes the comparative analysis.

TABLE 4-38
SOUTH COAST AQMD RULE 1106 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1106 – Marine and Pleasure Craft Coatings (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	VCAPCD Rule 74.24.1 – Pleasure Craft Coating and Commercial Boatyard Operations (Amended 11/10/20)
Applicability	Any person who supplies, sells, offers for sale, markets, manufactures, blends,	The surface coating of metal parts or products, large appliances parts or products,	Any person who applies, specifies the use of, or supplies coatings for marine

Rule Element	South Coast AQMD Rule 1106 – Marine and Pleasure Craft Coatings (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	VCAPCD Rule 74.24.1 – Pleasure Craft Coating and Commercial Boatyard Operations (Amended 11/10/20)
	packages, repackages, possesses or distributes any Marine or Pleasure Craft Coating and any associated solvent for use within the SCAQMD, as well as any person who applies, stores at a worksite, or solicits the application of any Marine or Pleasure Craft Coating and any associated solvent within the SCAQMD	metal furniture, and plastic parts and products, automotive/transportation and business machine plastic parts and products, and pleasure crafts, and to the organic solvent cleaning, and the storage and disposal of all solvents and waste solvent materials	and fresh water vessels, drilling vessels, and navigational aids, and their parts or components, including any parts subjected to unprotected shipboard conditions
Exemptions	• Marine or pleasure craft coatings with VOC content ≤ 50 g/L (less water and exempt compounds) as applied • Marine coatings applied to interior surfaces of potable water containers • Touch-up coatings • Any aerosol coating products • Application equipment transfer efficiency requirements for coatings with viscosity of 650 centipoise or greater, as applied • Coating limit requirements for marine coatings for vessels that are intended to submerge to at least 500 feet below the surface water level with a total usage of ≤ 12 gal/year	• The requirements of this rule shall not apply to the application of coatings to aircraft, aerospace vehicles, marine vessels, can, coils, and magnetic wire • For pleasure craft coating operations, the application method requirements shall not apply to extreme gloss coating provided the operator complies with the extreme gloss coating VOC limit and the work practice standards in this rule. • Stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment • An operator of pleasure craft coating operations whose VOC emissions from coating operations,	• Aerosol coating products subject to California Code of Regulations, Title 17, Article 3, Aerosol Coating Products • Coating application transfer efficiency requirements for application of any topcoat above the vessel water line • Prohibition sales requirements to any supplier or seller of any pleasure craft coating that is shipped outside of the District for use outside the District • Prohibition sales requirements to any manufacturer of any pleasure craft coatings if the manufacturer has provided an accurate compliance statement and if: 1) The pleasure craft coating was not sold

Rule Element	South Coast AQMD Rule 1106 – Marine and Pleasure Craft Coatings (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	VCAPCD Rule 74.24.1 – Pleasure Craft Coating and Commercial Boatyard Operations (Amended 11/10/20)
		including related cleaning activities <2.7 tons VOC per 12-month rolling period are not subject to the VOC limits of this rule provided records are maintained	directly to a user or a sales outlet located in the District; or 2) The pleasure craft coating was sold to an independent distributor that is not a subsidiary of, or under the direct control of the manufacturer • Surface preparation requirements to the surface preparation of fiberglass substrates
Application Equipment Requirements	Only apply coatings using the following methods: • Electrostatic application; • HVLP spray; • Brush, Dip, Roller; or • Spray application equivalent to HVLP spray; or • Other application method with demonstrated transfer efficiency $\geq$ HVLP spray with prior APCO written approval	Only apply coatings using the following methods: • Electrostatic application; • Electrodeposition; • HVLP spray; • Flow, Roll, Dip, Brush, Continuous coating; or • Other application method with demonstrated transfer efficiency $\geq 65\%$ with prior APCO written approval	Only apply coatings using one of following methods properly: • Hand application methods; • HVLP spray; or • Any other application method which has been demonstrated to be capable of achieving a transfer efficiency of at least that of an HVLP application or an alternative method that is capable of achieving a transfer efficiency equal to or better than HVLP spray
Solvent Cleaning VOC Content Limits	25 grams/liter 0.21 pounds/gallon (material VOC content)	25 grams/liter 0.21 pounds/gallon (material VOC content)	• 200 grams/liter (1.7 pounds/gallon) ROC for surface preparation • No person shall use methylene chloride as a cleanup solvent
Solvent Storage and Disposal Requirements	All VOC-containing solvents used in solvent cleaning operations shall be stored in non-absorbent, non-leaking containers, which shall remain	Store or dispose of fresh or spent solvents, waste solvent cleaning materials, coatings, adhesives, catalysts, and thinners in closed, non-	All ROC containing materials shall be stored in nonabsorbent, non-leaking containers, which shall be

Rule Element	South Coast AQMD Rule 1106 – Marine and Pleasure Craft Coatings (Amended 1/6/23)	SJVAPCD Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (Amended 9/17/09)	VCAPCD Rule 74.24.1 – Pleasure Craft Coating and Commercial Boatyard Operations (Amended 11/10/20)	
	closed at all times except when filling or emptying. It is recommended that cloth or paper moistened with VOC-containing solvents be stored in closed, non-absorbent, non-leaking containers	absorbent and non-leaking containers. Containers shall remain closed except when depositing or removing the contents of the containers	closed except when adding or removing materials	
VOC Content Limits for Pleasure Craft Coating Operations in grams/liter Less Water and Exempt Organic Compounds	Coating Type	Rule 1106	SJVAPCD Rule 4603	VCAPCD Rule 74.24.1
	Extreme High Gloss Topcoat	490	490	490
	High Gloss Topcoat	420	420	420
	Pretreatment Wash Primer	780	780	780
	Finish Primer Surfacer	420	420	420
	High Build Primer Surfacer	340	340	340
	Aluminum Substrate Antifoulant Coating	560	560	560
	Other Substrate Antifoulant Coating	330	330	Commercial – 400 Pleasure Craft – 330
	All other pleasure craft surface coatings for metal or plastic	420	420	420
	Sealers	550	---	550
	Varnishes	490	---	490
	Teak Primer	775	---	---
	Low-Solids	120	---	120

Rule 1106 contains unique exemptions that do not align with those in other districts' rules. For example, coatings with a VOC content of 50 g/L or less, coatings with high viscosity, and submarine coatings are exempt from certain Rule 1106 requirements. The first exemption was introduced to incentivize users to choose lower VOC coatings and manufacturers to formulate lower VOC products. Meanwhile, highly viscous coatings are not amenable to application using spray equipment due to poor flow characteristics. Without the exemption, shops using HVLP equipment would have to thin high solids coatings with VOC solvents to allow them to be sprayed, thus eliminating the benefit of the low-VOC high solids coatings. Finally, the submarine exemption was introduced because the Department of Defense requires the use of coatings that comply with military specifications. While these coatings exceed the VOC content limits in

Rule 1106, their usage is limited to no more than 12 gallons per calendar year of all products combined. The exemptions are reasonable and do not make Rule 1106 less stringent than other district's rules.

South Coast AQMD Rule 1106 contains VOC content limits that are as stringent as those in other districts' rules and staff did not identify any other provisions that would be suitable for a contingency measure.

x. Metal Container, Closure, and Coil Coating Operations

South Coast AQMD Rule 1125 applies to this source category. Staff reviewed control measures for this source category implemented by South Coast AQMD and other local air agencies, including SJVAPCD Rule 4604, SMAQMD Rule 452, and BAAQMD Rule 8-11. Table 4-39 summarizes the control measures staff considered for this source category comparative analysis.

South Coast AQMD Rule 1125 varies in stringency relative to other districts' rules. Other districts' rules have a lower limit for three-piece can interior body sprays (360 g/L vs. 510 g/L) and two-piece can interior body sprays (420 g/L vs. 440 g/L). In addition, while South Coast AQMD and SJVAPCD exempt facilities using small quantities of certain coatings, BAAQMD and SMAQMD do not allow any exemptions. Finally, the minimum required air pollution control device efficiency is slightly less than that required by other districts' rules (85.5 percent vs. 90 percent). However, at the time of rule amendment in 2008, all facilities using add-on control technology to achieve compliance were operating at overall efficiencies at or above 90 percent.⁴⁹

Meanwhile, Rule 1125 is potentially more stringent compared to other districts' rules due to the inclusion of VOC content limits for necker lubricants and inkjet inks, which are not covered by other districts' rules. In addition, the VOC content limits in Rule 1125 for end sealing compounds are more stringent than those in SJVAPCD Rule 4604.

The 2016 and 2022 AQMPs included Potential Control Measures 14 and RACM 7, respectively, to assess the feasibility of adopting more stringent VOC content limits similar to those in other districts' rules. Both AQMPs concluded that implementing these stricter limits would not be cost-effective, as costs exceeded \$200,000 per ton of VOC reduced for the four facilities currently subject to Rule 1125. Additionally, the anticipated emission reductions—about 0.13 tons per year—would have an inconsequential impact on air quality. In the future, however, Rule 1125 is expected to undergo an amendment process to prohibit the use of pCBtF and t-BAc in applicable coatings. As part of the rulemaking, staff will undertake a comprehensive BARCT analysis to consider more stringent VOC content limits. The phase out of pCBtF and t-Bac and lowering VOC limits will be implemented as soon as feasible following the adoption of the rule, therefore, no contingency measures are proposed for this category.

⁴⁹ South Coast AQMD, Final Staff Report for Proposed Amended Rule 1125, p. 11.
<http://www3.aqmd.gov/hb/2008/March/080336a.html>

TABLE 4-39
SOUTH COAST AQMD RULE 1125 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	SJVAPCD Rule 4604 – Can and Coil Coating Operations (Amended 9/20/07)	SMAQMD Rule 452 – Can Coating (Amended 9/25/08)	BAAQMD Rule 8-11 – Metal Container, Closure and Coil Coating (Amended 11/19/97)
Applicability	Applies to all coating operations in the manufacturing and/or reconditioning of metal cans, drums, pails, lids, and closures. It also includes coating of the surface of flat metal sheets, strips, rolls, or coils during the manufacturing and/or reconditioning of metal containers, closures, and coils	Applies to can and coil coating operations, and from organic solvent cleaning, storage and disposal associated with can coating and coil coating operations	The provisions of this rule shall apply to can coating operations	Applies to the coating of metal coils, cans, drums, pails, lids and crowns
Requirements	- Facilities may either comply with the VOC content limits or employ an emission control system with a 90% collection efficiency and a 95% destruction efficiency - All solvent cleaning operations must conform to the requirements of Rule 1171	Facilities have the option to either meet the VOC content limits directly or use an emission control system that achieves at least 90% control efficiency, or alternatively, reduces VOC emissions by an amount equal to what would be attained by adhering to the limits	Facilities have the option to either meet the VOC content limits directly or use an emission control system that achieves at least 90% control efficiency and does not emit emissions greater than those that would be achieved from the use of compliant coatings	Facilities have the option to either meet the VOC content limits directly or use air pollution abatement equipment with an abatement device efficiency of at least 90%

Rule Element	South Coast AQMD Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	SJVAPCD Rule 4604 – Can and Coil Coating Operations (Amended 9/20/07)	SMAQMD Rule 452 – Can Coating (Amended 9/25/08)	BAAQMD Rule 8-11 – Metal Container, Closure and Coil Coating (Amended 11/19/97)
Coating Application	Coating must be applied with properly operating equipment using one of the following methods: • Electrostatic • Flow coat • Roll coat • Dip coat • HVLP spray • Hand application • Printing • Other methods demonstrated to achieve an equivalent transfer efficiency	Coating must be applied with properly operating equipment using one of the following methods: • Electrostatic • Flow coat • Roll coat • Dip coat • HVLP spray • Hand application • Other methods demonstrated to achieve a $\geq 65\%$ transfer efficiency • Employing an emission control system that achieves a capture and control efficiency of $\geq 90\%$	Coating must be applied with properly operating equipment using one of the following methods: • Electrostatic • Flow coat • Roll coat • Dip coat • HVLP spray • LVLP spray • Hand application • Other methods demonstrated to achieve an equivalent transfer efficiency • Employing an emission control system that achieves a capture and control efficiency of $\geq 85.5\%$	No requirements
Exemptions	• Spray coating of 1 gallon per day or less per facility • Aerosol coating products	• Facilities using 55 gallons or less of aggregate coatings and cleaning solvents per rolling 12-month period.	None	None

Rule Element	South Coast AQMD Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	SJVAPCD Rule 4604 – Can and Coil Coating Operations (Amended 9/20/07)	SMAQMD Rule 452 – Can Coating (Amended 9/25/08)	BAAQMD Rule 8-11 – Metal Container, Closure and Coil Coating (Amended 11/19/97)	
		- Lubricants applied by spray mister to the can end seal compound application nozzle and the lubricants applied to the can body during the can body forming process. - Stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment. - Cleaning solvent VOC limits shall not apply to the cleaning in laboratory tests and analyses			
VOC Content Limits for Can Coatings in grams/liter Less Water and Exempt Organic Compounds	Coating Type	Rule 1125	SJVAPCD Rule 4604	SMAQMD Rule 452	BAAQMD Rule 8-11
	Three-Piece Can Sheet Basecoat (Exterior and Interior Overvarnish)	225	225	225	225
	Two-Piece Can Exterior Basecoat and Overvarnish	250	250	250	250

Rule Element	South Coast AQMD Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	SJVAPCD Rule 4604 – Can and Coil Coating Operations (Amended 9/20/07)	SMAQMD Rule 452 – Can Coating (Amended 9/25/08)	BAAQMD Rule 8-11 – Metal Container, Closure and Coil Coating (Amended 11/19/97)	
	Can Interior Body Spray (Two-Piece)	440	420	420	
	Can Interior Body Spray (Three-Piece)	510	360	360	
	Three-Piece Can Side Seam Spray	660	660	660	
VOC Content Limits for Drums, Pails, and Lids Coatings in grams/liter Less Water and Exempt Organic Compounds	Coating Type	Rule 1125	SJVAPCD Rule 4604	SMAQMD Rule 452	BAAQMD Rule 8-11
	New (Exterior)	340	340	---	340
	New (Interior)	420	420	---	420
	Reconditioned (Exterior)	420	420	---	420
	Reconditioned (Interior)	510	510	---	510
VOC Content Limits for Coil Coatings in grams/liter Less Water and Exempt Organic Compounds	Coating Type	Rule 1125	SJVAPCD Rule 4604	SMAQMD Rule 452	BAAQMD Rule 8-11
	All Coatings	200	200	---	200
VOC Content Limits for All Operations in grams/liter Less Water and Exempt	Coating Type	Rule 1125	SJVAPCD Rule 4604	SMAQMD Rule 452	BAAQMD Rule 8-11
	Necker Lubricants	100	---	---	---
	End Sealing Compounds - Food/Beverage Cans	20	60	20	20

Rule Element	South Coast AQMD Rule 1125 – Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	SJVAPCD Rule 4604 – Can and Coil Coating Operations (Amended 9/20/07)	SMAQMD Rule 452 – Can Coating (Amended 9/25/08)	BAAQMD Rule 8-11 – Metal Container, Closure and Coil Coating (Amended 11/19/97)	
Organic Compounds	End Sealing Compounds - Non- Food Containers	0	60	0	20
	Inks - Other than Inkjet	300	---	---	300
	Inks – Inkjet*	250	---	---	---
	Inks - Thermochromic Inkjet*	700	---	---	---
	Inkjet Make-Up Solvents – General*	250	---	---	---
	Inkjet Make-Up Solvents – Thermochromic*	800	---	---	---

*Referenced VOC limits expressed as grams of VOC per liter of material.

xi. Magnet Wire Coatings

South Coast AQMD Rule 1126 applies to this source category. Staff reviewed control measures for this source category implemented under BAAQMD Rule 8-26.

Table 4-40 summarizes the control measures staff considered for this source category comparative analysis. South Coast AQMD Rule 1126 has the most stringent requirements and, therefore, no contingency measures are proposed.

TABLE 4-40
SOUTH COAST AQMD RULE 1126 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1126 – Magnet Wire Coating Operations (Amended 1/13/95)	BAAQMD Rule 8-26 – Magnet Wire Coating Operations (Amended 12/20/95)
Applicability	Applies to all coating operations on magnet wire, where the wire is continuously drawn through a coating applicator	Applies to all coating operations on magnet wire
Requirements	Comply with the specified VOC emission limit or by installing an approved emission control device with a control efficiency of at least 90%	Comply with the specified VOC emission limit or by installing an approved emission control device with a control efficiency of at least 90%
Emission Limit for magnet wire coatings in grams/liter, less water and exempt compounds	200	200
Exemptions	- Operations which emit less than 1 kg per hour, and not more than 5 kg per day of VOC - Aerosol coating products	- Operations which emit less than 1 kg per hour, and not more than 6.8 kg per day of VOC - Coating of electrical machinery and equipment subassemblies

xii. High-Emitting Spray Booths

South Coast AQMD Rule 1132 applies to high-emitting spray booth facilities comprised of aerospace, metal, plastic and wood products coatings, and open molding composite manufacturing operations. Facilities subject to Rule 1132 are also subject to other source-specific South Coast AQMD rules, including Rules 1107, 1115, 1124, 1128, 1136, 1145, 1162, and 1171. Rule 1162 is evaluated under Industrial Processes while the other rules are evaluated separately under their respective coating categories.

Rule 1132 requirements were previously summarized in Table 4-22 at the beginning of the Cleaning and Surface Coatings evaluation section and staff did not identify comparable rules in other air districts. Therefore, Rule 1132 is not further evaluated.

c. Conclusion

Staff reviewed the available control measures for the major source category 230 – Coatings and Related Process Solvents category and found that the available measures are already being implemented. Furthermore, South Coast AQMD rules are just as stringent as other large regulatory bodies. In addition, as coating manufacturers would require a minimum of a few years to reformulate coatings, there are no feasible short-term contingency measures that can be taken regarding the VOC content limits in applicable rules. Consequently, no contingency measures are proposed.

4. Printing

a. Overview

Major source category 240 – Printing includes thinning and cleanup solvents, rotogravure, flexographic, lithographic, letter press, screen printing, and other printing related sources. As summarized in Table 4-41, this source category accounts for 0.89 tpd of VOC and zero NOx emissions in 2037.

**TABLE 4-41
PRINTING EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Source Category	VOC (tpd)	NOx (tpd)
240 – Thinning and Cleanup Solvent Uses	0.20	0.00
260 – Rotogravure	0.00	0.00
262 – Flexographic	0.04	0.00
264 – Lithographic	0.49	0.00
266 – Letter Press	0.00	0.00
268 – Screen Printing	0.02	0.00
995 – Other	0.15	0.00
Total	0.89	0.00

b. Evaluation

South Coast AQMD Rules 442, 1128, 1130, and 1130.1 apply to this source category. Because Rule 442 was discussed in Table 4-25 for the degreasing source category, it is excluded in this section, and the remaining rules are compared with the applicable rules in other air districts.

Staff compared South Coast AQMD rules and other air districts' rules in Table 4-42. The review of the different control measures indicated that South Coast AQMD's requirements are similar to other air districts. One of those requirements is the utilization of an emission control device with a control efficiency of at least 90 percent. Furthermore, the implementation of similar best management practices and good housekeeping to minimize emissions is required, e.g., prohibiting the use of spray coating unless a high transfer efficiency method is used. In addition, South Coast AQMD sets a VOC content limit for coatings of 265 g/L, which aligns with that in other air districts, as well as an overall emission control efficiency of 90 percent. This VOC limit is more stringent than the limit recommended by U.S. EPA's CTG. Staff did not

identify control measures for further consideration as contingency measures in the South Coast AQMD jurisdiction.

c. Conclusion

South Coast AQMD rules for printing generally contain the most stringent requirements compared to similar rules from other districts. In addition, reformulating to lower VOC-content materials would take more than two years. Therefore, staff did not identify any potential contingency measures for printing.

TABLE 4-42
COMPARISON OF SOUTH COAST AQMD RULES AND OTHER AIR DISTRICTS' RULES FOR PRINTING

TABLE 4-42.1 – Paper, Fabric, and Film Coating Operations						
Rule Element	South Coast AQMD Rule 1128 – Paper, Fabric, and Film Coating Operations (Amended 3/8/96)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	BAAQMD Rule 8-12 – Paper, Fabric and Film Coating (Amended 12/20/95)	U.S. EPA – CTG for Paper, Film, and Foil Coatings (Amended 9/2009)	SDAPCD Rule 67.5 – Paper, Film and Fabric Coating Operations (Amended 5/15/96)	VCAPCD Rule 74.3 – Paper, Fabric and Film Coating Operation (Amended 12/10/91)
Applicability	Coatings or wash primers to paper, fabric, or film substrates	Graphic arts printing operations, digital printing operations, and paper, film, foil or fabric coating operations	Application of coatings and adhesives to paper, fabric or films	This CTG provides control recommendations for reducing VOC emissions stemming from the use of coatings in paper, film, and foil surface coating operations	Applies to any paper, fabric, and/or film coating application process	Coating of paper, fabric or film
Key Exemptions	Coating facility that applies <2 gal/day Application of materials with <20 g/L	None applicable	Coating line that emits <14.3 lb/day			

Rule Element	South Coast AQMD Rule 1128 – Paper, Fabric, and Film Coating Operations (Amended 3/8/96)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	BAAQMD Rule 8-12 – Paper, Fabric and Film Coating (Amended 12/20/95)	U.S. EPA – CTG for Paper, Film, and Foil Coatings (Amended 9/2009)	SDAPCD Rule 67.5 – Paper, Film and Fabric Coating Operations (Amended 05/15/96)	VCAPCD Rule 74.3 – Paper, Fabric and Film Coating Operation (Amended 12/10/91)
Key Requirements	Coating VOC content: <265 g/L of coating, with or without heating ovens and a minimum transfer efficiency of 95%; or - VOC emissions are reduced to <120 g/L of coating applied Plastisol VOC content: <20 g/L of coating Wash primer VOC content: <265 g/L of material used; or - VOC emissions are collected and reduced by an approved emission control system Cleaning of application equipment:	Coating VOC content: <265 g/L of coating Plastisol VOC content: <20 g/L of coating Wash primer VOC content: <265 g/L of material used Emission control system: 90%, overall capture and control efficiency	Coating or adhesive VOC content: <265 g/L of coating - VOC emissions are reduced to <120 g/L of coating applied	- Recommends a limit of 350 g/L - VOC control efficiency of 90% overall control	- Coating-specific VOC content limits of 265 g/L, or - Use control system with a combined collection efficiency of 90% - Coating must display the content of methyl chloride	Coating VOC content: <265 g/L of coating VOC emissions from application process are <120 g/L of coating applied Combined capture and destruction efficiency of no less than 90% Clean-up solvent VOC content: <200 g/L All VOC-containing solvents must be stored in non-absorbent, non-leaking containers

Rule Element	South Coast AQMD Rule 1128 – Paper, Fabric, and Film Coating Operations (Amended 3/8/96)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	BAAQMD Rule 8-12 – Paper, Fabric and Film Coating (Amended 12/20/95)	U.S. EPA – CTG for Paper, Film, and Foil Coatings (Amended 9/2009)	SDAPCD Rule 67.5 – Paper, Film and Fabric Coating Operations (Amended 05/15/96)	VCAPCD Rule 74.3 – Paper, Fabric and Film Coating Operation (Amended 12/10/91)
	85% of VOC are collected and disposed; or - Clean-up materials contain $\leq 15\%$ VOC Approved emission control system: 90% emission collection and 95% emission reduction (85%, overall efficiency); or 50 ppm outlet concentration All VOC-containing solvents must be stored in non-absorbent, non-leaking containers					

TABLE 4-42.2 – Graphic Arts Operations					
Rule Element	South Coast AQMD Rule 1130 – Graphic Arts (Amended 5/2/14)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	SMAQMD Rule 450 – Graphic Arts Operations (Amended 10/23/08)	BAAQMD Rule 8-20 – Graphic Arts Printing and Coating Operations (Amended 11/19/08)	VCAPCD Rule 74.19 – Graphic Arts (Amended 6/14/11)
Applicability	Any person performing graphic arts operations or who supplies, sells, offers for sale, markets, manufactures, blends, repackages, stores at a worksite, distributes, applies or solicits the application of graphic arts materials for use	Graphic arts printing operations, digital printing operations, and paper, film, foil or fabric coating operations	Graphic arts operations and any screen printing operation at any stationary source regardless of the substrate	Graphic arts operation	Any person who applies, manufactures, or supplies any ink, coating, adhesive, fountain solution, or solvent containing VOC that is as part of a graphic arts operation or sold for use in a graphic arts operation

Rule Element	South Coast AQMD Rule 1130 – Graphic Arts (Amended 5/2/14)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	SMAQMD Rule 450 – Graphic Arts Operations (Amended 10/23/08)	BAAQMD Rule 8-20 – Graphic Arts Printing and Coating Operations (Amended 11/19/08)	VCAPCD Rule 74.19 – Graphic Arts (Amended 6/14/11)
Exemptions	Metallic and matte finish inks: • Usage not to exceed 2 gallons on any one day and 125 gal/year at a facility • Potential to emit (PTE) and actual VOC emissions do not exceed 10 tons per calendar year from all VOC sources; and • VOC content of matte finish does not exceed 535 g/L • VOC content of metallic inks does not exceed 460 g/L		Any graphic arts operation: • Actual emissions <60 lb/month from all graphic arts operations and cleaning materials; or • PTE ≤175 lb/month Aerosol adhesives: • <600 lb/month Lithographic and letterpress printing, metering rollers and printing plates: • ≤100 g/L Fountain solution: • Total actual emissions of <450 lb/month from all offset lithographic printing operations Heatset web offset lithographic printing and heatset web letterpress printing: • PTE from drying oven, prior to emissions	Low-emitting exemption: • <75 lb/month	Any stationary source that emits <200 lb VOC/rolling 12 month

Rule Element	South Coast AQMD Rule 1130 – Graphic Arts (Amended 5/2/14)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	SMAQMD Rule 450 – Graphic Arts Operations (Amended 10/23/08)	BAAQMD Rule 8-20 – Graphic Arts Printing and Coating Operations (Amended 11/19/08)	VCAPCD Rule 74.19 – Graphic Arts (Amended 6/14/11)	
			control equipment, <25 tpy Flexible package printing inks, coatings, and adhesives: PTE from drying oven, prior to emissions control equipment, <25 tpy			
Requirements	VOC Content Limits, g/L					
	Category	South Coast AQMD Rule 1130	SJVAPCD Rule 4607	SMAQMD Rule 450	BAAQMD Rule 8-20	VCAPCD Rule 74.19
	Graphic art material					
	Adhesive	150	150	150	150	150
	Coating	300	300	300	300	300
	Flexographic fluorescent ink	300	300	300	300	300
	Flexographic, non-porous substrate	300	300	-	300	-
	Flexographic, porous substrate	225	225	-	225	225
	Gravure ink	225	-	-	-	-
	Letterpress ink	300	-	-	-	-
	Offset lithographic ink	300	-	-	-	-
	Fountain solution	-	-	-	8% by volume	-
	Heatset web-fed		1.6% by volume	-	-	-
	Using alcohol without refrigerated chiller	16	-	1.6% by weight	-	16
	Using alcohol with refrigerated chiller	30	-	3% by weight	-	30
	Using alcohol substitute	50	-	-	-	50
	Sheet-fed		5.0% by volume	-	-	-

Requirements	VOC Content Limits, g/L					
	Category	South Coast AQMD Rule 1130	SJVAPCD Rule 4607	SMAQMD Rule 450	BAAQMD Rule 8-20	VCAPCD Rule 74.19
	Using alcohol with refrigerated chiller	85	-	8.5% by weight	-	85
	Using alcohol substitute	50	-	5% by weight	-	50
	Not-heatset web-fed	-	5.0% by volume	-	-	50
	Using alcohol without refrigerated chiller	50	-	-	-	-
	Using alcohol with refrigerated chiller	50	-	-	-	-

TABLE 4-42.3 – Screen Printing Operations						
Rule Element	South Coast AQMD Rule 1130.1 – Screen Printing Operation (Amended 12/13/96)	SJVAPCD Rule 4607 – Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)	SMAQMD Rule 450 – Graphic Arts Operations (Amended 10/23/08)	BAAQMD Rule 8-20 – Graphic Arts Printing and Coating Operations (Amended 11/19/08)	VCAPCD Rule 74.19.1 – Screen Printing Operations (Amended 11/11/03)	
Applicability	Persons performing screen printing operations or who sell, distribute, or require the use of screen printing materials	See Table 4-42.2	See Table 4-42.2	See Table 4-42.2	Any person who uses or manufactures, specifies the use of, sells, or offers for sale, any ink, coating, adhesive, resist, or solvent containing VOC	
Exemptions	A facility or screen printing operations performed by manufacturers for performance research and development (R&D) that emit ≤2 lb VOC/day	See Table 4-42.2	See Table 4-42.2	See Table 4-42.2	Any facility that emits <200 lb VOC/rolling period of 12 months	
Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1130.1	SJVAPCD Rule 4607	SMAQMD Rule 450	BAAQMD Rule 8-20	VCAPCD Rule 74.19.1
	Product					
	Chlorine indicator	500	-	-	-	-
	Containers	800	-	-	-	-

Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1130.1	SJVAPCD Rule 4607	SMAQMD Rule 450	BAAQMD Rule 8-20	VCAPCD Rule 74.19.1
	Electronic circuit	850	-	-	-	-
	Mechanically-formed products	800	-	800	-	-
	Overlays	800	-	800	-	-
	Polyethylene products	800	-	-	-	-
	Sterilization indicator	600	-	-	-	-
	Water slide decals:	-	-	800	-	800
	Opaque inks	800	-	-	-	-
	Clear inks	800	-	-	-	-
	Ceramic decal inks	800	-	-	-	800
	Substrate					
	Ceramic	800	-	-	-	-
	Fiberglass	600	-	-	-	-
	Glass or metal	600	-	-	-	-
	Man-made textile	800	-	-	-	-
	Unsealed aluminum	800	-	-	-	-
	Screen Printing Material					
	Adhesive	400	150	150	150	400
	Coating	400	400	400	400	400
	Fine detail loose-leaf binder ink	745	-	-	-	-
	Fluorescent ink	540	-	-	-	-
	High-VOC serigraph ink	800	-	-	-	-
	Loose-leaf binder metallic ink	745	-	-	-	-
	Metallic ink	400	-	400	400	400
	Printing ink	400	-	-	-	400
	Resists	600	600	-	-	600
	Scratch-off ink	800	-	-	-	-
	Water-slide decal adhesive	800	-	-	-	-
	Extreme performance screen printing material	400	-	800	400	800

5. *Adhesives and Sealants*

a. Overview

Major source category 250 – Adhesives and Sealants includes emissions of VOC-containing organic solvent-based or water-based adhesives and sealant materials. This major source category accounts for 4.62 tpd of VOC and zero NOx emissions in the Basin’s 2037 summer planning inventory.

b. Evaluation

South Coast AQMD Rules 442 and 1168 apply to the major source category 250 – Adhesives and Sealants. Key requirements of Rule 442 were already discussed in Table 4-25 for the degreasing source category, along with the comparable requirements in other air districts’ rules. Therefore, this section only includes analysis of Rule 1168 and applicable air districts’ rules. Rule 1168 was amended in November 2022 to relax the stringency of certain limits due to a technology assessment which demonstrated that previous limits were not feasible.⁵⁰ In addition, the amendment prohibited the use of pCBtF and t-BAC, resulting in some VOC limits being increased to accommodate substitution with less toxic material.

South Coast AQMD Rule 1168 is compared with SJVAPCD Rule 4653, SMAQMD Rule 460, BAAQMD Rule 8-51, and VCAPCD Rule 74.20 in Table 4-43. Comparison of these rules revealed that the VOC limits in South Coast AQMD Rule 1168 are more stringent for most unit categories than those in other air districts. While there are some categories where other air districts’ rules are more stringent, Rule 1168 sets the most stringent limit that is technically feasible and restricts exemptions carefully. For example, SJVAPCD Rule 4653 has a significantly more stringent limit for pressure sensitive adhesive primers (250 g/L vs. 785 g/L). However, at the time of rule amendment, staff did not identify any pressure sensitive adhesive primers compliant with the 250 g/L limit and concluded that the limit is technologically infeasible.

SJVAPCD Rule 4653’s low usage and small container exemptions (20 gal/year adhesives and sealants; and adhesives that are sold or supplied in less than or equal to 8 oz. non-reusable containers) differ from those in South Coast AQMD Rule 1168 (55 gal/year, with some exceptions; and regulated products, which weigh less than or equal to 1 lb, or consist of less than or equal to 16 fluid oz.). For products which weigh less than or equal to 1 lb or consist of less than or equal to 16 fluid oz., they are exempted because they are regulated by CARB’s Consumer Products Regulation⁵¹ and are not subject to Rule 1168. In addition, the low usage exemption in SJVAPCD Rule 4653 applies generally to facilities that use less than 20 gal/year of any type of adhesive or sealant, meaning such facilities do not have to comply with any VOC limits. In contrast, South Coast AQMD allows facilities to use up to 55 gal/year of noncompliant products, but restricts this exemption where there are no compliant products and the facilities solely rely on this

⁵⁰ South Coast AQMD, Final Subsequent Environmental Assessment for Proposed Amended Rule 1168 - Adhesive and Sealant Applications, October 2022. <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2022/2022-Nov4-027.pdf?sfvrsn=6>

⁵¹ CCR Title 17 § 94509

exemption (e.g., pressure sensitive and rubber vulcanization products). The low usage exemption also excludes:

- Architectural applications;
- Contact adhesives;
- Special purpose contact adhesives;
- Adhesives used on porous substrates;
- Rubber vulcanization adhesives; and
- Top and trim adhesives.

South Coast AQMD also has the following exemptions, which do not correspond to any equivalent exemptions in SJVAPCD Rule 4653:

1. Regulated products used in the field installation and repair of potable water linings and covers at water treatment, storage, or water distribution facilities.
2. Adhesive tape.
3. Regulated products sold in quantities of less than or equal to 1 fluid oz.
4. Adhesives used to glue flowers to parade floats.
5. Shoe repair, luggage, and handbag adhesives.

While these exemptions may appear to be less stringent than other districts' rules, further analysis revealed this not to be the case. The potable water linings and covers exemption was needed to support a more stringent VOC limit for potable water architectural sealants (100 g/L in Rule 1168 vs. 250 g/L in other districts' rules), as these were the instances where the lower limit could not be achieved. Adhesive tapes were exempted because these products do not have a measurable VOC content and products sold in quantities of less than or equal to 1 fluid oz. are exempted to align with CARB's Consumer Products Regulation.⁵² The "adhesives used to glue flowers to parade floats" are exempted to support the New Year's Rose Parade. No other district has this type of parade and therefore no exemption was granted. Shoe repair, luggage, and handbag adhesives use contact adhesives in quantities less than 20 gallons per year. Other air districts exempt all adhesive use below 20 gallons per year per facility. Since contact adhesives are not included in the 55 gallon exemption for Rule 1168, an exemption for that specific use is included in the rule. Ultimately, these operations are exempted either directly (as in Rule 1168) or the more broadly applicable 20 gallon per year per facility exemption in other air district regulations. Table 4-31 compares South Coast AQMD's Rule 1168 with other districts' rules and demonstrates that South Coast AQMD has more stringent limits in multiple adhesive categories.

c. Conclusion

Staff concluded that there is no appropriate contingency measure for the adhesives and sealants source category. VOC limits in certain categories were identified as technologically infeasible during recent rule amendments. Besides the technological feasibility, it is not feasible to trigger lower VOC limits for adhesives and sealants due to the required implementation timeline of a contingency measure. Consistent

⁵² CCR Title 17 § 94509

with the U.S. EPA's guidance, South Coast AQMD would only have 60 days from the triggering date to issue a compliance advisory to adhesive and sealant manufacturers and distribute lower VOC products within two years. Reformulation to lower VOC content products requires significantly longer lead times than two years. Given the urgency and severity of ozone air quality in the Basin, if such opportunities to reduce VOC emissions existed, they would be adopted as control measures to attain ozone standards and improve air quality, rather than being reserved for contingency.

In some instances, commercially available products already have lower VOC content than is required by regulation and VOC emissions from these products are already reflected in the SIP inventory, which is based on reported sales data. Therefore, there would be no emission reductions associated with these products. In all, staff does not consider lower VOC limits for adhesives and sealants to be a feasible contingency measure.

TABLE 4-43
COMPARISON OF SOUTH COAST AQMD RULE 1168 AND OTHER AIR DISTRICTS' RULES FOR ADHESIVES AND SEALANTS

Rule Element	South Coast AQMD Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	SJVAPCD Rule 4653 – Adhesives and Sealants (Amended 9/16/10)	SMAQMD Rule 460 – Adhesives and Sealants (Amended 11/30/00)	BAAQMD Rule 8-51 – Adhesive and Sealant Products (Amended 7/17/02)	VCAPCD Rule 74.20 – Adhesives and Sealants (Amended 10/9/18)
Applicability	Any person who uses, sells, stores, supplies, distributes, offers for sale, or manufactures for sale any adhesives, adhesive primers, sealants, or sealant primers, unless otherwise specifically exempted by this rule	Any person who supplies, sells, offers for sale, or applies any adhesive product, sealant product, or associated solvent	Any person who manufactures, sells, offers for sale, or supplies an adhesive or sealant product for use in the district, or uses an adhesive or sealant product, or uses a surface preparation solvent, a cleanup solvent, or a stripper, or solicits, requires the use of, or specifies the application of an adhesive or sealant product, surface preparation solvent, cleanup solvent, or stripper that does not comply with this rule		Any person who supplies, sells, offers for sale, manufactures, solicits the application of, or uses adhesives, sealants, sealant primers or adhesive primers in Ventura County
Exemptions	- Adhesive tape - Adhesives, adhesive primers, sealants, or sealant primers, and associated application processes - Regulated products shipped, supplied, or sold to persons for use outside the District, or distribution centers that do not ship regulated products	- Stationary sources that use ≤20 gallons (gal.) of adhesive products - Adhesive/sealant products containing less than 20 g VOC/L. - Testing and evaluation of adhesives in research laboratories, analytical laboratories, or quality assurance laboratories	- Household adhesives regulated by the State of California - Solvent welding operations used in the manufacturing medical devices including catheters, heart valves, blood cardioplegia machines, tracheotomy tubes, blood oxygenators, and cardiatory reservoirs	- Aerosol adhesive products - Adhesive or sealant products in the manufacture or repair of aerospace or undersea-based weapons system components - consumer adhesives subject to the CARB consumer products regulation, 17 CCR	- Any stationary source that emits less than 200 pounds (lb.) of VOC in every rolling period of 12 consecutive calendar months from adhesive and sealant operations - Assembling, manufacturing and repairing of aerospace components - Graphic arts operations

Rule Element	South Coast AQMD Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	SJVAPCD Rule 4653 – Adhesives and Sealants (Amended 9/16/10)	SMAQMD Rule 460 – Adhesives and Sealants (Amended 11/30/00)	BAAQMD Rule 8-51 – Adhesive and Sealant Products (Amended 7/17/02)	VCAPCD Rule 74.20 – Adhesives and Sealants (Amended 10/9/18)
	into or within the District. • Aerosol adhesives and primers dispensed from non-refillable aerosol spray systems. • Regulated products sold in quantities of ≤ 1 fl. oz. • Adhesives used to glue flowers to parade floats • Adhesives used to fabricate orthotics and prosthetics under a medical doctor's prescription • Shoe repair, luggage, and handbag adhesives • Research and development programs and quality assurance labs • Solvent welding operations used in the manufacturing of medical devices • Adhesives used in tire repair • A facility that demonstrates that the total volume of	• The use of adhesives in tire repair provided the label states "for tire repair use only" • The use of adhesives sold or supplied with ≤ 8 fluid ounces (fl. oz.) of adhesive in non-reusable containers. • Aerosol spray adhesive products • Household adhesives • Adhesive products subject to the VOC limit requirements of Rule 4605 (Aerospace Assembly and Component Coating Operations), Rule 4607 (Graphic Arts), and Rule 4681 (Rubber Tire Manufacturing) • Contact adhesives that are subject to the Consumer Product Safety Commission regulations in 16 CFR, Part 1302, that have a flash point greater than 20°F as determined pursuant to those regulations, and that	• Material regulated by Rule 450 (Graphic Arts Operations) and Rule 456 (Aerospace Assembly and Component Coating Operations) • Materials used for tire repair if the label states "for tire repair only" • Manufacture, maintenance, or repair of undersea-based weapon systems • Low-VOC materials containing ≤ 20 g/L • Materials sold or supplied in non-reusable containers to hold no more than 8 fl. oz. • Testing and evaluation of materials in R&D laboratories, QA laboratories, or analytical laboratories • Contact adhesives subject to the Consumer Product Safety Commission regulations in 16 CFR, Part 1302, provided	• Low usage of non-complying adhesive products < 20 gal. in any calendar year • Low VOC adhesive or sealant products of < 20 g VOC/L • Adhesives in the manufacture of medical equipment • Testing and evaluation of adhesive or sealant products in R&D laboratories, QA laboratories, or analytical laboratories, or to R&D facilities which produce only non-commercial products solely for R&D purposes • Adhesives and sealants applied in Rule 11-8 (Metal, Can and Coil Operations) and Rule 8-12 (Paper, Fabric and Film), Rule 8-13 (Graphic Arts Operations), and 8-23 (Flat Wood Paneling Operations) • Adhesive and sealants shipped, supplied or	• Screen printing operations • Assembling and manufacturing of undersea-based weapon systems • Testing and evaluation of adhesive or sealant products in any research and development or analytical laboratories • Plastic welding operations used in the manufacturing of medical devices • Tire repair operations, provided the label on the adhesive used states "For Tire Repair Only" • Field installation or repair of potable water linings and covers at potable water treatment, potable water storage, or potable water distribution facilities • Manufacturing operations of the following products: diving suits, rubber fuel

Rule Element	South Coast AQMD Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	SJVAPCD Rule 4653 – Adhesives and Sealants (Amended 9/16/10)	SMAQMD Rule 460 – Adhesives and Sealants (Amended 11/30/00)	BAAQMD Rule 8-51 – Adhesive and Sealant Products (Amended 7/17/02)	VCAPCD Rule 74.20 – Adhesives and Sealants (Amended 10/9/18)
	noncompliant products is less than 55 gal. per facility per calendar year - Adhesives used in architectural applications, contact adhesives, special purpose contact adhesives, and adhesives used on porous substrates - Regulated products used in the field installation and repair of potable water linings and covers at water treatment, storage, or water distribution facilities - Regulated products with a viscosity of ≥ 200 centipoise - Thermoplastic hot melt adhesives or to regulated products offered for sale as a dry mix, containing no polymer, which are ready for use or only mixed with water prior to use, and include, but are not limited to,	are sold in packages that contain ≤ 128 fl. oz. - Stripping of cured adhesives, except the stripping of such materials from spray application equipment - A stationary source that uses ≤ 20 gal. of sealant products in a calendar year - Testing and evaluation of sealant products in research laboratories, analytical laboratories, or quality assurance laboratories - The use of aerosol adhesive or aerosol adhesive primer products - Adhesive products used in assembly, repair, or manufacture of undersea-based weapon systems - Adhesive products used in medical equipment manufacturing operations - Cyanoacrylate adhesive application processes	that adhesives are sold in packages of ≤ 128 fl. oz. - Aerosol cleaning solvents at the stationary source, provided total usage does not exceed 160 fl. oz. per day - Ethyl acetate to clean adhesive application equipment used in the manufacturing of transdermal drug delivery products, and fewer than 3 gal/day of ethyl acetate, averaged over a calendar month - Low usage of not exceeding 55 gal. during any calendar year - Cyanoacrylate adhesives - Reactive adhesives	sold to persons outside the District for use outside the District - Adhesive or sealants sold to any person who complies with the requirements of this rule - Any manufacture of adhesives or sealants, provided the manufacturer has provided the maximum VOC content and category information for the product and the product was not sold directly to a user or a sales outlet located in the District, or the product was sold to an independent distributor located in the District that is not a subsidiary of, or under the direct control of the manufacturer - VOC limits for contact bond adhesives that exceed a VOC content of 540 g/L	bladders, inflatable boats, life preservers or other stand-alone elastomeric type products designed for immersion in liquids - Inkjet printer head assembly operations where the VOC content of the adhesive used for laminating is less than 100 g/L of material - Thin film laminating operations of magnetic or electronic components excluding inkjet printer head assembly operations - Glass bonding and priming processes in automotive convertible top manufacturing operations - Any adhesive, primer, or sealant that contains less than 20 g VOC/L of material - Any aerosol adhesive - Any cyanoacrylate or methacrylate-based adhesive - Any adhesive tape

Rule Element	South Coast AQMD Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	SJVAPCD Rule 4653 – Adhesives and Sealants (Amended 9/16/10)	SMAQMD Rule 460 – Adhesives and Sealants (Amended 11/30/00)	BAAQMD Rule 8-51 – Adhesive and Sealant Products (Amended 7/17/02)	VCAPCD Rule 74.20 – Adhesives and Sealants (Amended 10/9/18)
	grouts, cements, and mortars - Products with a VOC content no more than 20 g/L, less water and less exempt compounds, or no more than 20 g/L material for low solids regulated products - Solvent welding formulations containing methylene chloride used to bond hard acrylic, polycarbonate, and polyethylene terephthalate glycol plastic fabrications, provided that the concentration of methylene chloride in any solvent welding formulation does not exceed 60% by weight; and the purchase of all solvent welding products does not exceed 20 gal. per calendar year at a single facility - Regulated products weighing ≤1 lb. or	- Processes using polyester bonding putties to assemble fiberglass parts at fiberglass boat manufacturing facilities and at other reinforced plastic composite manufacturing facilities - Adhesive products and sealant products shipped, supplied, or sold exclusively to persons outside the District for use outside the District - Adhesive products and sealant products sold to any person who complies with the VOC emission control system requirements - Cleaning of solar cells, laser hardware, scientific instruments, or high precision optics - Cleaning in laboratory tests and analyses, or bench scale or research and development projects - Cleaning of clutch assemblies where		- ABS, CPVC, PVC, and plastic welding cement primers - Adhesives or sealants in small containers that weigh ≤1 lb. or contain ≤16 fl. oz. - Contact adhesives that are subject to the Consumer Product Safety Commission regulations in 16 CFR, Part 1302, that have a flash point greater than 20°F as determined pursuant to those regulations, and that are sold in packages that contain ≤1 gal., and that are used at a home, a construction site, or at any location other than in a facility - Facilities using Contact Bond Adhesive primarily for special substrates where ≥80% of the annual contact bond adhesive use at a single facility meets the definition of “Contact Bond	- Any low pressure (less than 250 psi) or high pressure (1,000 to 1,300 psi) two-component spray polyurethane foam system that uses exempt organic compounds as the blowing agent and that uses ancillary spray equipment and hoses to apply the foam - Any one-component spray polyurethane foam system in a cylinder (containing not less than 10 lb. and not more than 23 lb. of prepolymerized mixtures) that uses exempt organic compounds as the blowing agent and that uses ancillary spray equipment or hoses to apply the foam - Any person who uses less than 10 gal. per rolling period (consisting of 12 consecutive calendar months) per stationary

Rule Element	South Coast AQMD Rule 1168 – Adhesive and Sealant Applications (Amended 11/4/22)	SJVAPCD Rule 4653 – Adhesives and Sealants (Amended 9/16/10)	SMAQMD Rule 460 – Adhesives and Sealants (Amended 11/30/00)	BAAQMD Rule 8-51 – Adhesive and Sealant Products (Amended 7/17/02)	VCAPCD Rule 74.20 – Adhesives and Sealants (Amended 10/9/18)	
	consist of ≤16 fl. oz. and have VOC content limits, unless used exclusively in the manufacture or construction of the goods or commodities or used in pollution-generating activities that take place at stationary sources, excluding maintenance and repair Manufacturer or supplier of regulated products provided the product sells to an independent distributor, informed in writing, including electronic formats, by the manufacturer or supplier, the regulated product is not used in the District	rubber bonds to metal by means of an adhesive Cleaning of paper-based gaskets		Adhesive - Special Substrates” - Tire retread adhesive in retreading off-the-road and industrial tires that are rated or used for non-highway service and have a minimum nominal rim diameter of 20 inches - Self-curing adhesives and sealants with reactive diluents	source of an adhesive, a sealant, or primer in a separate formulation provided the total volume of noncomplying adhesives, sealants, or primers at a stationary source does not exceed 55 gal. per rolling period (consisting of 12 consecutive calendar months)	
Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1168	SJVAPCD Rule 4653	SMAQMD Rule 460	BAAQMD Rule 8-51	VCAPCD Rule 74.20
	Adhesives					
	Architectural applications					
	Building envelope membrane adhesive	250	-	-	-	-
	Carpet pad adhesive	50	-	-	-	50

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Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1168	SJVAPCD Rule 4653	SMAQMD Rule 460	BAAQMD Rule 8-51	VCAPCD Rule 74.20
	Ceramic glass, porcelain, & stone tile adhesive	65	65	130	130	65
	Cove base adhesive	50	50	150	150	50
	Dry wall and panel adhesive	50	50	--	-	50
	Multi-purpose construction adhesives	70	70	200	200	70
	Roofing					
	Hot applied modified bitumen/built up roof adhesive	30	-	-	-	-
	EPDM/TPO single ply roof membrane adhesive	250	-	-	-	--
	Single ply roof membrane adhesive (except EPDM/TPO)	250	250	250	250	250
	Shingle laminating adhesive	30	-	-	-	-
	All other roof adhesives	250	300	-	300	300
	Rubber floor adhesive	60	60	-	-	60
	Structural glazing adhesive	100	100	100	100	100
	Structural wood member adhesive	140	140	-	-	140
	Subfloor adhesive	50	50	-	-	50
	VCT and asphalt tile adhesive	50	50	-	-	50
	Wood flooring adhesive	20	100	-	-	20
	All other indoor floor covering adhesives	50	150	150	150	-
	Computer diskette manufacturing adhesive	350	-	850	850	-
	Contact adhesive	80	80	250	-	80
	Edge glue adhesive	250	-	-	-	-
	Plastic welding cement					
	ABS welding cement	325	325	400	400	325
	ABS to PVC transition cement	425	250	--	--	510
	CPVC welding cement	400	490	490	490	490
	CPVC for life-safety systems	490	-	-	-	-
	Higher viscosity CPVC	490 / 400 (7/1/24)	-	-	-	-
	PVC welding cement	425	510	510	-	510
	All other plastic welding cements	100	250	450	500	500
	Rubber vulcanization adhesive	850 / 250 (1/1/28)	850	-	850	-

Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1168	SJVAPCD Rule 4653	SMAQMD Rule 460	BAAQMD Rule 8-51	VCAPCD Rule 74.20
	Special purpose contact adhesive	250	250	-	-	250
	Thin metal laminating adhesive	780	780	780	780	-
	Tire tread adhesive	100	100	100	100	100
	Top and trim adhesive	540 / 250 (1/1/28)	540	-	540	540
	Waterproof resorcinol glue	170	170	170	170	-
	All other adhesives	250	-	-	-	-
	Substrate Specific Adhesives					
	Metal	30	30	30	30	30
	Plastic foams	50	50	250	--	50
	Porous material (except wood)	50	50	120	120	50
	Wood	30	30	250	120	30
	Fiberglass	80	80	200	-	80
	Reinforced plastic composite	200	200	250	-	-
	Sealants					
	Architectural applications					
	Clear, paintable, and immediately water-resistant sealant	380 / 250 (1/1/26)	-	-	-	-
	Foam insulation	5%^	250	-	-	250
	One-component foam sealant	18%^	-	-	-	-
	High-pressure two-component foam sealant	5%^	-	-	-	-
	Low-pressure two-component foam sealant	5%^	-	-	-	-
	Grout	65	250	-	-	-
	Roadway sealant	250	250	250	250	250
	Non-staining plumbing putty	50	250	-	-	50
	Potable water sealant	100	250	-	-	100
	Roofing					
	Single ply roof membrane sealant (except cut edge)	250	450	450	450	-
	Cut edge single ply roof membrane sealant	250	-	-	-	-
	All other roof sealants	300	250	300	300	300
	All other architectural sealants	50	250	250	250	50

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Requirements	VOC Limits, g/L					
	Category	South Coast AQMD Rule 1168	SJVAPCD Rule 4653	SMAQMD Rule 460	BAAQMD Rule 8-51	VCAPCD Rule 74.20
	Marine deck sealant	760	760	250	760	760
	All other sealants	250	420	420	420	250
	Adhesive Primers					
	Plastic	550	650	400	650	-
	Pressure sensitive	785	250	-	-	785
	Traffic marking tape	150	-	150	150	150
	Vehicle glass	700	700	700	700	700
	Roof adhesive primers	250	-	250	-	-
	All other adhesive primers	250	250	250	250	250
	Sealant Primers					
	Architectural applications					
	Non-porous	250	-	250	250	250
	Porous	775	-	775	775	775
	Marine deck	760	760	760	-	760
	Modified bituminous	500	500	-	-	250
	Roof sealant primers	750	-	-	-	-
	All other sealant primers	750	750	750	750	750

^ VOC limit expressed as percent VOC by weight.

Note: Numbers after slash (/) are VOC limits at future effective dates in parentheses.

6. Other (Cleaning and Surface Coatings)

a. Overview

Major source category 299 – Other (Cleaning and Surface Coatings) accounts for 0.04 tpd of NO_x and 0.65 tpd of VOC emissions in the Basin's 2037 summer planning inventory. The only emissions in this source category are associated with facilities that use ethylene oxide and unspecified materials and solvents.

b. Evaluation

The small quantity of NO_x emissions is attributable to five facilities. Upon evaluation of facility permits, it was determined that these NO_x emissions are due to the operation of fuel combustion equipment (e.g., gas fired thermal oxidizers, heaters, etc.). For further analysis of these sources, refer to the fuel combustion section of this document.

The VOC emissions in this source category are regulated by South Coast AQMD Rule 442 – Usage of Solvents (Amended December 15, 2000), Rule 1144 – Metal Working Fluids and Direct Contact Lubricants (Amended July 8, 2010), and Rule 1171 – Solvent Cleaning Operations (Amended May 1, 2009). Rules 442 and 1171 were already examined under other categories (see 220 – Degreasing), thus only Rule 1144 is evaluated in this section (see Table 4-44). South Coast AQMD Rule 1144 already has the most stringent measures in place and is as stringent as VCAPCD Rule 74.31.

Finally, South Coast AQMD regulates facilities that use ethylene oxide under Rule 1405 – Control of Ethylene Oxide Emissions from Sterilization and Related Operations. While the primary purpose of this rule is to reduce toxic emissions of ethylene oxide, some of the requirements may also result in VOC co-benefits. For example, Rule 1405 requires operators of large and medium facilities to operate a Permanent Total Enclosure vented to pollution controls and facilities are further required to implement fence-line monitoring with a provision to curtail operations if ethylene oxide levels exceed thresholds. However, Rule 1405 does not explicitly control VOC emissions and therefore it was not further evaluated.

c. Conclusion

South Coast AQMD staff evaluated the cleaning and surface coatings source category for a potential contingency measure and concluded that there is no suitable contingency measure because the most stringent feasible controls are already in place, and no additional emission reduction opportunities could be identified.

TABLE 4-44
COMPARISON OF SOUTH COAST AQMD AND OTHER AIR DISTRICTS' RULES FOR OTHER
(CLEANING AND SURFACE COATINGS)

Rule Element	South Coast AQMD Rule 1144 – Metal Working Fluids and Direct-Contact Lubricants (Amended 7/9/10)	VCAPCD Rule 74.31 – Metalworking Fluids and Direct-Contact Lubricants (Amended 11/12/13)
Applicability	All persons who use metalworking fluids and direct-contact lubricants on products and parts during manufacture and assembly; and all manufacturers and suppliers who supply, sell, or offer for sale metalworking fluids and direct-contact lubricants for use at industrial facilities; all VOC containing fluids used for metalworking including metal removal, metal forming, metal treating or lubricating operations where the metalworking fluid or direct-contact lubricant comes into direct contact with products and parts including, but not limited to, blanking, broaching, coining, cutting, drilling, drawing, forming, forging, grinding, heading, honing, lapping, marquenching, milling, piercing, quenching, roll forming, rolling, stamping, tapping, threading, turning and wire drawing; and VOC containing fluids used for metal protection, including rust and corrosion prevention and inhibition, during the manufacture and assembly of products and parts	Any person who uses metalworking fluids or direct-contact lubricants on products or parts; and to any manufacturer or supplier who supplies, sells, or offers for sale either metalworking fluids or direct-contact lubricants for use at industrial or commercial facilities; all reactive VOC-containing fluids used for metalworking including, but not limited to, metal removal, metal forming, metal treating, or lubricating operations where the metalworking fluid or direct-contact lubricant come into contact with products or parts including, but not limited to, blanking, broaching, coining, cutting, drilling, drawing, forming, forging, grinding, heading, honing, lapping, marquenching, milling, piercing, quenching, roll forming, rolling, stamping, tapping, threading, turning, and wire drawing; and VOC-containing fluids used for metal protection, including rust and corrosion prevention and inhibition, but shall not apply to coatings, sealants, adhesives, or lubricants regulated by other District rules including, but not limited to, Rule 74.12 (Surface Coating of Metal Parts and Products), or 74.13 (Aerospace Assembly and Component Manufacturing Operations)
Exemptions	• Metalworking fluids and direct-contact lubricants subject to the California Air Resources Board consumer products regulation found in 17 CCR beginning at Section 94507 • Metalworking fluids and direct-contact lubricants sold in this District for shipment outside of this District or for shipment to other manufacturers for repackaging	• Metalworking fluids and direct-contact lubricants subject to the California Air Resources Board consumer products regulation found in 17 CCR beginning at Section 94507 • Use of any metalworking fluid or direct-contact lubricant subject to ARB Consumer Product Regulations and applied via a hand-held prepressurized non-refillable aerosol

Rule Element	South Coast AQMD Rule 1144 – Metal Working Fluids and Direct-Contact Lubricants (Amended 7/9/10)	VCAPCD Rule 74.31 – Metalworking Fluids and Direct-Contact Lubricants (Amended 11/12/13)	
	• Metalworking fluids and direct-contact lubricants subject to VOC limits in other Regulation XI rule • Lapping, sinker EDM, avionics and assembled aircraft, space vehicle components, and fluid utilizing the control device option • Facilities that demonstrate that total permitted and non-permitted facility VOC emissions do not exceed 4 tons in any calendar year, including emissions from the Super Compliant Material, as shown by annual purchase record • Use of dimethyl carbonate used as a cooling solvent in computed numerically controlled (CNC) machines where permeable media are used to maintain a vacuum that holds the part in place during cutting provided that the equipment existed at the time of rule adoption, is enclosed and an exhaust fan discharges the exhaust air from the equipment outside of the building	product, provided 100 cans or less per calendar year are used based on purchase and/or usage records • Use of any metalworking fluid or direct contact lubricant for the purpose of maintaining or repairing operator-owned machine tools • Research operations • The Sales Prohibition in Subsection B.2 shall not apply to metalworking fluids and direct-contact lubricants sold in this District for shipment and use outside of this district or for shipment to other manufacturers for repackaging • Lapping, sinker EDM, avionics, assembled aircraft or any assembled aircraft component, space vehicle components, and fluids utilizing the control equipment option • Metalworking fluids that are “Super Compliant,” (VOC content is ≤50 g/L of material). If a shop uses both super compliant and non-super compliant materials, the administrative requirements still apply to the non-super compliant materials. Any person claiming this exemption shall provide documentation or other evidence to substantiate this claim, upon request of APCD personnel. This exemption does not apply to metalworking fluids used at metal forging operations	
Requirements	VOC Limits, g/L		
	Fluid	South Coast AQMD Rule 1144	VCAPCD Rule 74.31
	Vanishing oil	50	50
	Metalworking fluid	-	-
	Metal forming	75	75
	Metal removal	-	-
	General	75	75
	Precision metal removal	130	130
	Metal treating	75	75

Rule Element	South Coast AQMD Rule 1144 – Metal Working Fluids and Direct-Contact Lubricants (Amended 7/9/10)	VCAPCD Rule 74.31 – Metalworking Fluids and Direct-Contact Lubricants (Amended 11/12/13)	
	Metal protecting	-	-
	General	50	50
	Military specified preservative	340	340
	Direct-contact lubricant	50	50

Petroleum Production and Marketing

Petroleum Production and Marketing includes four sub-categories: 310 – Oil and Gas Production, 320 – Petroleum Refining, 330 – Petroleum Marketing, and 399 – Other (Petroleum Production and Marketing). As shown in Table 4-45, Petroleum Production and Marketing accounts for 20.10 tpd and 0.59 tpd of VOC and NOx emissions, respectively, with the majority of VOC and NOx emissions from Petroleum Marketing and Petroleum Refining, respectively. Petroleum Production and Marketing facilities also operate fuel combustion equipment. However, those emissions are quantified separately in the inventory and the associated evaluation of potential contingency measures is presented in the Fuel Combustion section.

TABLE 4-45
PETROLEUM PRODUCTION AND MARKETING EMISSIONS BASED ON 2037 SUMMER
PLANNING INVENTORY IN THE SOUTH COAST AIR BASIN

Major Source Category	VOC (tpd)	NOx (tpd)
310 – Oil and Gas Production	4.47	0.01
320 – Petroleum Refining	4.44	0.55
330 – Petroleum Marketing	11.15	0.02
399 – Other (Petroleum Production and Marketing)	0.04	0.01
Total	20.10	0.59

As Petroleum Production and Marketing source categories contribute to substantial VOC emissions and comparatively few NOx emissions, much of the ensuing evaluation focuses on VOC control measures. South Coast AQMD regulates emissions from the Petroleum Production and Marketing major source categories through multiple rules as shown in the Table 4-46.

TABLE 4-46
SOUTH COAST AQMD RULES FOR PETROLEUM PRODUCTION AND MARKETING MAJOR
SOURCE CATEGORIES

Major Source Category	Applicable South Coast AQMD Rules
310 – Oil and Gas Production	Rule 462 – Organic Liquid Loading Rule 463 – Organic Liquid Storage Rule 1118.1 – Control of Emissions from Non-Refinery Flares

Major Source Category	Applicable South Coast AQMD Rules
	Rule 1148 – Thermally Enhanced Oil Recovery Wells Rule 1148.1 – Oil and Gas Production Wells Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers Rule 1176 – VOC Emissions from Wastewater Systems
320 – Petroleum Refining	Rule 462 – Organic Liquid Loading Rule 463 – Organic Liquid Storage Rule 464 – Wastewater Separators Rule 465 – Refinery Vacuum-Producing Devices or Systems Rule 466 – Pumps and Compressors Rule 466.1 – Valves and Flanges Rule 467 – Pressure Relief Devices Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations Rule 1118 – Control of Emissions from Refinery Flares Rule 1123 – Refinery Process Turnarounds Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants Rule 1176 – VOC Emissions from Wastewater Systems Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities Rule 1180 – Fenceline and Community Air Monitoring for Petroleum Refineries and Related Facilities Rule 1180.1 – Fenceline and Community Air Monitoring for Other Refineries
330 – Petroleum Marketing	Rule 461 – Gasoline Transfer and Dispensing Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations Rule 462 – Organic Liquid Loading Rule 463 – Organic Liquid Storage Rule 466 – Pumps and Compressors Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities
399 – Other (Petroleum Production and Marketing)	Rule 1176 – VOC Emissions from Wastewater Systems Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing Rule 1189 – Emission from Hydrogen Plant Process Vents

Table 4-47 presents an overview of the rules that apply to the Petroleum Production and Marketing major source categories listed in Table 4-46. The majority of these rules primarily seek to reduce VOC emissions.

TABLE 4-47
SOUTH COAST AQMD RULES FOR PETROLEUM PRODUCTION AND MARKETING

Rules	Applicability	Control Measures
Rule 461	Applies to facilities that transfer gasoline from any tank truck, trailer, or railroad tank car into a stationary storage tank and from stationary storage tank into a motor vehicle fuel tank, persons that conduct testing, installations or repairs, and manufacturers and suppliers.	See Table 4-60
Rule 461.1	Applies to mobile fueler that conducts retail or non-retail operations, persons that conduct testing, installation or repairs, and manufacturers and suppliers.	See Table 4-60
Rule 462	Applies to facilities that load organic liquids with a vapor pressure of 1.5 psia (77.5 mm Hg) or greater under actual loading conditions into any tank truck, trailer, or railroad tank car.	See Table 4-61
Rule 463	Applies to any above-ground stationary tank with a capacity of 75,000 liters (19,815 gallons) or greater used for storage of organic liquids, and any above-ground tank with a capacity between 950 liters (251 gallons) and 75,000 liters (19,815 gallons) used for storage of gasoline.	See Table 4-55
Rule 464	Applies to wastewater separators, including separator basins, skimmers, grit chambers, and sludge hoppers, used to separate petroleum-derived compounds from wastewater and wastewater separator forebay that receives the untreated, contaminated wastewater from the pre-separator flume.	See Table 4-62
Rule 465	Applies to all VOC emissions and sulfur compound emissions from any petroleum refinery vacuum-producing devices or systems including hot wells and accumulators.	See Table 4-63
Rule 466	Applies to any pump or compressor handling reactive organic compounds that has a Reid vapor pressure (RVP) greater than 80 mmHg (1.55 pounds per square inch, psi) or an absolute vapor pressure (AVP) greater than 36 mmHg (0.7 psi) at 20°C.	See Table 4-62
Rule 466.1	Applies to valves and flanges in reactive organic compound services applicable to petroleum refineries, chemical plants, and oil production fields.	See Table 4-62
Rule 467	Applies to a pressure relief valve (PRV) handling VOC used at refineries and chemical plants.	See Table 4-62
Rule 1109.1	Applies to petroleum refineries and facilities with related operations to petroleum refineries	See Table 4-10
Rule 1118	Applies to all flares used at refineries, sulfur recovery plants, and hydrogen production plants.	See Table 4-49
Rule 1118.1	Applies to owners and operators of flares that require a South Coast AQMD permit at non-refinery facilities including, but not limited to, oil and gas production facilities, wastewater treatment facilities, landfills, and organic liquid handling facilities.	See Table 4-49

Rules	Applicability	Control Measures
Rule 1123	Applies to refinery process unit turnaround.	See Table 4-64
Rule 1148	Applies to thermally enhanced oil recovery wells.	See Table 4-50
Rule 1148.1	Applies to onshore oil producing wells, well cellars, and produced gas handling operation and maintenance activities at onshore facilities where petroleum and processed gas are produced, gathered, separated, processed and stored.	See Table 4-50
Rule 1148.2	Applies to any operator of an onshore oil and gas, or injection well located in the South Coast AQMD that is conducting drilling, well completion, rework, or acidizing. Also applies to suppliers selling or distributing a chemical to the operator of an onshore oil or gas well for use as a drilling fluid, well completion fluid, or rework.	See Table 4-50
Rule 1149	Applies to the cleaning and degassing of a pipeline opened to atmosphere outside the boundaries of a facility, stationary tank, reservoir, or other container, storing or last used to store VOC.	See Table 4-58
Rule 1173	Applies to components at refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants, and pipeline transfer stations.	See Tables 4-51 and 4-52
Rule 1176	Applies to wastewater systems and associated control equipment located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities.	See Table 4-53
Rule 1177	Applies to the transfer and dispensing of LPG from any cargo tank, stationary storage tank or cylinder into any other cargo tank, stationary storage tank, cylinder, or portable storage tank.	See Table 4-57
Rule 1178	Applies to aboveground Storage Tanks at petroleum facilities with capacity equal to or greater than 75,000 liters (19,815 gallons) storing Organic Liquid; and (2) Storage Tanks with a Potential For VOC Emissions of 6 tons per year used in Crude Oil And Natural Gas Production Operations.	See Table 4-55
Rule 1180	Applies to Petroleum Refineries, Related Facilities, and their successors.	See Section 5. Miscellaneous/Other Fugitive Losses
Rule 1180.1	Applies to refineries that refine crude oil, Alternative feedstocks, or both crude oil and alternative feedstocks including, but not limited to, asphalt plants including their successors.	See Section 5. Miscellaneous/Other Fugitive Losses
Rule 1189	Applies to all hydrogen plants that produce any hydrogen for use in petroleum refining operations.	See Table 4-65

Most VOC emissions are fugitive in nature and are due to losses or leaks resulting from extraction and production, transportation and distribution, storage, refining, transfer, vehicle refueling, and fuel

dispensing. The analysis of feasible contingency measures is anticipated to be similar depending on the process that gives rise to the fugitive emissions. Rather than perform the evaluation for individual emission sources, staff identified six unique fugitive processes across all emission source categories: Refining Process Fugitive Losses, Storage Tanks and Related Losses, Gas Transmission Losses, Fuel Transfer and Dispensing Losses, Miscellaneous/Other Fugitive Losses, and Cargo Tanks Fugitive Losses. An evaluation of potential contingency measures for each of these processes is presented below.

1. Refining Process Fugitive Losses

a. Overview

VOC emissions occur when VOC are leaked from components and/or released from atmospheric process pressure relief devices (PRDs) at petroleum facilities and chemical plants, which include sumps and pits, mud degassing, valves, flanges, fittings, and pumps. Other sources of VOC emissions include oil and gas production sites like well cellars and steam drive wells; petroleum refining processes including cooling towers, wastewater treatment, catalytic cracking, and coking; and vapor recovery/flares at non-refinery facilities. Refining Process Fugitive Losses account for 7.37 tpd of VOC and 0.56 tpd of NO_x in 2037. This category is further segregated by applicable sub-categories shown in Table 4-48.

TABLE 4-48
REFINING PROCESS FUGITIVE EMISSIONS BASED ON 2037 SUMMER PLANNING
INVENTORY

Source Category	VOC (tpd)	NOx (tpd)
300 – Fugitive Losses - Sumps and Pits	0.04	0.00
301 – Fugitive Losses - Mud Degassing	0.59	0.00
302 – Fugitive Losses - Valves	1.44	0.00
303 – Fugitives: Flanges	0.05	0.00
304 – Fugitive Losses - Fittings	1.72	0.00
306 – Fugitive Losses - Pumps	0.05	0.00
308 – Fugitive Losses - Compressors	0.01	0.00
310 – Fugitive Losses - Well Heads	0.00	0.00
311 – Pneumatic Devices / Controllers	0.10	0.00
312 – Fugitive Losses - Well Cellars	0.52	0.00
313 – Gas Actuated Pneumatic Pumps	0.01	0.00
314 – Fugitive Losses - Oil/Water Separators	0.02	0.00
315 – Fugitives: Open Ended Lines	0.00	0.00
317 – Gas Well Venting - Blowdowns	0.00	0.00
320 – Vapor Recovery/Flares	0.23	0.11
333 – Dehydrators	0.39	0.00
338 – Cooling Towers	0.40	0.00
340 – Wastewater Treatment	0.97	0.00
342 – Tertiary Oil Production - Steam Drive Wells	0.01	0.00
352 – Wet Gas Stripping/Field Separator Fugitive Losses	0.03	0.00
356 – Natural Gas Production	0.00	0.00
358 – Catalytic Cracking	0.49	0.45
360 – Coking	0.27	0.00
362 – Vacuum Distillation	0.00	0.00
Total	7.37	0.56

These sources are subject to multiple South Coast AQMD rules including Rules 1109.1, 1118, 1118.1, 1148, 1148.1, 1148.2, 1173, and 1176. The evaluation is further divided into Vapor Recovery/Flares, Oil and Gas Production Wells, Liquid and Gas/Vapor Leaks, and Other Refining Operations.

b. Evaluation

i. Vapor Recovery/Flares

South Coast AQMD's Rules 1118 and 1118.1 control emissions from refinery flares and non-refinery flares, respectively. Rule 1118, adopted in 1998 and last amended on April 5, 2024, has various requirements for flaring operations, including performance targets, flare minimization plans (FMPs), flare event notification,

monthly emissions reporting, and specific cause analysis. Rule 1118 establishes a VOC emission limit of 100 pounds during flare events; events exceeding the limit require a detailed specific cause analysis and corrective measures. Rule 1118.1 was adopted on January 4, 2019 to reduce NO_x and VOC emissions from flaring produced gas, digester gas, landfill gas, and other combustible gases or vapors and to encourage alternatives to flaring. Non-refinery facilities include oil and gas production facilities, wastewater treatment facilities, landfills, organic liquid handling facilities, and others. Rule 1118.1 establishes NO_x and VOC emission limits and provides exemptions for low-use and low-emitting flares. Emission reductions from implementation of Rule 1118.1 began in 2022 and will reach their maximum level in 2025 when the rule will be fully implemented.

South Coast AQMD's Rules 1118 and 1118.1 are compared to BAAQMD Rules 12-11 and 12-12, SJVAPCD Rule 4311, VCAPCD Rule 74.35, SBCAPCD Rule 359, and SDAPCD Rule 69.7 in Table 4-49.

Refinery Flares

For hydrogen clean service flares, the NO_x performance target in Rule 1118 is 0.3 pounds per million standard cubic feet (lb/MMScf) of hydrogen production capacity. Rule 1118 addresses LPG flares by instituting a throughput threshold of 15,000 MMBtu/year, which is lower than the threshold in SJVAPCD Rule 4311 (25,000 MMBtu/year for flares at oil and gas operations or chemical operations). Operators are expected to comply with the more stringent threshold by installing an LPG recovery system (i.e., refrigeration/chiller system) or implementing flare operation changes through installing a new LPG flare or retrofitting an existing LPG flare, resulting in lower NO_x emissions. Meanwhile, VOC emission limits for flares are identical among the agencies. Therefore, staff concludes that Rule 1118 has the most stringent requirements.

Non-refinery Flares

NO_x limits under Rule 1118.1 are as stringent as those in other jurisdictions. Rule 1118.1 and SJVAPCD Rule 4311 both require either flare throughput reduction or flare replacement to meet emission limits when the applicable annual capacity threshold is exceeded. However, each jurisdiction takes a different approach to setting annual capacity thresholds. Rule 1118.1 sets annual thresholds based on a percentage of capacity that a flare is used, while SJVAPCD Rule 4311 sets annual thresholds based on heat capacity in MMBtu per year. If a flare under Rule 1118.1 exceeds its annual capacity threshold, then the operator of the flare is required to take action to reduce the throughput or comply with more stringent emission limits. Meanwhile, VOC emission limits for flares are identical among the agencies. While direct comparison of rule requirements is challenging due to the different structures of the rules, staff concludes that Rule 1118.1 is generally as stringent as those from other agencies.

TABLE 4-49
COMPARISON OF SOUTH COAST AQMD RULES 1118 AND 1118.1 WITH RULES AT OTHER AGENCIES

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
Applicability	<u>1118</u> Flaring operations at petroleum refineries, sulfur recovery plants, and hydrogen production plants <u>1118.1</u> Non-refinery facilities, including, but not limited to, oil and gas production facilities, wastewater treatment facilities, landfills, and organic liquid handling facilities	Flares at refineries	Operations involving the use of flares	Applies to any owners and operators of flares or flare stations where the total rated heat input for the unit is 1 MMBtu/hour or greater	Flares and thermal oxidizers at oil and gas production sources, petroleum refinery and related sources, natural gas services and transportation sources and wholesale trade in petroleum/petroleum products	All landfill gas flares at a municipal solid waste (MSW) landfill where the aggregate actual or potential emissions, from such flares, are at or above the federal major stationary source threshold for NOx

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
Requirements	<u>1118</u> - Monitor and record data on refinery and related flaring operations and to control and minimize flaring and related emissions - Notify South Coast AQMD of flare events (both planned and unplanned) - Minimize all flaring, except during emergencies, shutdowns, startups, and turnarounds	- Reduce emissions from flares at refineries by minimizing the frequency and magnitude of flaring - Monitoring flares in several ways that include vent gas flow and composition, pilots and purging, and video monitoring - Contains management practices for flaring such as flare minimization plans, operating and design	- Reduce flaring activities with emission limits, operation limits, requirements to monitor, record, and report flaring activities - NOx, VOC, and CO emission limits by operation category for flares at oil and gas, chemical, landfill, digester, or organic liquid loading operations - NOx and VOC emission limits for ground level enclosed flares - If emission limits cannot be met the operator must limit	- NOx, CO, and VOC emission limits for flares installed, replaced, or relocated - For flares combusting produced gas at a facility with estimated annual emissions of ≥ 5 tons of ROC or NOx, or ≥ 100 tons of CO per year: - A replaced flare's annual throughput is limited to no more	- Contains requirements for flares and thermal oxidizers including sulfur content limits, flare minimization plans, and emergency event provisions - NOx and VOC emission limits for ground level flares and thermal oxidizers exceeding 120,000 standard cubic feet per day	- The landfill gas flare shall be properly maintained and operational at all times - In the event the landfill gas flare is inoperable, the gas mover equipment shall be shut down and closed within one hour - Monitoring and record keeping requirements - NOx and CO emission limits for enclosed landfill flares

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
	• Monitor emissions and submit quarterly emissions report • Meet performance target for sulfur dioxide emissions of less than 0.5 tons per million barrels of crude processing capacity, averaged over one year • Any facility that exceeds performance targets must submit flare minimization plan and pay mitigation fees	standards, recordkeeping and reporting requirements	flaring to the required annual throughput • If annual throughput thresholds are exceeded for two consecutive years, flare operator must replace or modify flare to meet applicable NO_x and VOC limits • Refineries meet performance target for sulfur dioxide emissions of less than 0.5 tons per million barrels of crude processing capacity, averaged over one year	than 110% of the average annual throughput for three calendar years immediately preceding the submittal of the flare application. If not available, the annual throughput is limited to no more than 45 MMscf/yr		

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
	for excess emissions <u>1118.1</u> • Reduce NO_x and VOC emissions from flaring produced gas, digester gas, landfill gas, and other combustible gases or vapors and to encourage alternatives to flaring • Comply with applicable NO_x, VOC, and CO emission limits • Comply with annual percent capacity			○ A new flare's (not replacing an existing flare) annual throughput is limited to no more than 45 MMscf/yr • If the annual percent capacity exceeds the threshold for two consecutive years, submit a flare reduction plan with a statement of intent no later than 90 days of		

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
				the second exceedance		
Exemption	<u>1118</u> - Flaring as a result of a catastrophic event including a major fire or an explosion at the facility - Constitutes a safety hazard to the sampling personnel at the sampling location approved in the Flare Monitoring and Recording - Any sulfur dioxide emissions from flare events caused by external power curtailment	Flares that are used to control emissions from organic liquid storage, loading racks, marine vessel loading terminals, wastewater treatment systems, and pump seals	- Flares used for well testing, tank degassing, and pipeline degassing operations - Flares that combust regeneration gas - Emergency flares not subject to emission limits - Flares operated at municipal solid waste landfills that combust less than 2,000 million standard cubic feet (MMscf) of landfill gas per calendar year and that have	- Flares at <1 MMBtu/hour - Routing only propane or butane or a combination of propane and butane directly into the flame burner - Flares at a landfill that collects <2,000 MMScf of landfill gas per year and has either ceased accepting waste or is classified as an inert waste disposal	- Burning of sulfur, hydrogen sulfide, acid sludge or other sulfur compounds in the manufacturing of sulfur or sulfur compounds - Burning of any gas with a net heating value of less than 300 Btu/scf provided the fuel used to incinerate such gas does not contain sulfur compounds in excess of the rules set limits	Standards, Test Methods, Source Test Requirements of this rule shall not apply to an existing open landfill gas flare, which commenced operation on or before March 9, 2023

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
	beyond the operator's control (excluding interruptible service agreements), natural disasters or acts of war or terrorism 1118.1 Flares at asphalt plants, biodiesel plants, hydrogen production plants fueled in part with refinery gas, petroleum refineries, sulfuric acid plants, and sulfur recovery plants		ceased accepting waste Flares that combust only propane or butane or a combination of propane and butane	site or an asbestos contaminated waste disposal site - Flares used for well testing, tank degassing, and pipeline degassing - Flares that combust regeneration gas - Flares that emit <30 lb of NO_x per month - Flares that operate ≤200 hours per calendar year or 12-month rolling total, or	- Permitted flares at 1.7 MMBTU/hr or less are exempt from emission limits - Emergency Flares	

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
	- Flares subject to South Coast AQMD Rule 1147 - Flares routing only propane or butane or a combination of propane and butane directly into the flare burner - Flares at a landfill that collects less than 2,000 MMscf of landfill gas per calendar year and has either ceased accepting waste			with an annual throughput limit equivalent to 200 hours at rated heat input capacity or less per year or 12-month rolling total, where emergency flaring is not included in the 200-hour or equivalent limit		
Annual Capacity Thresholds	<u>1118.1</u> Non-refineries, expressed as the percentage of		Oil and gas and chemical operations: 25,000 MMBtu/year	Flare gas percent capacity:		

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
	capacity used to flare gas: - Any gas combusted in an open flare: 5% - Digester gas: 70% - Landfill gas: 20% - Produced gas: 5%		- Landfill operations: 90,000 MMBtu/year - Digester operations: 100,000 MMBtu/year - Organic liquid loading operations: 25,000 MMBtu/year	- Any gas combusted in an open flare: 5% - Digester gas: 70% - Landfill gas: 20% - Produced gas: 20%		
VOC Emission Limits	- Flares for digest gas: - Major facility: 0.038 lb/MMBtu - Flares for landfill gas: 0.038 lb/MMBtu - Flares for produced gas: 0.008 lb/MMBtu		- Flares for digester gas: - Major source: 0.038 lb/MMBtu - Flares at landfill operations: 0.038 lb/MMBtu - Flares at oil and gas/chemical operations: 0.008 lb/MMBtu	- Flares for digest gas: - Major facility: 0.038 lb/MMBtu - Flares for landfill gas: 0.038 lb/MMBtu - Flares for produced gas:	Enclosed flare exceeding 120,000 scf/day: - Without steam-assist: <10 MMBtu/hr: 0.0051 lb/MMBtu 10-100 MMBtu/hr:	

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
			- Ground-level enclose flares VOC emission standards based on heat release rate: - Without steam-assist: <10 MMBtu: 0.0051 lb/MMBtu 10-100 MMBtu: 0.0027 lb/MMBtu >100 MMBtu: 0.0013 lb/MMBtu - With steam-assist - All: 0.14 lb/MMBtu	0.008 lb/MMBtu	0.0027 lb/MMBtu >100 MMBtu/hr: 0.0013 lb/MMBtu - With steam-assist: 0.14 lb/MMBtu (as TOG)	

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
			as total organic gas (TOG)			
NOx Emission Limits	<u>1118.1</u> Non-refineries: - Digester gas at major source: 0.025 lb/MMBtu - Digester gas at minor source: 0.06 lb/MMBtu - Landfill gas: 0.025 lb/MMBtu - Produced gas: 0.018 lb/MMBtu - Other flare gas: 0.06 lb/MMBtu		- Digester operations at major source: 0.025 lb/MMBtu - Digester operations not at major source: 0.060 lb/MMBtu - Landfill operations: 0.025 lb/MMBtu - Flares at oil and gas operations or chemical operations: 0.018 lb/MMBtu - Organic liquid loading operations: 0.034 lb/1,000 gallons loaded	- Flares for digest gas: - Major facility: 0.025 lb/MMBtu - Minor facility: 0.06 lb/MMBtu - Flares for landfill gas: 0.025 lb/MMBtu - Flares for produced gas: 0.018 lb/MMBtu - Other flare gas: 0.06 lb/MMBtu	Enclosed flare exceeding 120,000 scf/day: - Without steam-assist: <10 MMBtu/hr: 0.0952 lb/MMBtu 10-100 MMBtu/hr: 0.1330 lb/MMBtu >100MMBtu/hr: 0.5240 lb/MMBtu - With steam-assist: 0.068 lb/MMBtu	Enclosed landfill gas flare: 0.06 lb/MMBtu

Rule Element	South Coast AQMD Rule 1118 – Control of Emissions from Refinery Flares (Amended 4/5/24) and Rule 1118.1 – Control of Emissions from Non-Refinery Flares (Adopted 1/4/19)	BAAQMD Rule 12-11 – Flare Monitoring at Refineries (Amended 11/3/21) and Rule 12-12 – Flares at Refineries (Amended 11/3/21)	SJVAPCD Rule 4311 – Flares (Amended 12/17/20)	VCAPCD Rule 74.35 – Flares (Adopted 9/12/23)	SBCAPCD Rule 359 – Flares and Thermal Oxidizers (Amended 5/16/24)	SDAPCD Rule 69.7 – Landfill Gas Flares (Adopted 3/9/23)
			Enclosed Flare: - Without steam-assist (100 MMBtu): 0.5240 lb/MMBtu - With steam-assist: 0.068 lb/MMBtu	- Reactive Organic Compound (ROC) liquid handling: - ROC liquid holding: 0.25 lb/MMBtu - ROC liquid transfer: 0.034 lb/1,000 gallons loaded		

ii. Oil and Gas Production Wells

Oil and gas extraction wells and production sites contribute the majority of VOC emissions within the Refining Process Fugitive Emissions source category. Well activities occur at multiple sites throughout the South Coast AQMD and may be found near residential communities. There are approximately 330 onshore oil or gas well facilities that conduct operations including drilling, well completion, well rework, and well injection activities.

South Coast AQMD has a collection of rules that regulate VOC emissions from oil and gas production facilities including Rule 1148 – Thermally Enhanced Oil Recovery Wells, Rule 1148.1 – Oil and Gas Production Wells, and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers. The purpose of Rule 1148 is to reduce VOC emissions that occur during thermally enhanced oil recovery operations. Rule 1148.1 seeks further reductions of VOC emissions from wellheads, well cellars, and the handling of produced gas through use of enhanced leak detection technology, among other requirements. The purpose of Rule 1148.2 is to gather air quality-related information on oil and gas wells for drilling, well completion, rework, and acidizing.

Oil and gas production facilities are also subject to additional South Coast AQMD rules, including, but not limited to: the storage of organic liquids is subject to Rule 463 – Organic Liquid Storage; leaks from components are subject to Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants; and wastewater systems, including sumps and wastewater separators are subject to Rule 1176 – VOC Emissions from Wastewater Systems. This section focuses on evaluation of the Rule 1148 series, while the other rules are evaluated elsewhere. Leak standards and associated requirements of Rule 1173 are discussed in the Liquid and Gas/Vapor Leaks section, Rule 1176 is discussed in the Other Refining Operations section, and Rule 463 is discussed in the Storage Tanks and Related Losses section.

South Coast AQMD Rules 1148, 1148.1, and 1148.2 are compared to rules at other agencies in Table 4-50. The comparison is limited to requirements applicable to oil and gas production facilities because other air district rules have requirements for categories other than oil and gas production. Two other agencies, SJVAPCD and Colorado Air Quality Control Commission (CAQCC), require limited use of enhanced monitoring techniques utilizing Optical Gas Imaging (OGI), while VCAPCD Rule 74.10 does not. Overall, South Coast AQMD Rules 1148, 1148.1, and 1148.2 are more stringent compared to rules at other agencies because they require more frequent visual and OGI inspections.

TABLE 4-50
COMPARISON OF SOUTH COAST AQMD RULES 1148, 1148.1, AND 1148.2 WITH RULES AT OTHER AGENCIES

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
Applicability	<u>1148</u> Wells producing crude oil by injecting steam <u>1148.1</u> Onshore oil producing wells, well cellars, and produced gas handling operation and maintenance activities at onshore facilities where petroleum and processed gas are produced, gathered, separated, processed and stored <u>1148.2</u> Onshore oil and gas, or injection wells located in the South Coast AQMD that is conducting drilling, well completion, rework, or acidizing	Components containing or contacting VOC streams at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities	Crude oil and natural gas production facilities, pipeline transfer stations, natural gas gathering and boosting stations and natural gas processing facilities	- Oil and gas operations that collect, store, or handle hydrocarbon liquids or produced water located at or upstream of a natural gas plant - Centralized oil stabilization facilities or class II disposal well facilities that emit or have the potential to emit VOC emissions ≥ 25 tpy

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
Requirements	<u>1148</u> - VOC emissions from a steam drive not to exceed 4.5 pounds per day (lb/day) - If steam drive wells are connected to a vapor control system, VOC emissions at the outlet of such a system shall average no more than 4.5 lb/day <u>1148.1</u> - TOC concentration in the well cellar not to exceed 500 ppm using U.S. EPA Method 21 - Valve keeps closed at the wellhead unless a portable container is used - Organic liquid is not stored in a well cellar - Organic liquid accumulated during equipment maintenance, drilling, well plugging, abandonment	- Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations - Shall not use any component that leaks in excess of applicable leak standards		Storage tanks emitting ≥ 2 tpy of VOC (rolling 12-month total) must have air pollution control equipment achieving 95% VOC control efficiency. If a combustion device is used, it must have a 98% design destruction efficiency for VOC

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
	operations, or well workover shall pump out no later than two days after such operations are completed - Organic liquid may store in a portable enclosed storage vessel equipped with air pollution control equipment to reduce TOC emissions to less than 250 ppm outlet concentration - Air pollution control device shall be demonstrated to be at least 95% or an outlet VOC concentration of 50 ppm <u>1148.2</u> - Operators shall notify electronically the South Coast AQMD Executive Officer no more than 10 calendar days and no less than 72 hours before starting drilling, well			

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
	completion, rework, or chemical treatment Suppliers shall provide detailed chemical information to operators, who then report to the Executive Officer			
Inspection Requirements	- Daily visual inspections: - Inspect any stuffing box not located in or above a well cellar - Inspect any stuffing box or produced gas handling and control equipment located within 328 ft (100 m) of a sensitive receptor - Weekly visual inspections: - Inspect any stuffing box located in or above a well cellar - Monthly visual inspections: - Inspect any stuffing box fitted with a stuffing box	- Daily audio-visual inspections: - Inspect accessible pumps, compressors, and pressure relief devices (PRDs) at manned facilities every 24 hours - Weekly audio-visual inspections: - Inspect accessible pumps, compressors, and PRDs at unmanned facilities weekly - Quarterly inspections:	- Natural gas facilities: - Inspect all operating pump seals, compressor seals, and pressure relief valves once per operating shift or every eight hours - Crude oil and natural gas production facilities: - Inspect all operating pump seals, compressor seals, pressure relief valves, pressure-vacuum relief valves, hatches, and polished rod stuffing boxes daily at	- The use of an OGI camera can be utilized as part of an approved leak detection and repair plan - Leak detection thresholds are quantified using a toxic vapor analyzer (TVA) or equivalent device <u>Storage Tank Inspection</u> - Weekly inspect air pollution control equipment - Storage tanks emitting ≥4 tpy (on a rolling 12-month total) must conduct audio, visual, and olfactory inspections

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
	adapter, any closed crude oil collection container, and any well shut off switch - Quarterly inspection: - Perform inspections of all well cellars according to specified test methods - Leakage response: - Conduct inspections within two days of discovering organic liquid leakage - Conduct inspections within eight hours if leakage is near sensitive receptors - Monthly TOC measurements: - Measure TOC on components identified as	- Inspect all components, including using U.S. EPA Method 21 - Annual inspection: - Inspect annually inaccessible and unsafe-to-monitor components - Visually inspect pipes annually, with follow-up testing if leaks are detected - Leak detection: - If a leak is detected during audio-visual inspections, it must be inspected using a specified test method within 24 hours - Test method - All leaks detected with the use of an OGI	manned facilities and weekly at unmanned facilities - Quarterly inspections: - Inspect all components for gaseous leaks using U.S. EPA Method 21 - Annual inspections: - Inspect annually inaccessible and unsafe-to-monitor components - Leak detection: - Measure gaseous leaks using U.S. EPA Method 21 within 24 hours of detection - Re-inspect new, replaced, or repaired components for leaks	- Each storage vessel with the potential for VOC emissions ≥ 6 tpy (controlled actual emissions) must conduct periodic performance testing of the control device Well production facilities - Facilities with uncontrolled actual VOC emissions of 1 to 6 tpy: inspect annually for component leaks using an approved instrument - Facilities with uncontrolled actual VOC emissions ≥ 6 tpy: inspect semi-annually for component leaks using an approved instrument - Repair leaks from components with any hydrocarbon above 500 ppm not associated with normal equipment operation

Rule Element	South Coast AQMD Rule 1148 – Thermally Enhanced Oil Recovery Wells (Adopted 11/5/82), Rule 1148.1 – Oil and Gas Production Wells (Amended 8/2/24), and Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (Amended 2/3/23)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23)	VCAPCD Rule 74.10 – Components at Crude Oil and Natural Gas Production Facilities, Pipeline Transfer Stations and Natural Gas Production, Storage and Processing Facilities (Amended 12/12/23)	CAQCC Regulation Number 7 – Control of Emissions from Oil and Gas Emissions Operations (Adopted 12/20/24)
	causing or likely to cause confirmed odor events • OGI inspections: ○ Conduct monthly OGI inspections on all components and well cellars ○ Quantify visible vapors within 48 hours if not repaired within 24 hours	instrument shall be measured using U.S. EPA Method 21 within two days of initial OGI leak detection or within 14 days of initial OGI leak detection of an inaccessible or unsafe-to-monitor component to determine compliance with the leak thresholds and repair timeframes	using U.S. EPA Method 21 before returning to service	

iii. Liquid and Gas/Vapor Leaks

Leaks and releases from components, including pumps, valves, compressors, PRDs, threaded pipe connectors, and other components, at petroleum facilities and chemical plants are sources of fugitive VOC emissions. The VOC leaks from these sources are subject to South Coast AQMD's Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants. Note that Rule 1173 also applies to components at oil and gas production fields that are subject to Rule 1148.1. Thus, there is some overlap between Rule 1173 and Rule 1148.1 for sources subject to both rules.

Rule 1173 contains three ozone contingency measures that will be implemented sequentially upon U.S. EPA's determination that the Basin has failed to meet Reasonable Further Progress requirements or attain the 2008 or 2015 8-hour ozone standards. The contingency measures reduce VOC emissions by requiring more frequent OGI inspections and by lowering the leak detection thresholds that require operators to perform repairs.

Rules at other agencies that are comparable to Rule 1173 include BAAQMD Rule 8-18 and SJVAPCD Rules 4409 and 4455. SJVAPCD Rule 4409 was reviewed in the Oil and Gas Production Wells section (see Table 4-50), although the evaluation excluded gas leak standards. Gas leak standards in SJVAPCD Rule 4409, in addition to the other rules identified, are evaluated in Table 4-51.

**TABLE 4-51
COMPARISON OF SOUTH COAST AQMD RULE 1173 WITH RULES AT OTHER AGENCIES**

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)												
Applicability	Applies to refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants, and pipeline transfer stations	<u>4409</u> - Applies to components containing or contacting VOC streams at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities <u>4455</u> - Applies to components containing or contacting VOC at petroleum refineries, gas liquids processing facilities, and chemical plants	Applies to equipment at refineries, chemical plants, bulk plants, and bulk terminals including, but not limited to: valves, connections, pumps, compressors, pressure relief devices, diaphragms, hatches, sight-glasses, fittings, sampling ports, meters, pipes, vessels, plugs, and gauges												
Violation Standards	- Interim Violation Standards (prior to 1/1/26)<table><tr><th>Component service</th><th>Interim violation standard</th></tr><tr><td>Light liquid and gas/vapor</td><td>50,000 ppm</td></tr><tr><td>Heavy liquid</td><td>500 ppm</td></tr></table> - Violation Standards (effective 1/1/26)<table><tr><th>Component service</th><th>Violation standard</th></tr><tr><td>Light liquid and gas/vapor</td><td>10,000 ppm</td></tr><tr><td>Heavy liquid</td><td>500 ppm</td></tr></table>	Component service	Interim violation standard	Light liquid and gas/vapor	50,000 ppm	Heavy liquid	500 ppm	Component service	Violation standard	Light liquid and gas/vapor	10,000 ppm	Heavy liquid	500 ppm	<u>4409</u> - A component shall be considered in violation if one or more conditions exist: - An open-ended line or a valve located at the end of the line is not sealed, or a second valve is not closed at all times; - A component has a major liquid leak; - A component has a gas leak >50,000 ppm; or - A component leak of the following conditions and numbering in excess of the maximum allowable number or percent specified below - A minor liquid leak; - A minor gas leak; or - A gas leak >10,000 ppm up to 50,000 ppm	-
Component service	Interim violation standard														
Light liquid and gas/vapor	50,000 ppm														
Heavy liquid	500 ppm														
Component service	Violation standard														
Light liquid and gas/vapor	10,000 ppm														
Heavy liquid	500 ppm														

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)																																																														
Leak Standards	Leak standards (prior to 1/1/26): <table><tr><th>Component type</th><th>Interim leak standard</th></tr><tr><td>Compressor or pump (light liquid)</td><td>500 ppm</td></tr><tr><td>PRD</td><td>200 ppm</td></tr><tr><td>Pump (heavy liquid)</td><td>100 ppm</td></tr><tr><td>Valve, fitting, or other devices (diaphragm, hatch, sight-glass, meter)</td><td>500 ppm</td></tr></table> Leak standards (effective 1/1/26): <table><tr><th>Component type</th><th>Leak standard</th></tr><tr><td>Compressor or light liquid pump</td><td>400 ppm</td></tr><tr><td>PRD</td><td>200 ppm</td></tr><tr><td>Heavy liquid pump</td><td>100 ppm</td></tr><tr><td>Valve, fitting, or other devices (diaphragm, hatch, sight-glass, meter)</td><td>100 ppm</td></tr><tr><td>Fin fan</td><td>100 ppm</td></tr></table>	Component type	Interim leak standard	Compressor or pump (light liquid)	500 ppm	PRD	200 ppm	Pump (heavy liquid)	100 ppm	Valve, fitting, or other devices (diaphragm, hatch, sight-glass, meter)	500 ppm	Component type	Leak standard	Compressor or light liquid pump	400 ppm	PRD	200 ppm	Heavy liquid pump	100 ppm	Valve, fitting, or other devices (diaphragm, hatch, sight-glass, meter)	100 ppm	Fin fan	100 ppm	4409 Gas leak standards (ppm as methane) <table><tr><th>Type of component</th><th>Major gas leak</th><th colspan="2">Minor gas leak</th></tr><tr><th></th><th></th><th>Liquid service</th><th>Gas/Vapor service</th></tr><tr><td>PRDs</td><td>>10,000</td><td>200–10,000</td><td>400–10,000</td></tr><tr><td>Others</td><td>>10,000</td><td>500–10,000</td><td>500–10,000</td></tr></table> Major liquid leak: a visible mist or a continuous flow of liquid Minor liquid leak: a liquid leak, except seal lubricant, that is not a major liquid leak and drips liquid at a rate of >3 drops/minute 4455 Gas leak standards (ppm as methane) <table><tr><th>Type of component</th><th>Major gas leak</th><th colspan="2">Minor gas leak</th></tr><tr><th></th><th></th><th>Liquid service</th><th>Gas/Vapor service</th></tr><tr><td>Valves</td><td>>10,000</td><td>200–10,000</td><td>400–10,000</td></tr><tr><td>Threaded connections</td><td>>10,000</td><td>200–10,000</td><td>400–10,000</td></tr><tr><td>Flanges</td><td>>10,000</td><td>200–10,000</td><td>400–10,000</td></tr><tr><td>Pumps</td><td>>10,000</td><td>500–10,000</td><td>500–10,000</td></tr></table>	Type of component	Major gas leak	Minor gas leak				Liquid service	Gas/Vapor service	PRDs	>10,000	200–10,000	400–10,000	Others	>10,000	500–10,000	500–10,000	Type of component	Major gas leak	Minor gas leak				Liquid service	Gas/Vapor service	Valves	>10,000	200–10,000	400–10,000	Threaded connections	>10,000	200–10,000	400–10,000	Flanges	>10,000	200–10,000	400–10,000	Pumps	>10,000	500–10,000	500–10,000	Leak standards: Valves shall not leak total organic compounds (TOC) in excess of 100 ppm Pumps and compressors shall not leak TOC in excess of 500 ppm Connections shall not leak TOC in excess of 100 ppm. PRDs shall not leak TOC in excess of 500 ppm If discovered by the operator, minimize a leak within 24 hours and repair it in seven days. If discovered by the APCO, repair it in 24 hours Non-repairable equipment leak: Any essential equipment leak must be <10,000 ppm and mass emissions must be determined for any leak ≥3,000 ppm within 30 days of placing on the non-repairable list Essential equipment is repaired or replaced within five years or
Component type	Interim leak standard																																																																
Compressor or pump (light liquid)	500 ppm																																																																
PRD	200 ppm																																																																
Pump (heavy liquid)	100 ppm																																																																
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Pumps	>10,000	500–10,000	500–10,000																																																														

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)												
	- For a component exceeding the applicable component leak standards: - If the component exceeds the applicable violation standards, no later than one day after detection: - Demonstrate the component does not emit visible vapors using an OGI device; or - Demonstrate the component does not exceed the applicable violation standards using an appropriate analyzer; and - Within 14 days of detection, complete repair below the applicable component leak standards. - For a visible leak from an accessible component, eliminate the visible leak no later than one day after detection - For a visible leak from an inaccessible component:	<table> <tr> <td>Compressors</td><td>>10,000</td><td>500–10,000</td><td>500–10,000</td></tr> <tr> <td>PRD</td><td>>10,000</td><td>100–10,000</td><td>200–10,000</td></tr> <tr> <td>Other component</td><td>>10,000</td><td>500–10,000</td><td>500–10,000</td></tr> </table> types	Compressors	>10,000	500–10,000	500–10,000	PRD	>10,000	100–10,000	200–10,000	Other component	>10,000	500–10,000	500–10,000	at the next schedule turnaround, whichever comes first
Compressors	>10,000	500–10,000	500–10,000												
PRD	>10,000	100–10,000	200–10,000												
Other component	>10,000	500–10,000	500–10,000												

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)
	▪ Notify the Executive Officer (EO) before the end of the operating shift, not to exceed 12 hours ▪ Eliminate the visible leak within 14 days of detection • Atmospheric process PRD requirements • Continuously monitor atmospheric process PRDs by installing tamper-proof electronic monitoring device capable of recording the duration of each release and quantifying the amount of VOC released • Following any release, conduct a failure analysis and implement corrective actions within 30 days • At a refinery with throughout >20,000 barrels per day (bpd), connect PRDs to a vapor recovery system, no later than the next turnaround: ▪ Two releases, each in excess of 500 lb VOC in a continuous 24-hr period, within any five-year period from a PRD; or		

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)																													
	- One release in excess of 2,000 lb VOC in a continuous 24-hr period from any PRD - Operator may elect to pay a mitigation fee of \$625,000 for releases and any subsequent release in excess of 500 lb VOC in a continuous 24-hr period within a five-year period																															
Repair Requirements	Limited delay of repair:<table><tr><th>Essential component type</th><th>Delay leak standard</th><th>Total # allowed</th></tr><tr><td>Valve or fitting</td><td>500 ppm</td><td>0.05% of facility total # of valves and fittings</td></tr><tr><td>Compressor or light liquid pump</td><td>500 ppm</td><td>0.05% of facility total # of compressors and light liquid pumps</td></tr></table>	Essential component type	Delay leak standard	Total # allowed	Valve or fitting	500 ppm	0.05% of facility total # of valves and fittings	Compressor or light liquid pump	500 ppm	0.05% of facility total # of compressors and light liquid pumps	4409 - Maximum allowable leaking components per inspection:<table><tr><th></th><th>≤200 components inspected</th><th>>200 components inspected</th></tr><tr><td>500–10,000 ppm</td><td>5</td><td>2% of total inspected</td></tr><tr><td>10,000–50,000 ppm</td><td>2</td><td>1% of total inspected</td></tr></table> 4455 - Maximum allowable number or percent of leaking components per inspection period:<table><tr><th>Component type</th><th>Max. # of leaks for ≤200 components inspected</th><th>Max. % or # of leaks for >200 components inspected</th></tr></table>		≤200 components inspected	>200 components inspected	500–10,000 ppm	5	2% of total inspected	10,000–50,000 ppm	2	1% of total inspected	Component type	Max. # of leaks for ≤200 components inspected	Max. % or # of leaks for >200 components inspected	- Repair thresholds:<table><tr><th>Equipment</th><th>Total # allowed</th></tr><tr><td>Valves and connections</td><td>0.15% of total # of valves</td></tr><tr><td>PRDs</td><td>0.5% of total # of PRDs</td></tr><tr><td>Pumps and compressors</td><td>0.5% of total # of pumps and compressors</td></tr></table>	Equipment	Total # allowed	Valves and connections	0.15% of total # of valves	PRDs	0.5% of total # of PRDs	Pumps and compressors	0.5% of total # of pumps and compressors
Essential component type	Delay leak standard	Total # allowed																														
Valve or fitting	500 ppm	0.05% of facility total # of valves and fittings																														
Compressor or light liquid pump	500 ppm	0.05% of facility total # of compressors and light liquid pumps																														
	≤200 components inspected	>200 components inspected																														
500–10,000 ppm	5	2% of total inspected																														
10,000–50,000 ppm	2	1% of total inspected																														
Component type	Max. # of leaks for ≤200 components inspected	Max. % or # of leaks for >200 components inspected																														
Equipment	Total # allowed																															
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Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)																											
		<table><tr><td>Valves</td><td>1</td><td>0.5% of # inspected</td></tr><tr><td>Threaded connections</td><td>1</td><td>0.5% of # inspected</td></tr><tr><td>Flanges</td><td>1</td><td>0.5% of # inspected</td></tr><tr><td>Pumps</td><td>2</td><td>1.0% of # inspected</td></tr><tr><td>Compressors</td><td>1</td><td>1 leak</td></tr><tr><td>PRD</td><td>1</td><td>1 leak</td></tr><tr><td>Other component types</td><td>1</td><td>1 leak</td></tr><tr><td>Pipes</td><td colspan="2">Max. # of leaks</td></tr><tr><td></td><td colspan="2">2</td></tr></table>	Valves	1	0.5% of # inspected	Threaded connections	1	0.5% of # inspected	Flanges	1	0.5% of # inspected	Pumps	2	1.0% of # inspected	Compressors	1	1 leak	PRD	1	1 leak	Other component types	1	1 leak	Pipes	Max. # of leaks			2		
Valves	1	0.5% of # inspected																												
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Pipes	Max. # of leaks																													
	2																													
Inspection Requirements	- Self-inspection requirements: - Audio-visual-olfactory (AVO) inspection of all accessible pumps, compressors, and atmospheric PRDs at least once per operating shift, and no more than 12 hours between AVO inspections - The same AVO inspection as above for unmanned oil and gas production and pipeline transfer stations, once per calendar week - Effective 10/1/25, an OGI inspection of each component	<u>4409</u> - Operator inspection requirements: - Daily inspections: - Audio-visual inspection of all accessible operating pumps, compressors, and PRDs at manned facilities every 24 hours - Weekly inspections: - Audio-visual inspection of all accessible operating pumps, compressors, and PRDs at unmanned facilities every week - Quarterly inspections: - Inspect all components once every quarter - Annual inspections:	All pumps and compressors shall be visually inspected daily for leaks. If a leak is observed, the concentration shall be determined within 24 hours of discovery																											

Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)																								
	once per month, unless a component will be out of service for more than 14 days of the calendar month due to turnaround ○ Analyzer inspection quarterly of all accessible components and annually of all inaccessible components ○ After every release from a PRD within one day and an additional analyzer inspection within 14 days	▪ Inspect all pipes and all inaccessible components annually. All unsafe-to-monitor components are inspected during each turnaround ● If the leak has been minimized but still exceeds the applicable leak standards, the following repair period will apply:<table><tr><th>Type of leak</th><th>Repair period in days</th><th>Extended repair period in days</th></tr><tr><td colspan="3">Gas leaks</td></tr><tr><td>Minor gas leak</td><td>7</td><td>0</td></tr><tr><td>Major gas leak >10,000 ppm but ≤50,000 ppm</td><td>3</td><td>2</td></tr><tr><td>Major gas leak ≥50,000 ppm</td><td>1</td><td>0</td></tr><tr><td colspan="3">Liquid leaks</td></tr><tr><td>Minor liquid leak</td><td>1</td><td>0</td></tr><tr><td>Major liquid leak</td><td>1</td><td>0</td></tr></table> <u>4455</u> ● Operator inspection requirements: ○ Daily inspections: ▪ Audio-visual inspection of all accessible operating pumps, compressors, and PRDs every 24 hours ○ Quarterly inspection:	Type of leak	Repair period in days	Extended repair period in days	Gas leaks			Minor gas leak	7	0	Major gas leak >10,000 ppm but ≤50,000 ppm	3	2	Major gas leak ≥50,000 ppm	1	0	Liquid leaks			Minor liquid leak	1	0	Major liquid leak	1	0	
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Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)																								
		▪ Audio-visual inspection of all components, except inaccessible or unsafe-to-monitor ones, or pipes, quarterly using specified test methods ○ Annual inspection: ▪ Inspect inaccessible components and pipes annually. Unsafe-to-monitor components are inspected during each turnaround ○ Re-inspection: ▪ Re-inspect components within 15 days after repair or replacement to ensure compliance ● If the leak has been minimized but still exceeds the applicable leak standards, the following repair period will apply: <table><thead><tr><th>Type of leak</th><th>Repair period in days</th><th>Extended repair period in days</th></tr></thead><tbody><tr><td colspan="3">Gas leaks</td></tr><tr><td>Minor gas leak</td><td>7</td><td>7</td></tr><tr><td>Major gas leak >10,000 ppm but ≤50,000 ppm</td><td>3</td><td>2</td></tr><tr><td>Major gas leak >50,000 ppm</td><td>1</td><td>0</td></tr><tr><td colspan="3">Liquid leaks</td></tr><tr><td>Minor liquid leak</td><td>1</td><td>0</td></tr><tr><td>Major liquid leak</td><td>1</td><td>0</td></tr></tbody></table>	Type of leak	Repair period in days	Extended repair period in days	Gas leaks			Minor gas leak	7	7	Major gas leak >10,000 ppm but ≤50,000 ppm	3	2	Major gas leak >50,000 ppm	1	0	Liquid leaks			Minor liquid leak	1	0	Major liquid leak	1	0	
Type of leak	Repair period in days	Extended repair period in days																									
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Rule Element	South Coast AQMD Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 11/1/24)	SJVAPCD Rule 4409 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities (Amended 6/15/23) and Rule 4455 – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (Amended 6/15/23)	BAAQMD Rule 8-18 – Equipment Leaks (Amended 9/4/24)
Ozone Contingency Measures	Contingency Measures shall be implemented sequentially upon the issuance of a final determination by U.S. EPA that the South Coast Air Basin has failed to meet RFP or attain the 2008 or 2015 ozone NAAQS <u>Stage 1 CM</u> - Repair a compressor or pump (light liquid) detected above 300 ppm, instead of 400 ppm <u>Stage 2 CM</u> - Conduct an OGI inspection of each component at least once every two weeks, instead of at least once per month, unless a component will be out of service for more than seven days of the two-week period due to turnaround <u>Stage 3 CM</u> - Repair a valve, fitting, or other device (diaphragm, hatch, sight-glass, meter) detected above 50 ppm, instead of 100 ppm	-	-

Prior to January 1, 2026, South Coast AQMD Rule 1173 has interim standards for violation leaks and component leaks which are less stringent than SJVAPCD Rule 4455. For example, the violation leak standard of light liquid/gas/vapor service component is 50,000 ppm compared to 10,000 ppm in SJVAPCD Rule 4455 as shown in Table 4-51. However, effective January 1, 2026, Rule 1173's violation leak standard will be strengthened from 50,000 ppm to 10,000 ppm, which matches the stringency of SJVAPCD Rule 4455. Component leak standards will also be lowered from 500 ppm to 400 ppm for compressors and light liquid pumps and from 500 ppm to 100 ppm for valve, fitting, and other components. The 400 ppm leak standard for compressors and pumps in Rule 1173 is the most stringent among the rules evaluated. In addition, the operator will be in violation if visible vapors are detected by South Coast AQMD via OGI unless demonstrated to be below the violation standard. As summarized in Table 4-52, with revised leak standards effective January 1, 2026, Rule 1173's leak standards are at least as stringent as those in other agencies' rules.

**TABLE 4-52
SUMMARY OF COMPONENT LEAK STANDARDS IN RULE 1173 AND OTHER AGENCY RULES***

Rule	Valves and Fittings (connectors/flanges)	Others (diaphragm, hatch, sight- glass, meter)	Pumps and Compressors	PRDs
South Coast AQMD Rule 1173 (prior to 1/1/26)	500 ppm			200 ppm
South Coast AQMD Rule 1173 (effective 1/1/26)	100 ppm		400 ppm	200 ppm (unchanged)
BAAQMD Rule 8-18	100 ppm		500 ppm	
SJVAPCD Rule 4409	500 ppm			L: 200 ppm, G/V: 400 ppm
SJVAPCD Rule 4455	L: 200 ppm, G/V: 400 ppm	L: 500 ppm, G/V: 500 ppm		L: 100 ppm, G/V: 200 ppm

* L denotes liquid leak. G/V denotes gas/vapor leak.

iv. Other Refining-Related Operations

Other Refining Operations include wastewater treatment and oil/water separators as a potential source of VOC emissions. These operations are subject to South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems. Rule 1176 has requirements for wastewater systems, sumps and waste separators, sewer lines, process drains, junction boxes, and air pollution control (APC) devices to control VOC emissions. These requirements are as stringent as comparable rules at other agencies, including SJVAPCD Rule 4402, AVAQMD Rule 1176, BAAQMD Rule 8-8, and VCAPCD Rule 74.8. Key requirements of each rule are summarized in Table 4-53.

Cooling towers, catalytic cracking, and coking also contribute to VOC and NO_x emissions. South Coast AQMD Rule 1114 – Petroleum Refinery Coking Operations applies to all petroleum refineries equipped with delayed coking units and establishes a depressurization limit of less than 2 pounds per square inch gauge (psig) prior to venting a coke drum to the atmosphere. Rule 1114 was expected to reduce VOC emissions from petroleum refinery coking operations by more than 50 percent at the time of rule adoption. Staff did not identify any other district rule comparable to Rule 1114. South Coast AQMD Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations applies to FCCUs. Catalytic cracking is a refinery process conducted in FCCUs where petroleum derivative feedstock is charged and fractured into smaller molecules in the presence of a catalyst. FCCUs are regulated by Rule 1109.1, which requires meeting NO_x limits of 2 ppm and 5 ppm at 3 percent O₂ on a 365-day and seven-day rolling average, respectively, with an interim NO_x limit of 40 ppm at 3 percent O₂ on a 365-day rolling average. Staff did not identify any other district rule comparable to Rule 1109.1 that regulates NO_x from FCCUs. Staff also evaluated requirements for FCCUs contained in 40 CFR Part 60 Subpart Ja,⁵³ which did not reveal any more stringent requirements than those in Rule 1109.1.

The only other district rule identified as being applicable to this source category is BAAQMD's Rule 11-10 which requires the monitoring of total hydrocarbon emissions and the repair of leaks from refinery cooling towers. While South Coast AQMD does not have a VOC rule applicable to cooling towers, the 2022 AQMP included control measure FUG-02, which calls for an assessment of available control technologies and practices that can reduce VOC emissions from industrial cooling towers. The assessment will be used to inform potential future rulemaking. As FUG-02 is included in the 2022 AQMP and relied upon for attainment of the 2015 ozone standard, it is ineligible for consideration as a contingency measure. Therefore, control measures for cooling towers are not further evaluated.

⁵³ Title 40, Code of Federal Regulations (CFR) Part 60 (40 CFR Part 60), Subpart Ja.
<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-60/subpart-Ja>

TABLE 4-53
COMPARISON OF SOUTH COAST AQMD RULE 1176 WITH RULES AT OTHER AGENCIES

Rule Element	South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems (Amended 9/13/96)	SJVAPCD Rule 4402 – Crude Oil Production Sumps (Amended 12/21/23)	BAAQMD Rule 8-8 – Wastewater Collection and Separation Systems (Amended 12/20/23)	AVAQMD Rule 1176 – Emissions from Wastewater System (Amended 9/13/96)	VCAPCD Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separations and Process Turnaround (Amended 7/5/83)
Applicability	Wastewater systems and associated control equipment located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities	All first, second, and third stage sumps at facilities producing, gathering, separating, processing, and/or storing crude oil in an oil field	Any person who operates a wastewater collection system and/or a wastewater separation system component	Wastewater systems and associated control equipment located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities	
Requirements	- Wastewater system VOC emissions shall not exceed 500 ppm above background levels - Sumps and wastewater separators shall have: - A floating cover equipped with seals; - A fixed cover equipped with a closed vent system vented to an APC; or	- First stage sumps are prohibited. - Second and third stage sumps shall have a control device (flexible floating cover, rigid floating cover, or fixed roof cover) properly installed, maintained, or operated	<u>Wastewater separators >760 L/day and <18.9 L/sec shall have one of the following:</u> - A solid, gasketed, fixed cover totally enclosing the separator tank, chamber, or basin liquid contents with all cover openings closed; - No cracks or gaps >0.125 inches in the	- Wastewater systems and close vent systems shall not emit VOC emissions >500 ppm above background levels - Sumps and separators shall have floating or fixed covers, or other approved control measures	Inlet distribution headers or compartments shall have solid covers with sealed openings or floating covers that extend to within 0.125 inches of the compartment or header wall at all points around the perimeter

Rule Element	South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems (Amended 9/13/96)	SJVAPCD Rule 4402 – Crude Oil Production Sumps (Amended 12/21/23)	BAAQMD Rule 8-8 – Wastewater Collection and Separation Systems (Amended 12/20/23)	AVAQMD Rule 1176 – Emissions from Wastewater System (Amended 9/13/96)	VCAPCD Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separations and Process Turnaround (Amended 7/5/83)
	○ Any other alternate control measure which is demonstrated to as effective or more effective than the above control methods ▪ Sump and wastewater separator covers, for both fixed and floating, shall: ○ Be impermeable to VOC and free from holes, tears, or openings ○ Drains on covers be provided with a slotted membrane fabric cover over at least 90% of the open area ○ Gauging or sampling openings on the separator be covered. Covers shall be kept closed, with no visible gaps between the cover and the separator ○ Hatches on covers shall be kept closed and free of gaps	• Cover material shall be impermeable to VOC, with no holes or tears • All hatches shall be kept closed and gap-free • If a sump is replaced by an above-ground tank, the tank shall comply with Rule 4623 or have a pressure/vacuum vent sent to within 10% of the maximum allowable working pressure	roof or between the roof and wall; • A floating pontoon or double-deck vapor-tight type cover ○ No gap between the separator wall and liquid-mounted primary seal >1.5 inch ○ No gap between the separator wall and secondary and wiper seal >0.06 inch ○ Primary and secondary seal gap inspection; or • TOC vapor recovery system with an efficiency of ≥95% <u>Wastewater separators ≥18.9 L/sec shall have one of the following:</u>	to limit VOC emissions • Sewer lines and process drains shall be enclosed and sealed to prevent VOC emissions • Junction boxes shall be totally enclosed with a solid, gasketed, fixed cover or a manhole cover. Each fixed cover shall be allowed to have an open vent pipe no more than 4 inches diameter and at least 3 feet in length. Each manhole cover shall be allowed to have openings totaling no more than 12 square inches. The	• Gauging and sampling devices shall have covers that remain closed

Rule Element	South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems (Amended 9/13/96)	SJVAPCD Rule 4402 – Crude Oil Production Sumps (Amended 12/21/23)	BAAQMD Rule 8-8 – Wastewater Collection and Separation Systems (Amended 12/20/23)	AVAQMD Rule 1176 – Emissions from Wastewater System (Amended 9/13/96)	VCAPCD Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separations and Process Turnaround (Amended 7/5/83)
	○ The perimeter of a cover, except for a floating cover, form a seal free of gaps with the foundation attached to it ○ A floating cover shall be designed and maintained such that the gap between the separator or sump wall and the seal exceeds no greater than $\frac{1}{8}$ inch for a cumulative length of 97% of the perimeter of the separator. No gap between the wall and the seal shall exceed $\frac{1}{2}$ inch ○ For initial modification of sumps, separator forebays, clarifiers, dissolved air floating tanks, induced gas floatation tanks, or induced air floating tanks, compliance shall be achieved no later than six months after issuance		● A solid, vapor-tight, full contact fixed cover totally enclosing the separator tank, chamber, or basin liquid contents with all cover openings closed and sealed; ● A floating pontoon or double-deck vapor-tight type cover ○ No gap between the separator wall and liquid-mounted primary seal >1.5 inch ○ No gap between the separator wall and secondary and wiper seal >0.06 inch ○ Primary and secondary seal gap inspection; ● A vapor-tight fixed cover with a TOC	manhole cover shall remain fully closed, except when opened for active inspection, maintenance, sampling, or repair ● APC devices shall meet one of the following: ○ Achieve a control efficiency of $\geq 95\%$ ○ Ensure VOC emissions <500 ppm above background levels ○ Any APC device or other alternative system collects vapors through a closed vent system and	

Rule Element	South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems (Amended 9/13/96)	SJVAPCD Rule 4402 – Crude Oil Production Sumps (Amended 12/21/23)	BAAQMD Rule 8-8 – Wastewater Collection and Separation Systems (Amended 12/20/23)	AVAQMD Rule 1176 – Emissions from Wastewater System (Amended 9/13/96)	VCAPCD Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separations and Process Turnaround (Amended 7/5/83)
	of a permit to construct (PC) • Sewer lines shall: ○ Be completely enclosed that no liquid surface is exposed to the atmosphere. The manhole cover remains fully closed ○ All openings in the sewer line manhole covers be completely sealed • Process drains shall be equipped water seal controls or any other alternative control measure, which is demonstrated to be at least equivalent to water seal controls in reducing VOC emissions. • Junction boxes shall: ○ Be totally enclosed with a solid, gasketed, fixed cover or a manhole cover ○ For initial modification of junction boxes,		vapor recovery system with an efficiency of $\geq 95\%$; or • TOC concentration measured at the roof seals, fixed cover, access doors, pressure/vacuum valve, and other openings shall not exceed 1,000 ppm • Oil-water separator air flotation, oil-water separator effluent channel: TOC vapor recovery system with a combined efficiency of $\geq 70\%$ • Wastewater collection/separation system at refineries: $\geq 95\%$ combined efficiency. Outlet VOC emissions of 500 ppm	subsequently controls the vapors in a device	

Rule Element	South Coast AQMD Rule 1176 – VOC Emissions from Wastewater Systems (Amended 9/13/96)	SJVAPCD Rule 4402 – Crude Oil Production Sumps (Amended 12/21/23)	BAAQMD Rule 8-8 – Wastewater Collection and Separation Systems (Amended 12/20/23)	AVAQMD Rule 1176 – Emissions from Wastewater System (Amended 9/13/96)	VCAPCD Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separations and Process Turnaround (Amended 7/5/83)
	compliance shall be achieved no later than six months after issuance of initial PC for the DSC controls • APC devices shall meet one of the following: ○ An APC device receiving vapors from a closed vent system achieves a control efficiency of $\geq 95\%$ by weight of VOC ○ The outlet of the APC device does not emit VOC emissions > 500 ppm above background ○ Any APC or other alternate system that collects vapors through a closed vent system and subsequently controls the vapors in a device and provides an equivalent level of VOC control as specified above				

c. Conclusion

South Coast AQMD rules are generally at least as stringent as and, in some cases, more stringent than other agencies' rules. Therefore, staff did not identify any potential contingency measures for these rules.

2. Storage Tanks and Related Losses

a. Overview

Organic liquid storage tanks account for 0.33 tpd of VOC and zero NOx emissions in 2037. Storage tanks emit VOC through openings inherent in the tank design. Storage Tanks and Related Losses are subject to South Coast AQMD's Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities and Rule 463 – Organic Liquid Storage. Rule 1178, amended in September 2023, requires leak detection and repair through OGI for organic liquid storage tanks at any petroleum facility that emit more than 40,000 pounds (20 tons) per year of VOC as reported in the Annual Emissions Report (AER) pursuant to Rule 301 – Permit Fees in any emission inventory year starting with the emissions inventory year 2000. There are a total of 1,093 stationary tanks subject to Rule 1178 and 55 individually permitted portable tanks and 25 permitted portable tank systems consisting of up to 20 portable tanks for each permit. In this category, there are three applicable sub-categories: Floating Roof Tanks – Working Losses, Storage Tanks: Condensate, and Fixed Roof Tanks – Working Losses. Fixed Roof Tanks – Working Losses account for the vast majority of the emissions. South Coast AQMD's Rule 463 – Organic Liquid Storage and Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities apply to this source category as shown in Table 4-54.

TABLE 4-54
STORAGE TANKS AND RELATED LOSSES BASED ON 2037 SUMMER PLANNING INVENTORY

Source Category	VOC (tpd)	NOx (tpd)
321 – Tank (Unspecified)	0.00	0.00
322 – Floating Roof Tanks – Breathing Losses	0.00	0.00
324 – Floating Roof Tanks – Working Losses	0.08	0.00
325 – Storage Tanks: Condensate	0.01	0.00
326 – Fixed Roof Tanks – Breathing Losses	0.00	0.00
328 – Fixed Roof Tanks – Working Losses	0.24	0.00
332 – Pressure Tanks	0.00	0.00
Total	0.33	0.00

Rule 463 limits VOC emissions from organic liquid storage tanks that are not subject to the requirements of Rule 1178. Rule 463 applies to (1) above-ground stationary tanks with approximate capacities of 19,800 gallons or more; (2) above-ground tanks with approximate capacities between 250 and 19,800 gallons that are used to store gasoline; and (3) any stationary tank with a potential for VOC emissions of 6 tpy or greater used in crude oil and natural gas production operations. Rule 463 applies to approximately 1,600 tanks,

including fixed roof, floating roof, or domed roof storage tanks, located at 429 facilities including refineries, bulk storage, loading, and oil production facilities within the South Coast AQMD jurisdiction.

b. Evaluation

Rule 1178 establishes requirements for rim seal gaps, secondary seals, emission control systems, doming, testing, implementation and monitoring. The rule also establishes enhanced leak detection and repair (LDAR) and more stringent control requirements. It requires weekly OGI inspections for tank farms and semi-annual OGI inspections on individual floating roof tank components. It also requires doming for crude oil tanks, and full implementation for doming will occur in 2038 for most tanks. Certain facilities have an alternative doming schedule that will require full implementation in 2041. Rule 1178 also requires secondary seals on all floating roof tanks, which will be required the next time the tank is emptied and degassed but no later than 2033.

Like Rule 1178, Rule 463 has requirements for floating or fixed roofs, rim seals, an emission control system, and OGI inspections. Last amended on June 7, 2024, Rule 463 contains a contingency measure for both the South Coast Air Basin and Coachella Valley that requires more frequent OGI inspections to facilitate leak detection and repair. If the contingency measure is triggered, it will only apply to tanks within the nonattainment area in which it was triggered.

Both Rules 1178 and 463 have gap requirements for secondary seals that are as stringent as those at other agencies such as SJVAPCD's Rule 4623 and U.S. EPA's 40 Code of Federal Regulations (CFR) Part 60, Subpart Kb. For example, the lengths of gaps greater than 1/2 inch wide cannot, when totaled together, exceed 10 percent of the length of the circumference. The length of gaps greater than 1/8 inch wide cannot, when totaled together, exceed 30 percent of the length of the circumference. Both Rules 1178 and 463 are compared with rules at other agencies in Table 4-55.

**TABLE 4-55
COMPARISON OF SOUTH COAST AQMD RULES 1178 AND 463 WITH RULES AT OTHER AGENCIES**

Rule Element	South Coast AQMD Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (Amended 9/1/23)	South Coast AQMD Rule 463 – Organic Liquid Storage (Amended 6/7/24)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 6/15/23)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)	U.S. EPA 40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
Applicability	- Storage tanks at facilities emitting ≥ 20 tpy in any year since 2000 that have: - Capacity of $\geq 19,815$ gallons and stores organic liquid with TVP > 0.1 psia; or - PTE of ≥ 6 tpy used in crude oil or natural gas production	- Stationary above-ground storage tanks with capacity $\geq 39,630$ gallons storing liquids with TVP of ≥ 0.5 psia - Stationary above-ground storage tanks from 19,815–39,630 gallons storing material with TVP of ≥ 1.5 psia - Above-ground storage tanks from 251 gal to 19,815 gallons storing gasoline - Any tank with PTE of ≥ 6 tpy used in crude oil or natural gas	Storage tanks with capacity $\geq 1,100$ gallons	Storage tanks containing organic liquids, including gasoline, solvents, and other similar materials at refineries, bulk plants, and gasoline stations	- Storage constructed, reconstructed or modified after July 23, 1984 with capacity of ≥ 75 m³ - Tanks with capacity of 19,185–39,889 gallons with a vapor pressure between 4 psia and 11.1 psia - Tanks with capacity $> 39,889$ gallons with vapor pressure between 0.75 psia and 11.1 psia

Rule Element	South Coast AQMD Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (Amended 9/1/23)	South Coast AQMD Rule 463 – Organic Liquid Storage (Amended 6/7/24)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 6/15/23)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)	U.S. EPA 40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
		production operations			
Requirements	- Seals/covers on all roof openings - Rim seal systems consisting of primary and secondary seals on all floating roof tanks - Vapor recovery with 98% efficiency on all fixed roof tanks - Gap requirements for primary and secondary seals - Doming for crude oil tanks	- Seals/covers on all roof openings - Rim seals consisting of primary and secondary seals on all floating roof tanks - Vapor recovery systems on fixed roof tanks with at least 98% reduction by weight - Gap requirements for primary and secondary floating roof seals - Doming for external floating roof tanks storing organic liquids with a TVP of ≥ 3.0 psia	- Seals and covers on all roof openings - Rim seal systems consisting of primary and secondary seals on all floating roof tanks - Vapor recovery with minimum efficiency of 95% by volume on all fixed roof tanks - Gap requirements for primary and secondary seals	- Vapor recovery with an overall abatement efficiency of $\geq 95\%$ on all fixed roof tanks. - Gap requirements for secondary seals	- Seals and covers on all roof openings - Rim seals consisting of primary and secondary seals - Vapor recovery of 95% by volume on all fixed roof tanks - Gap requirements for primary and secondary seals - Fixed roofs with internal floating roofs only require one seal - External floating roofs require two seal system ≥ 76.6 kPa (11 psia) must have a control device or equivalent (fixed roof

Rule Element	South Coast AQMD Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (Amended 9/1/23)	South Coast AQMD Rule 463 – Organic Liquid Storage (Amended 6/7/24)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 6/15/23)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)	U.S. EPA 40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
		Contingencies for the applicable ozone NAAQS			and internal floating roof)
Monitoring	- Periodic gap measurements for floating roof tanks - Periodic Method 21 measurements for fixed roof tanks - Weekly OGI monitoring for all tanks and additional semi-annual OGI inspections for floating roof tanks	- Periodic gap measurements for floating roof tanks - OGI tank farm monitoring every two weeks for all tanks and additional semi-annual OGI inspections for floating roof tanks	- Annual gap measurements for external floating roof tanks - Gap measurements for internal floating roof tanks at least once every 60 months - Voluntary annual visual and U.S. EPA Method 21 inspections for all tanks	- Periodic gap measurements for floating roof tanks - Visual inspections of internal floating roof tanks twice per year	- Measurements of gaps between the tank wall and the primary seal (seal gaps) shall be performed during the hydrostatic testing of the vessel or within 60 days of the initial fill with volatile organic liquid and at least once every five years thereafter - Measurements of gaps between the tank wall and the secondary seal shall be performed within 60 days of the initial

Rule Element	South Coast AQMD Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (Amended 9/1/23)	South Coast AQMD Rule 463 – Organic Liquid Storage (Amended 6/7/24)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 6/15/23)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)	U.S. EPA 40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
					fill with volatile organic liquid and at least once per year thereafter

c. Conclusion

South Coast AQMD's Rule 1178 and Rule 463 are at least as stringent as and, in some areas, more stringent than rules at other agencies for Storage Tanks and Related Losses. Therefore, staff did not identify any potential contingency measures for these rules.

3. Gas Transmission and Dispensing Losses

a. Overview

The Gas Transmission and Dispensing Losses category accounts for 4.22 tpd of VOC and zero NOx emissions in 2037. In this category, there are three applicable sub-categories: Natural Gas Transmission Losses, LPG Transfer and Dispensing Losses, and Storage Tanks and Pipeline Cleaning and Degassing. LPG Transfer and Dispensing Losses account for the vast majority of the emissions. South Coast AQMD's Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing and Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing apply to this source category as shown in Table 4-56.

**TABLE 4-56
GAS TRANSMISSION AND DISPENSING EMISSIONS BASED ON 2037 SUMMER PLANNING
INVENTORY**

Source Category	VOC (tpd)	NOx (tpd)
318 – Natural Gas Transmission Losses	0.43	0.00
319 – LPG Transfer and Dispensing Losses	3.70	0.00
386 – Storage Tanks and Pipeline Cleaning and Degassing	0.09	0.00
Total	4.22	0.00

b. Evaluation

South Coast AQMD Rule 1177 applies to the transfer of LPG to and from stationary storage tanks, cylinders and cargo tanks, including bobtail trucks, tanker or transport trucks and railroad tank cars, as well as into portable tanks and cylinders. Based on LPG low emission connector and low emission fixed liquid level gauge (FLLG) technologies that were available at the time of rule adoption, Rule 1177 was estimated to reduce VOC emissions by more than 70 percent upon full implementation. Table 4-57 summarizes key requirements.

TABLE 4-57
KEY REQUIREMENTS OF SOUTH COAST AQMD RULE 1177

Rule Element	South Coast AQMD Rule 1177 – Liquefied Petroleum Gas Transfer and Dispensing (Adopted 6/1/12)
Applicability	Transfer of LPG from any cargo tank, stationary storage tank or cylinder into any other cargo tank, stationary storage tank, cylinder, or portable storage tank
Exemptions	• Transfer of LPG into any container with a water capacity of less than 4 gallons • Facilities that are subject to the requirements of Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants • LPG cylinders that are specifically dedicated for and installed for use with recreational vehicles
Requirements	• Require use of LPG low emission connectors to limit the discharge of LPG upon disconnection to four cubic centimeters or less by July 1, 2013 • Require use of LPG low emission connectors to limit discharge to four cubic centimeters or less by July 1, 2013 • Require all LPG-receiving containers to be filled using FLLG by July 1, 2017, or use an equivalent technique that complies with fire protection laws • Implement a Leak Detection and Repair program with routine leak checks using a bubble test and maintenance of vapor recovery systems • Require records of low emission FLLG and LPG connector installations, leak repairs, and maintenance of vapor recovery systems • Require annual reports for LPG facilities, including monthly purchase and dispensing volumes (2013-2015), year-end inventories (2013-2017), and connector installations (2013)

The only comprehensive rule at other agencies pertaining to LPG transfer and dispensing is the VCAQMD Rule 74.33 – Liquefied Petroleum Gas Transfer or Dispensing (adopted January 13, 2015) which is based on South Coast AQMD Rule 1177 (adopted June 1, 2012). As Rule 74.33 is equivalent to Rule 1177, staff did not identify any control measure to be considered as a contingency measure for this source category.

In addition to Rule 1177, South Coast AQMD regulates this source category through Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing. Table 4-58 contains a comparison of South Coast AQMD Rule 1149, SJVAPCD Rule 4623 – Storage of Organic Liquids, AVAQMD Rule 1149 – Storage Tank Cleaning and Degassing, and BAAQMD Rule 8-5 – Storage of Organic Liquids. South Coast AQMD, SJVAPCD, and BAAQMD rules are generally similar, although South Coast AQMD Rule 1149 and SJVAPCD Rule 4623 are more stringent by requiring that the VOC concentrations within the tank or pipeline be reduced to 5,000 ppm or less for cleaning and degassing operations. While AVAQMD Rule 1149 requires at least 90 percent efficiency for any control measure in reducing VOC emissions (as opposed to limiting VOC concentrations), staff have not found any indication that this requirement is more stringent than South Coast AQMD Rule 1149.

**TABLE 4-58
COMPARISON OF SOUTH COAST AQMD RULE 1149 WITH RULES AT OTHER AGENCIES**

Rule Element	South Coast Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing (Amended 5/2/08)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 06/15/23)	AVAQMD Rule 1149 – Storage Tank Cleaning and Degassing (Amended 07/14/95)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)
Applicability	The purpose of this rule is to reduce VOC and toxics emissions from roof landings, cleaning, maintenance, testing, repair and removal of storage tanks and pipelines. This rule applies to the cleaning and degassing of a pipeline opened to atmosphere outside the boundaries of a facility, stationary tank, reservoir, or other container, storing or last used to store VOC	The purpose of this rule is to limit VOC emissions from the storage of organic liquids. This rule applies to any tank with a capacity of 1,100 gallons or greater in which any organic liquid is placed, held, or stored	This rule applies to the cleaning and degassing of a stationary tank, reservoir, or other container storing or last used to store Volatile Organic Compounds	The purpose of this rule is to limit emissions of organic compounds from storage tanks
Control Measure	For stationary tank, reservoir, or container the emissions are controlled by one of the following: (A) Liquid balancing; or (B) Other control techniques such that the gaseous VOC concentration within the tank, reservoir or other container is reduced to <5,000 ppm, measured as methane, for at least one hour after degassing operations have ceased	For Tank Degassing operations, organic vapors shall be minimized by exhaust VOC contained in the tank vapor space to a vapor recovery system until the organic vapor concentration is ≤5,000 ppm, or is ≤10% of the lower explosion limit (LEL), whichever is less	Above-ground stationary tank subject to this rule: during cleaning or degassing operations, emissions are controlled by: (A) Liquid balancing (B) Negative pressure displacement and subsequent incineration (C) A refrigerated condenser which reduces the vapor temperature to ≤100°F,	For tanks larger than 75 m³, the emissions of organic compounds resulting from degassing shall be controlled by an abatement device that collects and processes all organic vapors and gases and has an abatement efficiency of at least 90% by weight. The system shall be operated until the concentration of

Rule Element	South Coast Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing (Amended 5/2/08)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 06/15/23)	AVAQMD Rule 1149 – Storage Tank Cleaning and Degassing (Amended 07/14/95)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)
	- The roof of a floating storage tank containing or last containing a VOC liquid emissions are controlled by one of the following: (A) The vapor space created is vented to a control device approved by the Executive Officer; or (B) The gaseous VOC concentration within the tank, reservoir or other container is reduced to <5,000 ppm, measured as methane, for at least one hour after degassing operations have ceased - For pipelines the emissions are controlled by one of the following: A) The gaseous VOC concentration within the pipeline is reduced to <5,000 ppm, measured as methane, for at least one hour after degassing operations have ceased; or B) The gaseous VOC concentration outside the pipeline, as measured pursuant to paragraph (d)(1) while the pipeline is open, is <5,000 ppm, measured as methane	During tank cleaning operations; 1) while performing tank cleaning activities, operators may use the following cleaning agents: diesel, solvents with an initial boiling point of >302°F, solvents with a vapor pressure of <0.5 psia, or solvents with 50 grams per liter VOC content or less. 2) Steam cleaning shall be allowed at locations where wastewater treatment facilities are limited or during the months of December through March	and capable of handling the displaced vapors (D) Any other control method or control equipment that has been approved by the Executive Officer or designee to be at least 90% efficient in reducing VOC emissions Underground Storage Tanks: A person shall not allow cleaning or degassing of any underground storage tanks subject to this rule unless the VOC emissions are controlled by a device that has been approved by the Executive Officer or designee to be at least 90% efficient	organic compounds in the tank is <10,000 ppm expressed as methane. In order to satisfy this requirement, effective June 1, 2007, the residual organic concentration must be measured to be <10,000 ppm as methane for at least four consecutive measurements performed at intervals no shorter than 15 minutes each Effective June 1, 2007, tank interior cleaning agents must meet the following requirements, unless all organic vapors and gases emitted during tank cleaning are collected and processed at an abatement device that has an abatement efficiency of at least 90% by weight. Agents used to clean tank interiors shall have an initial boiling point greater

Rule Element	South Coast Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing (Amended 5/2/08)	SJVAPCD Rule 4623 – Storage of Organic Liquids (Amended 06/15/23)	AVAQMD Rule 1149 – Storage Tank Cleaning and Degassing (Amended 07/14/95)	BAAQMD Rule 8-5 – Storage of Organic Liquids (Amended 11/3/21)
	Vacuum trucks used to remove liquid, sludge or vapors from tanks or pipelines subject to this rule shall not exhaust vapors to the atmosphere >500 ppm, measured as methane			than 302°F, a true vapor pressure <0.5 psia, or a VOC content <50 g/L

c. Conclusion

South Coast AQMD Rules 1149 and 1177 are the most stringent and staff did not identify any potential contingency measures for these rules.

4. Fuel Transfer and Dispensing Losses

a. Overview

Rule 461 – Gasoline Transfer and Dispensing was adopted in January 1976 and regulates stationary and mobile gasoline dispensing facilities that dispense into motor vehicles. Rule 461 controls VOC and toxic air contaminant emissions during the filling of storage tanks and when dispensing gasoline from both stationary gasoline dispensing facilities and mobile fuelers into motor vehicles. The primary toxic air contaminants associated with gasoline vapors are benzene, ethyl benzene, and naphthalene, which are carcinogens. Provisions for mobile fueler transfer and dispensing of gasoline have been included in Rule 461 since 1995 and rely on the same approach as stationary gasoline dispensing which requires use of Phase I and Phase II vapor recovery systems that are tested and certified by CARB. Although Rule 461 includes provisions for mobile fuelers that dispense fuel into motor vehicles, the variation of retail mobile fuelers was not envisioned when these provisions were established over 20 years ago. Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations was adopted on January 7, 2022 to ensure that CARB certified vapor control systems are installed for retail mobile fuelers, to address the current status of CARB certified vapor recovery systems for mobile fuelers, to restrict operation near a school during school hours, and to establish other requirements for retail and non-retail mobile fuelers.

Fuel Transfer and Dispensing Losses account for 3.15 tpd of VOC and zero NO_x emissions in 2037. The VOC emissions for this source category are attributed to gasoline wholesale facility point sources, fuel dispensing tanks – working/breathing losses, gasoline storage bulk plants/terminals, tank trucks/railcars, and underground storage tanks. This category is broken down to applicable sub-categories shown in Table 4-59.

**TABLE 4-59
FUEL TRANSFER AND DISPENSING LOSSES BASED ON 2037 SUMMER PLANNING
INVENTORY**

Source Category	VOC (tpd)	NOx (tpd)
330 – Underground Tanks	0.03	0.00
366 – Tanker Loading	0.00	0.00
368 – Barge Loading	0.00	0.00
374 – Fuel Dispensing Tanks – Working Losses	0.86	0.00
376 – Fuel Dispensing Tanks – Breathing Losses	0.13	0.00
378 – Vehicle Refueling – Vapor Displacement Losses	0.15	0.00
380 – Vehicle Refueling – Spillage	1.22	0.00
381 – Vehicle Refueling – Hose Permeation	0.07	0.00
382 – Bulk Plants/Terminals – Gasoline Storage – Breathing Losses	0.00	0.00
384 – Bulk Plants/Terminals – Gasoline Storage – Working Losses	0.12	0.00
390 – Tank Cars and Trucks – Working Losses	0.19	0.00
392 – Tank Cars and Trucks – In-Transit Breathing Losses	0.00	0.00
393 – Tank Trucks/Railcar Working Loss	0.38	0.00
394 – Tanker/Barge – In-Transit Breathing Losses	0.00	0.00
Total	3.15	0.00

b. Evaluation

Table 4-60 compares the South Coast AQMD Rules 461 and 461.1 with rules at other agencies including MDAQMD Rule 461 – Gasoline Transfer and Dispensing, AVAQMD Rule 461 – Gasoline Transfer and Dispensing, SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants, and SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks. The analysis shows that South Coast AQMD’s rules are generally as stringent as or more stringent than other agencies. For example, the vapor recovery system requirements in Rules 461 and 461.1, which require the recovery of 98 percent (Phase I) and 95 percent (Phase II) of displaced gasoline vapors, are the most stringent. The technologies to drain spillage for underground tanks is gravity-based in AVAQMD and MDAQMD while South Coast AQMD requires a spill box equipped with integral drain valve. While they are different, they both emphasize no spillage and are likely equivalent.

Additionally, pertaining to emissions from Gasoline Dispensing Tanks, Table 4-61 shows the comparison between South Coast AQMD’s Rule 462 – Organic Liquid Loading, with AVAQMD Rule 462, BAAQMD Rule 8-33, and MDAQMD Rule 462. For a subcategory of applicable sources (Class B facilities), South Coast AQMD Rule 462 is potentially not as stringent as MDAQMD Rule 462. Class B facilities are required to be equipped with CARB certified vapor recovery devices or, in the absence of CARB certification, a device approved by South Coast AQMD that is designed to recover at least 90 percent of vapors. MDAQMD Rule

462 requires a 95 percent vapor recovery efficiency. However, South Coast AQMD's compliance records indicate that the actual control efficiency exceeds 95 percent. Therefore, there would be no emission reductions associated with increasing the minimum control efficiency in Rule 462 from 90 to 95 percent.

For vapor recovery systems used at gasoline bulk loading terminals, BAAQMD Rule 8-33 requires a vapor recovery system to emit no more than 0.04 pounds of VOC per 1,000 gallons of organic liquid loaded at gasoline bulk terminals. In comparison, the limit in South Coast AQMD Rule 462 is 0.08 pounds per 1,000 gallons of liquid loaded for facilities loading 20,000 gallons or more on any one day. While Rule 462 differentiates requirements by facility throughput, BAAQMD Rule 8-33 does not. The vapor recovery technology needed to demonstrate compliance with BAAQMD Rule 8-33 exists and this measure is therefore technologically feasible. However, reducing the emission rate from 0.08 to 0.04 pounds per 1,000 gallons could cost between \$100,000 for minor modifications to the vapor recovery control device and several millions of dollars for major modifications (e.g., replacing the control device). Based on staff's evaluation, the cost-effectiveness is estimated to be between \$110,000 and \$250,000 per ton of VOC reduced.⁵⁴ Therefore, lowering the VOC emission limit as a contingency measure is not economically feasible. In addition, facilities would likely require more than two years to implement modifications to control devices to achieve the lower limit.

As of January 2025, South Coast AQMD is in the process of amending Rule 462. The rule amendment is expected to further enhance the stringency by requiring OGI inspections and lowering VOC leak detection thresholds.⁵⁵ Therefore, no further opportunity to reduce emissions through a contingency measure exists in this category.

⁵⁴ Detailed evaluation can be found in the 2022 AQMP, Appendix VI-A: RACM Demonstration, p. VI-A-54. <https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/appendix-vi.pdf?sfvrsn=12>

⁵⁵ South Coast AQMD, Proposed Amended Rule 462 – Organic Liquid Loading. <http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-462>

TABLE 4-60
COMPARISON OF SOUTH COAST AQMD RULES 461 AND 461.1 WITH RULES AT OTHER AGENCIES

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
Applicability	Transfer of gasoline from any tank truck, trailer, or railroad tank car into any stationary storage tank, and from any stationary storage tank into any motor vehicle fuel tank	Retail and nonretail mobile fuelers that are transferring or dispensing gasoline	Transfer of gasoline from any tank truck, trailer, or railroad tank car into any stationary storage tank or mobile fueler, and from any stationary storage tank or mobile fueler into any mobile fueler or motor vehicle fuel tank	Transfer of Gasoline from any tank truck, or railroad tank car into any stationary storage tank or mobile fueler, and from any stationary storage tank or mobile fueler into any mobile fueler or motor vehicle fuel tank	This rule applies to any tank with a capacity of $\geq 1,100$ gallons in which any organic liquid is placed, held, or stored	This rule applies to any gasoline storage and dispensing operation or mobile fueler from which gasoline is transferred into motor vehicle fuel tanks, except as provided in Section 4.0 of the rule
Phase I: Gasoline Transfer into Stationary Storage Tanks and	Underground storage tanks: 1) are equipped with a “CARB certified” enhanced vapor recovery	The Tank is equipped with CARB certified phase I vapor recovery system for mobile fuelers	Stationary storage tank or mobile fueler tank is equipped with a CARB certified vapor	The tank is equipped with a CARB certified vapor recovery system capable of recovering or	Containers used for aviation gasoline are equipped with a Phase I vapor recovery	From SJVAPCD Rule 4621: Containers used for aviation gasoline must be equipped

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
Mobile Fuelers	system having a minimum volumetric efficiency of 98% and an emission factor not exceeding 0.15 lb/1,000 gallons. 2) A “CARB certified” spill box shall be installed and equipped with an integral drain valve or other devices (CARB certified) to return spilled gasoline to the underground stationary storage tank.	certified pursuant to CARB’s CP204, certification procedures for vapor recovery systems of cargo tanks	recovery system, which is maintained and operated according to the manufacturer’s specifications Underground tank lines are gravity drained, and above-ground tanks are equipped with dry breaks, or as approved by the District, such that upon line disconnect the liquid leak rate does not exceed three	processing 98% of the displaced Gasoline Vapors - The Mobile Fueler is equipped with a CARB certified vapor recovery system capable of recovering or processing 95% of the displaced gasoline vapors - Underground tank lines shall be gravity drained; in such a manner that upon disconnect no	system that is certified to meet a minimum volumetric control of 95% For an underground storage container that contains gasoline and is not located at a bulk plant, the container shall be equipped with an CARB certified Phase I vapor recovery system that is certified to have a minimum	with a Phase I vapor recovery system that is certified to meet a minimum volumetric control of 95% For an underground storage container that contains gasoline and is not located at a bulk plant, the container shall be equipped with an CARB certified Phase I vapor recovery system that is certified to

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
	Aboveground storage tanks are equipped with a “CARB certified” vapor recovery system having a minimum volumetric efficiency of 95%		drops per minute	liquid spillage would occur. Aboveground storage tanks shall be equipped with Dry Breaks, such that liquid spillage upon disconnect shall not exceed 10 milliliters	volumetric control efficiency of 98% (but 95% for aviation gasoline) All aboveground storage containers that contain gasoline shall be equipped with an CARB certified pressure vacuum relief valve set 3.0±0.5 inches water column pressure relief and 8.0±2.0 inches water	have a minimum volumetric control efficiency of 98% (but 95% for aviation gasoline) All aboveground storage containers that contain gasoline shall be equipped with an CARB certified pressure vacuum relief valve set 3.0±0.5 inches water column pressure relief and 8.0±2.0

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
					column vacuum relief All aboveground storage containers that contain aviation gasoline shall be equipped with pressure relief valves set at 8 ounces per square inch	inches water column vacuum relief All aboveground storage containers that contain aviation gasoline shall be equipped with pressure relief valves set at eight (8) ounces per square inch
Phase II – Gasoline Transfer into Vehicle Fuel Trucks*	The dispensing unit used to transfer the gasoline from the stationary storage tank to the motor vehicle fuel tank is	Each Mobile Fueler Cargo Tank, excluding one individual portable fuel container with a capacity up to 6.6 gallons of gasoline, is equipped with a	The dispensing unit is equipped with a “CARB Certified” Vapor Recovery System operated and maintained in a	The dispensing unit is equipped with a CARB Certified Vapor Recovery System capable of recovering 95 percent		Gasoline dispensing unit used to transfer the gasoline is equipped with and has in operation an CARB certified Phase II vapor

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
	equipped with a “CARB certified” vapor recovery system as capable of recovering or processing displaced gasoline vapors by at least 95%, or having an emission factor not exceeding 0.38 pounds per 1,000 gallons, as applicable; • All liquid removal devices installed for any gasoline dispensing	CARB Certified Phase II Vapor Recovery System certified pursuant to CARB’s CP-205, Certification Procedure for Vapor Recovery Systems of Novel Facilities, using TP-205.2, Test Procedure for Determination of Efficiency of Phase II Vapor Recovery of Novel Facilities, to be capable of recovering or processing displaced Gasoline Vapors by at least 95%, or having an	Vapor-tight and Liquid-tight manner in accordance with the manufacturer’s specifications and the applicable CARB certification • All Liquid Removal Devices installed for any Gasoline dispensing nozzle with a dispensing rate of greater than five gallons per minute shall be “CARB Certified” with	(95%) of the displaced Gasoline Vapors, or having an emission factor not exceeding 0.38 pounds per 1,000 gallons • All Liquid Removal devices installed for any Gasoline dispensing nozzle with a dispensing rate of greater than five gallons per minute shall be CARB Certified with a minimum		recovery system

Rule Element	South Coast AQMD Rule 461 – Gasoline Transfer and Dispensing (Amended 1/7/22)	South Coast AQMD Rule 461.1 – Gasoline Transfer and Dispensing for Mobile Fueling Operations (Adopted 1/7/22)	AVAQMD 461 – Gasoline Transfer and Dispensing (Amended 10/21/08)	MDAQMD 461 – Gasoline Transfer and Dispensing (Amended 1/22/18)	SJVAPCD Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants (Amended 12/19/13)	SJVAPCD Rule 4622 – Gasoline Transfer into Motor Vehicle Fuel Tanks (Amended 12/19/13)
	nozzle with a dispensing rate of greater than five gallons per minute shall be “CARB certified” with a minimum liquid removal rate of five milliliters per gallon transferred	emission factor not exceeding 0.38 pounds per 1,000 gallons, as applicable	a minimum liquid removal rate of five milliliters per gallon transferred	Liquid Removal rate of five milliliters per gallon transferred		

**TABLE 4-61
COMPARISON OF SOUTH COAST AQMD RULE 462 WITH RULES AT OTHER AGENCIES**

Rule Element	South Coast AQMD Rule 462 – Organic Liquid Loading (Amended 5/14/99)	AVAQMD Rule 462 – Organic Liquid Loading (Amended 9/19/17)	BAAQMD Rule 8-33 – Gasoline Bulk Terminals and Gasoline Cargo Tanks (Amended 11/3/21)	MDAQMD Rule 462 – Organic Liquid Loading (Amended 1/22/18)
Applicability	Facilities that load organic liquids with a vapor pressure of 1.5 psia (77.5 mmHg) or greater under actual loading conditions into any tank truck, trailer, or railroad tank car. The provisions of this rule shall apply to all the organic liquid loading facilities that are defined as Class A, B or C facilities	Same as South Coast AQMD Rule 462	To limit emissions of organic compounds associated with gasoline transfer operations at gasoline bulk terminals and organic compounds from gasoline cargo tanks	To control emissions of VOC and toxic compounds from facilities that transport and load organic liquids into tanks, including Motor Vehicle fuel tanks, tank trucks, trailers or railroad tank cars. (2) Applicability: (a) The provisions of this rule shall apply to all Class “A” or “B” Facilities, Retail and non-retail service stations or any other facility where Organic Liquids are stored or transferred
Class Definition	- Class "A" Facility – Any facility which loads 20,000 gallons (75,700 liters) or more on any one day of organic liquids into any tank truck, trailer, or railroad tank car - Class "B" Facility – Any facility: 1) which was constructed before January 9, 1976 and	Same as South Coast AQMD Rule 462	N/A	Class “A” Facility – Any Organic Liquid Loading Facility loading 5,000,000 gallons (18,925,000 liters) or more per year and/or 20,000 gallons (73,700 liters) or more on any day of Organic Liquids with a True Vapor Pressure, determined at actual storage conditions, of 77.5

Rule Element	South Coast AQMD Rule 462 – Organic Liquid Loading (Amended 5/14/99)	AVAQMD Rule 462 – Organic Liquid Loading (Amended 9/19/17)	BAAQMD Rule 8-33 – Gasoline Bulk Terminals and Gasoline Cargo Tanks (Amended 11/3/21)	MDAQMD Rule 462 – Organic Liquid Loading (Amended 1/22/18)
	loads more than 4,000 gallons (15,140 liters) but not more than 20,000 gallons (75,700 liters) of gasoline on any one day; Or loads not more than 4,000 gallons of gasoline on any one day, but more than 500,000 gallons of gasoline in any one calendar year, into any tank truck, trailer, or railroad tank car 2) which was constructed after January 9, 1976 and loads not more than 20,000 gallons (75,700 liters) of gasoline on any one day into a tank truck, trailer or railroad tank car Class "C" Facility- Any facility existing before January 9, 1976 which loads not more than 4,000 gallons (15,140 liters) of gasoline on any one day and not more than 500,000 gallons in any one calendar year, into any tank truck, trailer, or railroad tank car			mmHg (1.5 psia) or greater into any tank truck, trailer, or railroad tank car Class "B" Facility – Any Organic Liquid Loading Facility loading less than 5,000,000 gallons (18,925,000 liters) per year. with a True Vapor Pressure, determined at actual storage conditions, of 77.5 mmHg (1.5 psia) or greater into any tank truck, trailer, or railroad tank car

Rule Element	South Coast AQMD Rule 462 – Organic Liquid Loading (Amended 5/14/99)	AVAQMD Rule 462 – Organic Liquid Loading (Amended 9/19/17)	BAAQMD Rule 8-33 – Gasoline Bulk Terminals and Gasoline Cargo Tanks (Amended 11/3/21)	MDAQMD Rule 462 – Organic Liquid Loading (Amended 1/22/18)
Loading Requirements	- At Class A Facilities: Each vapor recovery and/or disposal system shall reduce the emissions of VOC to ≤ 0.08 lb/1,000 gal (10 g/1,000 L) of organic liquid transferred. The backpressure in the vapor recovery and/or disposal system shall not exceed 18 inches of water column pressure - At Class B Facilities: Vapor recovery and/or disposal system shall be designed and operated to recover at least 90% of the displaced vapors. The backpressure in the vapor recovery system shall not exceed 18 inches of water column pressure	- At Class A Facilities: From June 9, 1995 until January 31, 1998, each system shall reduce the emissions of VOC to ≤ 0.29 lb/1,000 gal (35 g/1,000 L) of organic liquid transferred. Effective February 1, 1998, each system shall reduce the emissions of VOC to ≤ 0.08 lb/1,000 gal (10 g/1,000 L) of organic liquid transferred - At Class B Facilities: Vapor recovery and/or disposal system shall be designed and operated to recover at least 90% of the displaced vapors. The backpressure in the vapor recovery system shall not exceed 18 inches of water pressure	Effective 1/10/21, emissions of non-methane organic compounds from a vapor recovery system shall not exceed 0.04 lb/1,000 gal of organic liquid loaded	- At Class A Facilities: Each Vapor Recovery and/or disposal system shall reduce the emissions of VOC to ≤ 0.08 lb/1,000 gal (10 g/1,000 L) of organic liquid transferred. The backpressure in the Vapor Recovery and/or disposal system shall not exceed 18 inches of water column pressure - At Class B Facilities: Equipped with a vapor Recovery and/or disposal system with a Vapor Recovery Efficiency of 95% a. The backpressure in the Vapor Recovery and/or disposal system shall not exceed 18 inches of water column pressure - Each class B facility should be equipped with a pressure vacuum valve on the aboveground stationary storage tank with a minimum pressure valve setting of eight 8 ounces

Rule Element	South Coast AQMD Rule 462 – Organic Liquid Loading (Amended 5/14/99)	AVAQMD Rule 462 – Organic Liquid Loading (Amended 9/19/17)	BAAQMD Rule 8-33 – Gasoline Bulk Terminals and Gasoline Cargo Tanks (Amended 11/3/21)	MDAQMD Rule 462 – Organic Liquid Loading (Amended 1/22/18)
				per square inch, provided that such setting will not exceed the tank's maximum pressure rating. This requirement does not pertain to Floating Roof Tanks

c. Conclusion

Evaluation of rules for gasoline dispensing tanks revealed that South Coast AQMD's rules are generally the most stringent. Staff did not identify any potential contingency measures that can achieve quantifiable reductions within two years.

5. Miscellaneous/Other Fugitive Losses

a. Overview

Miscellaneous/Other Fugitive Losses account for 1.54 tpd of VOC and 0.02 tpd of NO_x emissions in 2037. The emissions inventory does not provide sufficient detail to elucidate the specific processes contributing emissions. As such, multiple South Coast AQMD rules may apply to this source category, including Rules 461, 461.1, 462, 463, 464, 465, 466, 466.1, 467, 1123, 1149, 1173, 1176, 1177, 1178, 1180, 1180.1, and 1189.

b. Evaluation

Several rules have already been evaluated under different source categories in this document. For example, Rules 1173 and 1176 are evaluated under the Refining Process Fugitive Losses category; Rules 463 and 1178 are evaluated under the Storage Tanks and Related Losses category; Rules 1149 and 1177 are evaluated under Gas Transmission and Dispensing Losses category; and Rules 461, 461.1, and 462 are evaluated under the Fuel Transfer and Dispensing Losses category. The remaining rules are briefly summarized in Table 4-62.

TABLE 4-62
SUMMARY OF SOUTH COAST AQMD RULES 464, 465, 466, 466.1, 467, 1123, AND 1189

Rule	Key Requirements
Rule 464 – Wastewater Separators (Amended 12/7/90)	- Vessels and devices used to recover oil or tar from effluent water must be equipped with: - a solid cover with all openings sealed and totally enclosing the liquid contents of the compartment; or - a floating pontoon or double-deck type cover with no seal gaps greater than 1/8 inch for an accumulative length of 97 percent of the perimeter of the compartment and no gap exceeding ½ inch. - Gauging and sampling devices as well as forebays must be covered
Rule 465 – Refinery Vacuum-Producing Devices or Systems (Amended 8/13/99)	- Hot wells and accumulators shall be equipped with covers - Exhaust gases from vacuum-producing devices or systems, including hot wells and accumulators, shall be continuously collected and added to a fuel gas system or combustion device
Rule 466 – Pumps and Compressors (Amended 10/7/83)	- Pumps and compressors must be equipped with seals such that none of the below conditions exist: - Leakage of more than three drops per minute

Rule	Key Requirements
	○ Visible mist ○ Visible indication of leakage ● Pumps and compressors found to leak VOC in excess of 10,000 ppm must be repaired
Rule 466.1 – Valves and Flanges (Amended 3/16/84)	● No leakage of greater than three drops per minute or a visible mist ● Valves and flanges with a VOC concentration of 10,000 ppm measured 1 centimeter from the source must be repaired and regularly inspected
Rule 467 – Pressure Relief Devices (Amended 3/5/82)	● PRDs at refineries and chemical plants must be vented to a vapor recovery system or inspected and maintained ● PRDs must be inspected regularly and, if a leak is identified, repaired within 15 days or at the next scheduled turnaround if the PRD cannot be isolated without shutting down the process unit
Rule 1123 – Refinery Process Turnarounds (Amended 12/7/90)	Vessels containing VOC cannot be depressurized unless the vapors are collected and contained for use as fuel or sent to a gas disposal system until the pressure in the vessel is below five pounds per square inch, gauge, or is within ten percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower
Rule 1180 – Fenceline and Community Air Monitoring for Petroleum Refineries and Related Facilities (Amended 1/5/24)	● Conduct fenceline monitoring at refineries and related facilities for various pollutants including NO_x, VOC, and Toxic Air Contaminants and make the data available through a web-based interface ● Initiate a Specific Cause Analysis when pollutants are measured above specified thresholds. If the cause is determined to be from an on-site source, initiate corrective action to stop the exceedance within 24 hours
Rule 1180.1 – Fenceline and Community Air Monitoring for Other Refineries (Adopted 1/5/24)	● Conduct fenceline monitoring at smaller refineries for various pollutants including NO_x, VOC, and Toxic Air Contaminants and make the data available through a web-based interface ● Initiate a Specific Cause Analysis when pollutants are measured above specified thresholds. If the cause is determined to be from an on-site source, initiate corrective action to stop the exceedance within 24 hours
Rule 1189 – Emission from Hydrogen Plant Process Vents (Adopted 1/21/00)	● All hydrogen process plants must limit total VOC emissions from all process vents combined to 2.5 pounds of VOC per million standard cubic feet of hydrogen produced ● New or reconstructed plants are required to comply with an emission limit for all process vents combined of 0.5 pounds of VOC per million standard cubic feet of hydrogen produced

Many of the Regulation IV rules were amended decades ago and have been superseded by source-specific rules with more stringent requirements. For example, Rules 466, 466.1, and 467 were superseded by Rule

1173, which applies to more components at a larger universe of facilities.⁵⁶ Similarly, Rule 464 was supplanted by the more stringent Rule 1176. As previously mentioned, Rules 1173 and 1176 are evaluated elsewhere in this document. Therefore, staff did not evaluate many of the Regulation IV rules as the source-specific rules have already been demonstrated to have the most stringent requirements.

However, Rule 465 contains no analogous source-specific rule and it is therefore evaluated in this section. The purpose of Rule 465 is to control VOC emissions from petroleum refinery vacuum producing devices or systems, including hot wells and accumulators. Rule 465 is compared with SJVAPCD Rule 4453, VCAPCD Rules 67 and 74.8, and BAAQMD Rule 8-9 in Table 4-63. Other agencies' rules require that hot wells and accumulators must be closed with covers and that VOC vapors from vacuum producing devices must be controlled and piped to a combustion device with at least 90 percent control efficiency. The venting of VOC vapors from vacuum producing devices to the fuel gas system prior to incineration reflect the industry's existing practices. South Coast AQMD-approved combustion devices such as heaters or furnaces used at refineries achieve a VOC emission control efficiency greater than 90 percent. Therefore, Rule 465 is at least as stringent as analogous rules at other agencies.

⁵⁶ South Coast AQMD, Proposed Amended Rule 1173 Final Staff Report, p. 1-4.
<http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-Nov1-022.pdf?sfvrsn=6>

TABLE 4-63
SOUTH COAST AQMD RULE 465 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 465 – Refinery Vacuum-Producing Devices or Systems (Amended 8/13/99)	BAAQMD Rule 8-9 – Vacuum Producing Systems (Amended 11/3/21)	VCAPCD Rule 67 – Vacuum Producing Devices (Amended 7/5/83) and Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separators and Process Turnarounds (Amended 7/5/83)	SJVAPCD Rule 4453 – Refinery Vacuum Producing Devices or Systems (Amended 12/17/92)
Applicability	All VOC emissions and sulfur compound emissions from any petroleum refinery vacuum-producing devices or systems, including hot wells and accumulator	Vacuum producing systems include, but are not limited to, steam ejectors with contact (barometric) condensers, steam ejectors with surface condensers, and mechanical vacuum pumps	Any vacuum producing devices or systems including hot wells and accumulators	Any vacuum producing device or system, including hot wells and accumulators installed in a refinery operation
Requirements	- Hot wells and accumulators shall be equipped with covers - Exhaust gases from vacuum-producing devices or systems, including hot wells and accumulators, shall be continuously collected and added to a fuel gas system or combustion device	- Non-Condensable precursor organic emissions from vacuum producing systems must either be controlled and piped to an appropriate firebox or incinerator for combustion, or be collected, compressed, and added to the fuel gas system, or be contained and treated so as to prevent their emission into the atmosphere - Hot wells and/or accumulators associated	<u>Rule 67</u> A person shall not discharge into the atmosphere more than 3 pounds of reactive organic compounds (ROC) in any one hour from any vacuum producing devices or systems including hot wells and accumulators, unless said discharge has been reduced by at least 90% <u>Rule 74.8</u> A person shall not use any vacuum producing system at a petroleum refinery	- Hot wells and accumulators shall be covered - Vapors shall be: - Collected, compressed, and added to refinery gas - Controlled and combusted in an appropriate firebox or incinerator with at least 90% VOC control efficiency

Rule Element	South Coast AQMD Rule 465 – Refinery Vacuum- Producing Devices or Systems (Amended 8/13/99)	BAAQMD Rule 8-9 – Vacuum Producing Systems (Amended 11/3/21)	VCAPCD Rule 67 – Vacuum Producing Devices (Amended 7/5/83) and Rule 74.8 – Refinery Vacuum Producing Systems, Wastewater Separators and Process Turnarounds (Amended 7/5/83)	SJVAPCD Rule 4453 – Refinery Vacuum Producing Devices or Systems (Amended 12/17/92)
		with vacuum system condensers must be covered and the precursor organic vapors must either be incinerated or contained and treated so as to prevent their emission into the atmosphere	for handling ROCs unless all ROCs are prevented from entering the atmosphere • Pipe all uncondensed ROC vapors to a firebox, a flare, or adding said vapors to refinery fuel gas or feedstock; or • Control uncondensed ROC vapors by approved method	

The sections below evaluate the remaining source-specific rules applicable to the Miscellaneous/Other Fugitive Losses category.

Refinery Process Turnarounds

Rule 1123 applies to vessels at refineries in which materials are processed or treated. It reduces VOC emissions by requiring that the vapors be captured when the vessel is depressurized during process turnarounds. Comparable rules in other districts include BAAQMD Rule 8-10 and SJVAPCD Rule 4454. Table 4-64 summarizes the comparison of applicable requirements in each rule.

TABLE 4-64
SOUTH COAST AQMD RULE 1123 COMPARATIVE ANALYSIS

	South Coast AQMD Rule 1123 – Refinery Process Turnarounds (Amended 12/7/90)	BAAQMD Rule 8-10 – Process Vessel Depressurization (Amended 11/3/21)	SJVAPCD Rule 4454 – Refinery Process Unit Turnaround (Amended 12/17/92)
Applicability	Any container or structural envelope at a refinery in which materials are processed or treated	Process vessels at refineries and chemical plants	Any refinery vessel containing VOC
Exemptions	None	- Vessels subject to Rules 8-5, 8-24, 8-35, 8-36, 8-41, 8-50, and 8-52 - Any process vessel with a volume of less than 100 cubic feet - Any process vessel used in a batch process operation that requires periodic vessel opening as part of routine operation of the vessel, including but not limited to delayed coking vessels	Process vessels that have been depressurized to less than 5 psig
Operating Requirements	Process vessels cannot depressurize any vessel containing VOC unless the vapors are collected and contained for use as fuel or sent to a gas disposal system until the pressure in the	- Process vessels cannot be vented to the atmosphere unless: - Total organic compounds have been reduced to less than 10,000 ppm, expressed as methane; or	- All process vessels shall be depressurized to less than 5 psig before venting/opening to atmosphere - VOC released during depressurization must be:

	South Coast AQMD Rule 1123 – Refinery Process Turnarounds (Amended 12/7/90)	BAAQMD Rule 8-10 – Process Vessel Depressurization (Amended 11/3/21)	SJVAPCD Rule 4454 – Refinery Process Unit Turnaround (Amended 12/17/92)
	vessel is below 5 psig, or is within ten percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower	- The total number of vessels vented above 10,000 ppm during any consecutive five-year period does not exceed 10% of the total process vessel population, and the organic compound emissions from the opening of these vessels shall not exceed 15 pounds per day - Emissions of VOC from depressurizing any process vessel at a refinery or a chemical plant shall be controlled by venting them to a fuel gas system, firebox, incinerator, thermal oxidizer, flare, or otherwise preventing their emissions to the atmosphere until the pressure is less than 4.6 psig	- Recovered; or - Controlled or incinerated for combustion; or - Flared

The requirements in other districts' rules are generally similar to those in Rule 1123. However, BAAQMD Rule 8-10 has additional provisions that address methane concentrations in process vessels. While these measures reduce methane emissions, it is uncertain whether they would result in greater reductions in VOC emissions than those achieved under Rule 1123. Therefore, staff concludes that Rule 1123 is as stringent as other districts' rules.

Fenceline Monitoring

Both Rules 1180 and 1180.1 require the measurement of ambient concentrations of NO_x, VOC, and toxic air contaminants at or near the boundaries of refineries by establishing real-time fenceline air monitoring systems. Importantly, these rules require the operator to initiate a Specific Cause Analysis if NO_x or VOC

are detected above specified thresholds. If the exceedance is attributable to an on-site source, the corrective actions that the operator takes to eliminate the exceedance result in emission reductions.

Staff reviewed similar rules in other districts, including BAAQMD Rule 12-15 and SJVAPCD Rule 4460, both of which require fenceline monitoring at refineries. Unlike Rules 1180 and 1180.1, BAAQMD Rule 12-15 does not specify pollutant thresholds or require operators to investigate the sources of high pollutant levels. In contrast, SJVAPCD Rule 4460 shares more similarities with Rules 1180 and 1180.1, though it only mandates refinery operators to submit a written report on exceedances and outline corrective actions taken. This is in contrast to Rules 1180 and 1180.1, which require operators to conduct repairs if the exceedance is linked to an on-site source. Additionally, unlike Rules 1180 and 1180.1, SJVAPCD Rule 4460 does not require monitoring of total VOC and NOx. Based on these differences, staff concludes that Rules 1180 and 1180.1 establish the most stringent fenceline monitoring requirements for refineries.

Hydrogen Plants

South Coast AQMD Rule 1189 applies to hydrogen plants. Hydrogen plants may also be subject to other South Coast AQMD rules (e.g. Rule 1109.1, Rule 1180, etc.) which are evaluated elsewhere in this document. The evaluation in this section is specifically focused on VOC emissions from process vents at hydrogen plants.

Staff compared the requirements of Rule 1189 with BAAQMD Rule 13-5. Table 4-65 summarizes the comparison of applicable requirements in each rule.

TABLE 4-65
SOUTH COAST AQMD RULE 1189 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1189 – Emission from Hydrogen Plant Process Vents (Adopted 1/21/00)	BAAQMD Rule 13-5 – Industrial Hydrogen Plants (Adopted 5/4/22)
Applicability	All hydrogen plants that produce any hydrogen for use in petroleum refining operations	Industrial hydrogen plants including third parties
Exemptions	None	- Specific operations of methane and/or organic compound emissions already subject to methane and/or organic compound emission requirements in Regulation 8 - Deaerator vents and carbon dioxide scrubbing vents - Industrial hydrogen plants that have a maximum design production capacity that is less than 20 tons of hydrogen per day
Equipment and	All hydrogen process plants must limit total VOC emissions from all process	Individual vents must comply with an emission limit of 15 pounds/day

Rule Element	South Coast AQMD Rule 1189 – Emission from Hydrogen Plant Process Vents (Adopted 1/21/00)	BAAQMD Rule 13-5 – Industrial Hydrogen Plants (Adopted 5/4/22)
Operating Requirements	vents combined to 2.5 pounds of VOC per million standard cubic feet of hydrogen produced or 0.5 pounds of VOC per million standard cubic feet of hydrogen produced if the plant received a construction permit after January 21, 2001	and 300 ppm total organic carbon compounds; or Baseline methane emissions for the plant must be reduced by 90 percent

There are differences between the rule structures that make direct comparison difficult. The primary intent of BAAQMD Rule 13-5 is to reduce methane emissions and, as such, the limits are expressed as total organic compounds rather than VOC. In addition, Rule 13-5 imposes explicit quantity and concentration limits, while Rule 1189 normalizes the VOC emission limits to the hydrogen throughput of the plant. Although the limits are expressed differently, Rule 1189 likely achieves an equivalent level of control compared to BAAQMD Rule 13-5.

c. Conclusion

Evaluation of rules for Miscellaneous/Other Fugitive Losses category revealed that South Coast AQMD's rules are generally as stringent as other districts' rules. Staff did not identify any potential contingency measures that can achieve quantifiable reductions within two years.

6. Cargo Tanks Fugitive Losses

Cargo Tanks Fugitive Emissions account for 3.49 tpd of VOC and zero NO_x emissions in 2037. Most of the emissions in this category result from Gasoline Cargo Tanks (77 percent is related to pressure-related fugitive losses; 20 percent to product hose fugitive losses; and 3 percent to vapor hose fugitive losses). As the agency responsible for regulating Cargo Tank emissions is CARB, this source is excluded from South Coast AQMD's analysis. Infeasibility justifications for area sources under CARB's authority are presented in Appendix B.

Industrial Processes

Industrial processes account for 11.40 tpd of VOC emissions and 0.94 tpd of NO_x emissions in 2037. The source categories contributing emissions include chemical, food and agriculture, mineral processes, metal processes, wood and paper, electronics, and other industrial processes as presented in Table 4-66. These categories are individually evaluated below.

TABLE 4-66
INDUSTRIAL PROCESSES SOURCE CATEGORY EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Industry	VOC (tpd)	NOx (tpd)
410 – Chemical	4.60	0.07
420 – Food and Agriculture	0.58	0.03
430 – Mineral Processes	0.46	0.47
440 – Metal Processes	0.12	0.34
450 – Wood and Paper	0.26	0.00
460 – Glass and Related Products	0.00	0.00
470 – Electronics	0.02	0.00
499 – Other (Industrial Processes)	5.37	0.03
Total	11.40	0.94

*Totals may not sum due to rounding

1. Chemical

a. Overview

MSC 410, pertaining to chemicals within industrial processes, accounts for 4.60 tpd of VOC emissions and 0.07 tpd of NOx emissions in 2037. Table 4-67 provides a detailed breakdown of NOx and VOC emissions from this source category.

TABLE 4-67
CHEMICAL EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Source Category	VOC (tpd)	NOx (tpd)
321 – Tanks (unspecified)	0.00	0.00
322 – Floating roof tanks – breathing losses	0.00	0.00
324 – Floating roof tanks – working	0.00	0.00
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks – working losses	0.01	0.00
332 – Pressure tanks	0.00	0.00
338 – Cooling towers	0.00	0.00
340 – Wastewater treatment	0.00	0.00
390 – Tank cars and trucks – working losses	0.00	0.00
400 – Chemical manufacturing	0.02	0.03
402 – Rubber and rubber products manufacturing	0.85	0.00
403 – Fiberglass and fiberglass products manufacturing	0.48	0.00
404 – Plastics and plastic products manufacturing	2.98	0.04
407 – Paint and allied products manufacturing	0.09	0.00
436 – Storage piles	0.00	0.00
995 – Other (chemical processes)	0.17	0.00

Source Category	VOC (tpd)	NOx (tpd)
Total	4.60	0.07

Processes that contribute emissions to major source category 410 – Chemical include the manufacturing of plastic products, rubber products, chemicals, and fiberglass. Certain rules for these source categories are evaluated under Petroleum Production and Marketing due to overlap. For instance, storage tanks at chemical plants are subject to Rule 463, evaluated under Petroleum Production and Marketing - Storage Tanks and Related Losses, if the volume of the tanks is 75,000 liters or more. Meanwhile, VOC leaks at chemical plants are controlled by Rule 1173, evaluated under Petroleum Production and Marketing - Liquid and Gas/Vapor Leaks. Additionally, emissions from some chemical manufacturing facilities, including refineries, are also evaluated under Petroleum Production and Marketing.

b. Evaluation

Staff reviewed available control measures for this source category as implemented by South Coast AQMD and other state and local air agencies. Given the distinct rule structures across jurisdictions, direct comparisons can be challenging. Specifically, for controlling VOC emissions from plastic, rubber, and fiberglass manufacturing South Coast AQMD Rule 1141 (Control of Volatile Organic Compound Emissions from Resin), Rule 1162 (Polyester Resin Operations), and Rule 1163 (Control of Vinyl Chloride Emissions) were identified as applicable. For controlling VOC emissions from chemical manufacturing, Rule 1103 (Pharmaceutical and Cosmetic Manufacturing Operations) and Rule 1141.2 (Surfactant Manufacturing) were deemed applicable. Finally, paint and allied products manufacturing is regulated by Rule 1141.1 (Coatings and Ink Manufacturing). These categories are evaluated individually below.

i. Plastic, rubber, and fiberglass manufacturing

Control measures for sources in chemical industrial processes generally encompass various common strategies. In the case of VOC emissions from resin manufacturing and polyester resin operations, specific minimum VOC control efficiencies are mandated, contingent upon the resin production process employed. There are also VOC limits for the application of resin or gel coat materials onto open mold surfaces. To curtail fugitive VOC emissions resulting from VOC leaks in chemical plants, designated leak thresholds are established for different components or devices. Regular inspections and maintenance procedures are mandatory, with prompt repairs mandated upon the detection of violations, and mitigation fees may be imposed as part of enforcement. Table 4-68 provides a summary of the control measures considered for resin manufacturing.

It is important to note that SJVAPCD Rule 4684 (Amended 8/18/11)⁵⁷ and VCAPCD Rule 74.14 (Amended 4/12/05)⁵⁸ establish the exact same VOC limits for polyester resin operations as South Coast AQMD Rule

⁵⁷ SJVAPCD Rule 4684 – Polyester Resin Operations, Amended August 18, 2011.

<https://ww2.valleyair.org/media/ob5bqzxc/rule-4684.pdf>

⁵⁸ VCAPCD Rule 74.14 – Polyester Resin Material Operations, Revised April 12, 2005.

<http://www.vcapcd.org/Rulebook/Reg4/RULE%2074.14.pdf>

1162. As these rules align with South Coast AQMD Rule 1162, they have been omitted from Table 4-68 for brevity.

South Coast AQMD Rule 1141 requires a more stringent overall VOC control efficiency (98 percent) compared to BAAQMD rules (95 percent). South Coast AQMD Rule 1162 includes a total of 14 source category VOC content limits ranging from 10 to 48 percent by weight for polyester resin operations. These limits are comparable to or more stringent than rules from other agencies or national standards. While U.S. EPA emission standard 40 CFR 63 Subpart VVVV and MDAQMD Rule 1162 have specific VOC limits for fiberglass boat manufacturing operations, South Coast AQMD Rule 1162 does not exempt these operations and therefore, they are subject to the general requirements in the rule. In summary, Rule 1141 and Rule 1162 are generally as stringent as other agencies' rules.

TABLE 4-68
CONTROL MEASURES IMPLEMENTED BY SOUTH COAST AQMD AND OTHER DISTRICTS FOR RESIN MANUFACTURING

	South Coast AQMD Rule 1141 – Control of Volatile Organic Compound Emissions from Resin Manufacturing (Amended 11/17/00) and Rule 1162 Polyester Resin Operations (Amended 7/8/05)	BAAQMD Rule 8-36 – Resin Manufacturing (Adopted 6/6/84)	MDAQMD Rule 1162 – Polyester Resin Operations (Amended 4/23/18)	U.S. EPA 40 CFR 63 Subpart VVVV – National Emission Standard for Hazardous Air Pollutants for Boat Manufacturing (Amended 3/20/20)	SMAQMD Rule 465 – Polyester Resin Operations (Amended 9/25/08)
Applicability	Applies to resin manufacturing and polyester resin manufacturing which emit VOC	Emissions of precursor organic compounds from resin manufacturing operations	Applies to manufacture of products from, or the use of, Polyester Resin Material	Establishes national emission standards for hazardous air pollutants (HAP) for new and existing boat manufacturing facilities that are major sources of HAPs	Applies to polyester resin operations which emit VOC within Sacramento County
Control Measure/Emission Limits	An operator shall not manufacture organic resin: - Unless VOC from the reactor, thinning tank and blending tank vents are reduced: - to 0.5 pound per 1,000 pounds of completed resin produced, or - by 95% or more - By a continuous polystyrene process unless VOC from vacuum devolatilizer systems and styrene recovery systems are reduced to 0.12 pound per 1,000 pounds of completed resin produced - By a liquid-phase high-density polyethylene slurry process unless VOC from reactor, recycle treaters,	Total VOC emissions to the atmosphere from the resin reactor, thinning tank and blending tank are abated by 95% or more VOC emissions from all resin reactors, thinning tanks and blending tanks do not exceed 10 lb per day	Tooling Resin Atomized (spray) is 30% weight average monomer limits the weighted average monomer VOC content for fiberglass boat manufacturing operations	VOC limits for 7 source categories: Pigmented Gel Coat Operations is 33%; Tooling Resin Operations is 30–39%; Tooling Gel Coat Operations is 40%; Clear Gel Coat Operations is 48%; Production Resin Operations is 28-35%.	Resins, less than 35% by weight average monomer VOC content limits by weight: Pigmented gel coats is 45%; Specialty resins and clear gel coats is 50%

	South Coast AQMD Rule 1141 – Control of Volatile Organic Compound Emissions from Resin Manufacturing (Amended 11/17/00) and Rule 1162 Polyester Resin Operations (Amended 7/8/05)	BAAQMD Rule 8-36 – Resin Manufacturing (Adopted 6/6/84)	MDAQMD Rule 1162 – Polyester Resin Operations (Amended 4/23/18)	U.S. EPA 40 CFR 63 Subpart VVVV – National Emission Standard for Hazardous Air Pollutants for Boat Manufacturing (Amended 3/20/20)	SMAQMD Rule 465 – Polyester Resin Operations (Amended 9/25/08)
	thinning tank, blending tank and product finishing section are reduced by 98% or more - By a liquid-phase polypropylene process VOC from reactor, slurry vacuum filter system, diluent recovery section, and product finishing section vents are reduced by 98% or more VOC limits (monomer content) from 10-48% by weight or alternatively 90% control efficiency for add-on control. Various requirements when applying resin or gel coat materials to open mold surface. Monomer (VOC) content limits from 10 to 48% by weight for 14 source categories: - Clear gel coat: 40–44% - Pigmented gel coat: 28–37% - Specialty gel coats: 48% - General purpose resins: 10–17% - Others polyester resins: 35%				

Vinyl chloride,⁵⁹ a colorless carcinogenic gas used in the process of making polyvinyl chloride (PVC) plastic and vinyl products, is also a VOC. In 1976, U.S. EPA finalized the national emission standard for hazardous air pollutants (NESHAP) for vinyl chloride and, in 1978, CARB established the California Ambient Air Quality Standard (CAAQS) for vinyl chloride. The standard was set at 0.010 ppm as a 24-hour average because it was the lowest level that could be reliably measured at the time the standard was promulgated.⁶⁰ However, as a carcinogen, no level of exposure to vinyl chloride is without risk. South Coast Rule 1163 – Control of Vinyl Chloride Emissions was adopted in 1985 to address the CAAQS and NESHAP and regulate plants that produce vinyl chloride by any process. Similarly, BAAQMD adopted Rule 11-6 – Vinyl Chloride in 1982.

In 1987, the California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) established a statewide program for the inventory, monitoring, and reporting of air toxics emissions from individual facilities, as well as requirements for risk assessment and public notification of potential health risks. South Coast AQMD implemented AB 2588 for Basin via the Air Toxics Program that lists and regulates toxic air contaminants (TAC),⁶¹ including vinyl chloride, and establishes a cancer unit risk factor for each TAC.

Table 4-69 summarizes the control measures for vinyl chloride. The emission limits under South Coast AQMD Rule 1163 are equivalent to U.S. EPA emission standard 40 CFR 61 Subpart F and BAAQMD Rule 11-6.

⁵⁹ Title 40, Code of Federal Regulations (CFR) Part 61 (40 CFR 61) Subpart F, <https://www.ecfr.gov/current/title-40/part-61/subpart-F>

⁶⁰ CARB Vinyl Chloride & Health webpage <https://ww2.arb.ca.gov/resources/vinyl-chloride-and-health#:~:text=As%20a%20carcinogen%2C%20no%20level,under%20CARB's%20Air%20Toxics%20Program>

⁶¹ Section 39655 of the California Health and Safety Code defines a TAC as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health

TABLE 4-69
SOUTH COAST AQMD RULE 1163 COMPARATIVE ANALYSIS

	South Coast AQMD Rule 1163 – Control of Vinyl Chloride Emissions (Adopted 6/7/85)	BAAQMD Rule 11-6 – Vinyl Chloride (Adopted 4/21/82)	U.S. EPA 40 CFR 61 Subpart F – National Emission Standard for Hazardous Air Pollutants for Vinyl Chloride (Amended 10/17/00)
Applicability	Plants which produce: - Ethylene dichloride by reaction of oxygen and hydrogen chloride with ethylene - Vinyl chloride by any process - One or more polymers containing any fraction of polymerized vinyl chloride	Control emissions of vinyl chloride into the atmosphere from plants which produce: - ethylene dichloride by reaction of oxygen - hydrogen chloride with ethylene - vinyl chloride by any process - one or more polymers containing any fraction of polymerized vinyl chloride	Establishes national emission standards for hazardous air pollutants (HAP) for Plants which produce: - Ethylene dichloride by reaction of oxygen and hydrogen chloride with ethylene - Vinyl chloride by any process - One or more polymers containing any fraction of polymerized vinyl chloride
Requirements	A person operating a designated plant shall vent the following equipment containing more than 10 ppm of vinyl chloride to air pollution control equipment: - Vents of or appurtenances venting: - Reactors - Storage tanks or surge tanks - Purification vessels or other equipment used for purification - Stripper vessels - Combination reactor-stripper vessels - Mixing, weighing or holding tanks - Monomer recovery equipment - Receiving vessel - Other equipment as required by the Executive Officer	A person shall not discharge into the atmosphere: - from an oxychlorination reactor a gas stream with a concentration of vinyl chloride > 0.20 g/kg (0.0002 lb/lb) of 100 percent ethylene dichloride produced - vinyl chloride emissions from a reactor or stripper vessel when opened shall not be > 0.02 g/kg (0.00002 lb/lb) of polyvinyl chloride product (on a dry basis) The concentration shall not exceed 10 ppm from: - equipment at an ethylene dichloride purification plant or used	A person shall not discharge into the atmosphere: - from an oxychlorination reactor a gas stream with a concentration of vinyl chloride > 0.20 g/kg (0.0002 lb/lb) of 100 percent ethylene dichloride produced - vinyl chloride emissions from a reactor or stripper vessel when opened shall not be > 0.02 g/kg (0.00002 lb/lb) of polyvinyl chloride product (on a dry basis) The concentration shall not exceed 10 ppm from: - equipment at an ethylene dichloride purification plant or used

	South Coast AQMD Rule 1163 – Control of Vinyl Chloride Emissions (Adopted 6/7/85)	BAAQMD Rule 11-6 – Vinyl Chloride (Adopted 4/21/82)	U.S. EPA 40 CFR 61 Subpart F – National Emission Standard for Hazardous Air Pollutants for Vinyl Chloride (Amended 10/17/00)
	An operation shall not allow the discharge of concentrations equal to or greater than 10 ppb, measured at any point beyond the property line Limit the total amount of vinyl chloride in the discharge of all control equipment at less than 50 grams per hour for polyvinyl chloride plants, ethylene dichloride, and vinyl chloride plants All vent valves or relief devices (except emergency relief valves) on equipment upstream of the stripping operation or post catalysis shall be vented to a receiving vessel Product from reactors which cannot be used in subsequent operations, such as stripping, blending or drying, shall be discharged to a sealed container and vented to a receiving vessel Reactors and other equipment upstream from the stripper shall be equipped with automatic pressure reduction systems which will open at a pressure between operating pressure and the emergency pressure relief valve setting, directed to a	in vinyl chloride formation or purification - any reactor at a polyvinyl chloride plant - from each mixing, weighing or holding container in vinyl chloride service which precedes the stripper (or reactor if the plant has no stripper) - a monomer recovery system - a polyvinyl chloride stripper - slip gauges ducted through a control device during loading or unloading - reciprocating pumps and compressors that are sealless or double mechanical seals - any leak from agitators - manual venting of gases - in each in-process wastewater stream Miscellaneous Sources Following a Polyvinyl Chloride Stripper shall not exceed: - Polyvinyl chloride dispersion resins excluding latex resins <2,000 ppm - All other polyvinyl chloride resins, including latex resins, averaged separately for each type of resin <4,000 ppm	in vinyl chloride formation or purification - any reactor at a polyvinyl chloride plant - from each mixing, weighing or holding container in vinyl chloride service which precedes the stripper (or reactor if the plant has no stripper) - a monomer recovery system - a polyvinyl chloride stripper - slip gauges ducted through a control device during loading or unloading - reciprocating pumps and compressors that are sealless or double mechanical seals - any leak from agitators - manual venting of gases - in each in-process wastewater stream Miscellaneous Sources Following a Polyvinyl Chloride Stripper shall not exceed: 2,000 ppm for polyvinyl chloride dispersion resins excluding latex resins 400 ppm for all other polyvinyl chloride resins, including latex resins, averaged separately for each type of resin

	South Coast AQMD Rule 1163 – Control of Vinyl Chloride Emissions (Adopted 6/7/85)	BAAQMD Rule 11-6 – Vinyl Chloride (Adopted 4/21/82)	U.S. EPA 40 CFR 61 Subpart F – National Emission Standard for Hazardous Air Pollutants for Vinyl Chloride (Amended 10/17/00)
	receiving vessel, vapor recovery system, or air pollution control system Any detected leaks by the operator shall be eliminated within 24 hours of detection.	Polyvinyl chloride plants controlling vinyl chloride emissions with technology other than stripping, shall not exceed: • Dispersion polyvinyl chloride resins excluding latex resins <2 g/kg (0.002 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used) • All other polyvinyl chloride resins, including latex resins <0.4 g/kg (0.0004 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used) Before opening of the equipment, the quantity of vinyl chloride in the equipment shall not contain more than 2.0% by volume vinyl chloride or 0.0950 m³ (25 gal) of vinyl chloride, whichever is larger.	Polyvinyl chloride plants controlling vinyl chloride emissions with technology other than stripping, shall not exceed: • 2 g/kg (0.002 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used) for dispersion polyvinyl chloride resins excluding latex resins • 0.4 g/kg (0.0004 lb/lb) of dry solid product from the stripper (or reactor if no stripper is used) for all other polyvinyl chloride resins, including latex resins Before opening of the equipment, the quantity of vinyl chloride in the equipment shall not contain more than 2.0% by volume vinyl chloride or 0.0950 m³ (25 gal) of vinyl chloride, whichever is larger.

ii. Chemical manufacturing

South Coast AQMD Rule 1103 reduces VOC emissions from pharmaceuticals and cosmetic manufacturing operations and is compared to rules at other agencies in Table 4-70. Rule 1103 is as stringent as other agencies' applicable rules.

TABLE 4-70
SOUTH COAST AQMD RULE 1103 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1103 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 3/12/99)	SDAPCD Rule 67.15 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 5/15/96)	CAQCC Regulation Number 25 – Control of Emissions from Surface Coating, Solvents, Asphalt, Graphic Arts and Printing, and Pharmaceuticals (Adopted 12/20/24)	BAAQMD Rule 8-24 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 6/15/94)
Applicability	To reduce VOC emissions from (1) the manufacture of pharmaceutical and cosmetic products by chemical processes; (2) the production and separation of medicinal chemicals such as antibiotics and vitamins from microorganisms; (3) the manufacture of botanical and biological products by the extraction of organic chemicals from vegetable materials or animal tissues; and (4) the formulation of pharmaceuticals into various dosage forms such as tablets, capsules, injectable solutions or ointments, that can be taken by the patient immediately and in an accurate amount; and the	(1) Manufactures pharmaceutical or cosmetic products; (2) Formulates ointments or cosmetics into configurations intended for sale and/or use; (3) Produces and/or separates medicinal chemicals such as antibiotics and vitamins from micro-organisms; (4) Manufactures botanical and/or biological products by the extraction of organic chemicals from vegetative materials or animal tissues; or (5) Formulates pharmaceutical products into various dosage forms such as tablets, capsules	All sources of volatile organic compounds associated with pharmaceutical manufacturing activities, including, but not limited to, reactors, distillation units, dryers, storage of VOC, extraction equipment, filters, crystallizers, and centrifuges	To limit emissions of organic compounds from the manufacture of pharmaceutical and cosmetic products or devices

Rule Element	South Coast AQMD Rule 1103 – Pharmaceuticals and Cosmetic Manufacturing Operations (Amended 3/12/99)	SDAPCD Rule 67.15 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 5/15/96)	CAQCC Regulation Number 25 – Control of Emissions from Surface Coating, Solvents, Asphalt, Graphic Arts and Printing, and Pharmaceuticals (Adopted 12/20/24)	BAAQMD Rule 8-24 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 6/15/94)																																																		
	formulation of cosmetics into configurations intended for consumer use.	or injectable solutions that can be taken by a patient immediately and in an accurate amount																																																				
Requirements	Shall not use reactors, distillation columns, crystallizers, or centrifuges emitting more than 15 lb/day of VOC for each unit unless the vents are equipped with surface condensers or equivalent control devices as specified: <table><tr><th>VOC Total Vapor Pressure (psi) at 20°C</th><th>Max. condenser outlet gas Temp.</th></tr><tr><td>0.5 – 1.0</td><td>25°C</td></tr><tr><td>1.0 – 1.5</td><td>10°C</td></tr><tr><td>1.5 – 2.9</td><td>0°C</td></tr><tr><td>2.9 – 5.8</td><td>-15°C</td></tr><tr><td>>5.8</td><td>-25°C</td></tr></table>	VOC Total Vapor Pressure (psi) at 20°C	Max. condenser outlet gas Temp.	0.5 – 1.0	25°C	1.0 – 1.5	10°C	1.5 – 2.9	0°C	2.9 – 5.8	-15°C	>5.8	-25°C	- Reactors, distillation columns, crystallizers or centrifuges emitting >15 lb/day VOC shall not be used unless all vent points are equipped with surface condensers that have outlet exhaust gas temperature: <table><tr><th>VOC Vapor Pressure (psia) at 20°C</th><th>Max. Temp. gas stream exiting condenser</th></tr><tr><td>0.5 – 1.0</td><td>25°C</td></tr><tr><td>1.0 – 1.5</td><td>10°C</td></tr><tr><td>1.5 – 2.9</td><td>0°C</td></tr><tr><td>2.9 – 5.8</td><td>-15°C</td></tr><tr><td>>5.8</td><td>-25°C</td></tr></table> - Alternative control devices with combined VOC	VOC Vapor Pressure (psia) at 20°C	Max. Temp. gas stream exiting condenser	0.5 – 1.0	25°C	1.0 – 1.5	10°C	1.5 – 2.9	0°C	2.9 – 5.8	-15°C	>5.8	-25°C	Control VOC emissions from each vent that has the potential to emit 15 lb/day or more from reactors, distillation operations, crystallizers, centrifuge and vacuum dryers that have outlet exhaust gas temperature: <table><tr><th>VOC True Vapor Pressure (psia) at 20°C</th><th>Max. Temp. gas stream exiting condenser</th></tr><tr><td>0 – 0.5</td><td>35°C</td></tr><tr><td>0.5 – 1.0</td><td>25°C</td></tr><tr><td>1.0 – 1.5</td><td>10°C</td></tr><tr><td>1.5 – 2.9</td><td>0°C</td></tr><tr><td>2.9 – 5.8</td><td>-15°C</td></tr><tr><td>>5.8</td><td>-25°C</td></tr></table>	VOC True Vapor Pressure (psia) at 20°C	Max. Temp. gas stream exiting condenser	0 – 0.5	35°C	0.5 – 1.0	25°C	1.0 – 1.5	10°C	1.5 – 2.9	0°C	2.9 – 5.8	-15°C	>5.8	-25°C	- Emit VOC no more than 15 lb/day from any reactor, distillation column, crystallizer or centrifuge that have outlet exhaust gas temperature: <table><tr><th>VOC Vapor Pressure (psia) at 20°C</th><th>Max. Temp. gas stream exiting condenser</th></tr><tr><td>0.5 – 1.0</td><td>25°C</td></tr><tr><td>1.0 – 1.5</td><td>10°C</td></tr><tr><td>1.5 – 2.9</td><td>0°C</td></tr><tr><td>2.9 – 5.8</td><td>-15°C</td></tr><tr><td>>5.8</td><td>-25°C</td></tr></table> - Emit no more than 33 lb/day VOC from separation operations, sterilizers, air dryers	VOC Vapor Pressure (psia) at 20°C	Max. Temp. gas stream exiting condenser	0.5 – 1.0	25°C	1.0 – 1.5	10°C	1.5 – 2.9	0°C	2.9 – 5.8	-15°C	>5.8	-25°C
VOC Total Vapor Pressure (psi) at 20°C	Max. condenser outlet gas Temp.																																																					
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Rule Element	South Coast AQMD Rule 1103 – Pharmaceuticals and Cosmetic Manufacturing Operations (Amended 3/12/99)	SDAPCD Rule 67.15 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 5/15/96)	CAQCC Regulation Number 25 – Control of Emissions from Surface Coating, Solvents, Asphalt, Graphic Arts and Printing, and Pharmaceuticals (Adopted 12/20/24)	BAAQMD Rule 8-24 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 6/15/94)
	- Operators shall not use centrifuges, rotary vacuum filters, or other devices with exposed liquid surfaces containing VOC with a vapor pressure of ≥ 0.5 psi at 20°C unless the devices have a hood or enclosure with a collection system that directs VOC emissions to a control device - Shall not use in-process tanks for material containing VOC unless an apparatus or cover which prevents VOC evaporation is provided for the tank - For production equipment that emits ≥ 330 lb/day of uncontrolled VOC, emissions shall be reduced by at least 90% by weight	collection and abatement efficiency of at least 90% - Centrifuges, rotary vacuum filters, or other devices with exposed liquid surfaces containing VOC with a vapor pressure of ≥ 0.5 psia at 68°F must use a VOC collection and abatement system that reduces emissions by at least 90% weight - Process tanks containing VOC with a vapor pressure of ≥ 0.5 psia at 20°C must be covered or sealed at all times, except during loading, unloading, or maintenance - Air dryers or production equipment emitting ≥ 33 lb/day of VOC must reduce emissions by at least 90% by weight	- Division approval is required for control equipment used to control VOC of 11 psia and above - Reduce VOC emissions from each air dryer and production equipment exhaust system: - By at least 90% by weight if emissions are ≥ 330 lb/day, or - To ≤ 33 lb/day if emissions are < 330 lb/day - A vapor balance system or equivalent control at least 90% effective in reducing emissions from truck or railcar deliveries to storage tanks with capacities $> 2,000$ gallons that store VOC with TVP > 4.1 psia at 20°C	All storage tanks that store organic liquids with a VP > 1.5 psia at 20°C shall be equipped with pressure/vacuum vents set at ± 0.03 psia

Rule Element	South Coast AQMD Rule 1103 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 3/12/99)	SDAPCD Rule 67.15 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 5/15/96)	CAQCC Regulation Number 25 – Control of Emissions from Surface Coating, Solvents, Asphalt, Graphic Arts and Printing, and Pharmaceuticals (Adopted 12/20/24)	BAAQMD Rule 8-24 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 6/15/94)
	- For production equipment that emits <330 lb/day of uncontrolled VOC, emissions shall be reduced to below 33 lb/day - Reduce VOC emissions by 90% by weight during transfers from trucks or rail cars into storage tanks of ≥2,000 gallons if the VOC vapor pressure is >4.1 psi at 20°C - Install pressure/vacuum vents set at ±0.03 psig on storage tanks that store VOC with a vapor pressure >1.5 psia at 20°C - Repair all liquid leaks within 24 hours of detecting the leak	- VOC with a vapor pressure >1.5 psia at 20°C cannot be transferred into a stationary storage tank over 2,000 gallons unless the tank has the following controls: - A submerged fill pipe discharging within 6 inches of the tank bottom - A vapor return line that transfers at least 90% of displaced VOC vapor back to the supply tank - A pressure-vacuum relief valve with settings of ±0.03 psig - Alternatively, an approved VOC emission control system with at least 90% collection and	Install pressure/vacuum conservation vents set at ±0.2 kPa on all storage tanks that store VOC with TVP >1.5 psi at 20°C	

Rule Element	South Coast AQMD Rule 1103 – Pharmaceuticals and Cosmetic Manufacturing Operations (Amended 3/12/99)	SDAPCD Rule 67.15 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 5/15/96)	CAQCC Regulation Number 25 – Control of Emissions from Surface Coating, Solvents, Asphalt, Graphic Arts and Printing, and Pharmaceuticals (Adopted 12/20/24)	BAAQMD Rule 8-24 – Pharmaceutical and Cosmetic Manufacturing Operations (Amended 6/15/94)
		abatement efficiency during transfer • Fugitive liquid leaks in equipment storing, mixing, blending or transferring VOC shall be promptly repaired • Fugitive vapor leaks from equipment storing, mixing, blending, reacting or transferring materials containing VOC shall be immediately recorded and repaired		

South Coast AQMD Rule 1141.2 – Surfactant Manufacturing aims to reduce VOC emissions from all manufacturing of surface-active agents, including detergents, wetting agents, and emulsifiers. It requires a surfactant manufacturer to reduce VOC emissions to 0.5 pounds per 1,000 pounds of surfactant produced or by at least 95 percent by weight. In addition, all ports used for inspection, taking samples, or adding ingredients must be closed when not in use. Soap manufacturing operations, facilities that only blend and package surfactants, and facilities that emit less than 5 pounds per day or less than 110 pounds per month of VOC are exempt. As there is no analogous rule in other air districts that is comparable to Rule 1141.2, no further evaluation was performed.

iii. Paint and allied products manufacturing

South Coast AQMD Rule 1141.1 – Coatings and Ink Manufacturing applies to this source category. Staff identified comparable rules in other districts including BAAQMD Rule 8-35, SJVAPCD Rule 4652, AVAQMD Rule 1141.1, and SDAPCD Rule 67.19. Upon analysis, AVAQMD and SJVAPCD's rules were determined to contain requirements that are identical to those in South Coast AQMD's rule. For brevity, those rules have been omitted from the comparative analysis presented in Table 4-71.

TABLE 4-71
COMPARISON OF SOUTH COAST AQMD RULE 1141.1 WITH RULES AT OTHER AGENCIES

Rule Element	South Coast AQMD Rule 1141.1 – Coatings and Ink Manufacturing (Amended 11/17/00)	BAAQMD Rule 8-35 – Coating, Ink and Adhesive Manufacturing (Amended 6/15/94)	SDAPCD Rule 67.19 – Coatings and Printing Inks Manufacturing Operations (Amended 5/15/96)
Applicability	Applies to coating and ink manufacturers, defined as an establishment that mixes, blends, and/or compounds paints, printing inks, varnishes, lacquers, enamels, shellacs, or sealers	Applies to manufacturers of coatings, inks, and adhesives	Any person who manufactures coatings or printing inks
Exemptions	- Coatings and/or ink manufacturers which produce less than 500 gallons of coatings and/or ink in any one day - Coatings and/or ink manufacturers which produce less than 11,000 gallons of coatings and/or ink in any one calendar month - Portable mixing vat requirements do not apply to equipment while it is being used in the production of water-based coatings and/or paste inks - Mixing vat requirements do not apply to equipment used to produce coatings in vats with a volume of 12 gallons or less.	- Mixing vat lid requirements do not apply if the emissions are vented to an emission control system with an 80% overall control efficiency - Portable and stationary vat mixing requirements do not apply to any equipment while it is being used in the production of low VOC coatings, inks or adhesives	- Mixing vats that are used exclusively for mixing water-based coatings or inks - Any stationary source where emissions of VOC from all coating and/or printing ink manufacturing operations are less than an average of 15.0 pounds (6.8 kg) per day of operation for each calendar month - Stationary tank requirements do not apply to any stationary storage tank with a capacity of less than 550 gallons - Facilities with combined uncontrolled emissions of VOC from all coating and/or ink manufacturing operations, including emissions from equipment cleaning, are less than 50 tons in each calendar year, are not required to operate an emission control system

Rule Element	South Coast AQMD Rule 1141.1 – Coatings and Ink Manufacturing (Amended 11/17/00)	BAAQMD Rule 8-35 – Coating, Ink and Adhesive Manufacturing (Amended 6/15/94)	SDAPCD Rule 67.19 – Coatings and Printing Inks Manufacturing Operations (Amended 5/15/96)
Requirements	- Stationary mixing vats must be covered except to add ingredients or take samples - Portable mixing vats must be covered such that the lid: - extends at least 1/2 inch beyond the outer rim of the vat or is attached to the rim of the vat; and - is maintained in good condition and maintains contact with the rim for at least 90 percent of the circumference of the rim of the vat; and - has a slit to allow clearance for insertion of a mixer shaft. The slit shall be covered after insertion of the mixer, except to allow safe clearance for the mixer shaft. - Portable mixing vats, stationary vats, high-speed dispersion mills, grinding mills, and roller mills must be cleaned in a way which minimizes the emissions of VOC into the atmosphere - Grinding mills must have fully enclosed screens	- Stationary and portable mixing vats must be covered such that: - Lids are maintained in good condition and maintain contact with 90 percent of the circumference of the rim of the vat; - Lids may have a slit to allow clearance for insertion of a mixer shaft. The slit shall be covered after insertion of the mixer, except to allow safe clearance for the mixer shaft. There must be no other holes, tears, or openings in the lid; and - The difference between the diameter of the mixer shaft and the diameter of the opening in the lid for the mixer shaft, shall be no greater than 5.1 cm (2 inches). - Operators must choose from one or more of the following cleaning requirements: - Cleaning materials must contain less than 200 g/L VOC - Operate closed cleaning systems that are maintained leak free, solvents must be drained from the cleaning equipment before the system is opened to the atmosphere, and solvents shall not	- Mixing vats must be covered such that the lid: - extends at least 1/2 inch beyond the outer rim of the vat or is attached to the rim of the vat for at least 90 percent of the circumference of the rim of the vat; and - is maintained in good condition with no holes, tears, or openings in the lid; and - may have a slit to allow clearance for insertion of a mixer shaft. The width of the slit shall be no more than 2 inches greater than the diameter of the mixing shaft. - Facilities with VOC emissions greater than 50 tons per year must operate an emission control system for vats with an overall control efficiency of at least 90 percent by weight - Stationary tanks must be equipped with a submerged fill pipe or an emission control device - Fugitive liquid leaks in equipment storing, mixing, blending, or transferring materials containing more than 10 percent of VOC by

Rule Element	South Coast AQMD Rule 1141.1 – Coatings and Ink Manufacturing (Amended 11/17/00)	BAAQMD Rule 8-35 – Coating, Ink and Adhesive Manufacturing (Amended 6/15/94)	SDAPCD Rule 67.19 – Coatings and Printing Inks Manufacturing Operations (Amended 5/15/96)
		be stored or disposed of in such a manner that will cause or allow evaporation into the atmosphere • Collect and vent the emissions from equipment cleaning to an approved emission control system that has an overall abatement efficiency of 80% or more on a mass basis. • Use solvents that contain greater than 200 g/L VOC provided that no more than 228 L are used per month and solvents are collected, stored, or reused • Grinding mills shall have fully enclosed screens. • A person shall not operate a stationary vat, which emits more than 6.8 kg (15 lbs.) per day of organic compounds unless all emissions from the vat have been vented to an approved emission control system that has an overall abatement efficiency of 80% or more on a mass basis.	weight must be repaired within 72 hours • Cleaning operations must: • Employ cleaning material that contains 200 g/L or less of VOC or has a total vapor pressure of VOC of 20 mm Hg or less at 68°F (20°C); or • Cleaning is conducted using an enclosed system; or • Cleaning material is collected in a manner to minimize emissions; or • Cleaning material must be flushed through the equipment.

BAAQMD Rule 8-35 contains some provisions which are potentially more stringent than those in South Coast AQMD Rule 1141.1. For example, Rule 8-35 does not exempt low production coating and ink manufacturers. In addition, for stationary vats, Rule 8-35 sets a VOC limit of 15 lbs/day unless the vat is equipped with an emission control system, while Rule 1141.1 contains no such requirement. Staff considered these as potential contingency measures in Rule 1141.1. However, removing the exemptions for low production facilities in Rule 1141.1 would require these facilities to make structural modifications such as installing lids on the mixing vats. Similarly, vats emitting greater than 15 lbs/day would have to install advanced emission control systems. Structural modifications as well as development and installation of control systems would require more than two years to implement. Contingency measures that do not achieve reductions within two years of being triggered are inconsistent with the guidelines specified in U.S. EPA's guidance. Therefore, staff does not propose any contingency measures.

c. Conclusion

Staff reviewed the control measures currently in place for the MSC 410 – Chemical Industrial Processes category and determined that the existing measures implemented in the Basin are as stringent as comparable rules from other agencies. No feasible contingency measures were identified.

2. Food and Agriculture

a. Overview

Major source category 420 – Food and Agriculture includes emissions from various types of processing operations including food and agricultural products processing, bakeries, breweries, and wineries. The projected 2037 baseline emissions for this category include 0.58 tpd of VOC and 0.03 tpd of NOx emissions, summarized in Table 4-72. Among the food and agriculture source categories, bakeries contribute the largest amount of VOC emissions. South Coast AQMD regulates VOC emissions in this source category through Rule 1153 – Commercial Bakery Ovens and Rule 1131 – Food Product Manufacturing.

TABLE 4-72
FOOD AND AGRICULTURE EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Source Category	VOC (tpd)	NOx (tpd)
321 – Tanks (unspecified)	0.00	0.00
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks – working losses	0.00	0.00
332 – Pressure tanks	0.00	0.00
338 – Cooling towers	0.00	0.00
408 – Wine fermentation	0.01	0.00
410 – Wine aging	0.12	0.00
412 – Bakeries	0.38	0.00
414 – Breweries	0.03	0.00
418 – Agricultural products processing losses	0.01	0.03
420 – Agricultural crop processing losses	0.02	0.00

Source Category	VOC (tpd)	NOx (tpd)
995 – Other (food and agriculture)	0.02	0.00
Total	0.58	0.03

*Totals may not sum due to rounding

b. Evaluation

Staff reviewed control measures for this source category implemented by South Coast AQMD and other state and local air agencies. Each jurisdiction has different rule structures, which can make direct comparison difficult. Table 4-73 summarizes the control measures staff considered for this source category.

TABLE 4-73
FOOD AND AGRICULTURE CONTROL MEASURES IMPLEMENTED BY SOUTH COAST AQMD AND OTHER DISTRICTS

Rule	Applicability	Control Measure
South Coast AQMD Rule 1153 – Commercial Bakery Ovens (Amended 1/13/95)	This rule controls volatile organic compound (VOC) emissions from commercial bakery ovens with a rated heat input capacity of 2 million BTU per hour or more and with an average daily emissions of 50 pounds or more of VOC	VOC emissions must be reduced at least: (A) 70% by weight (as carbon) for an oven with a base year average daily VOC emissions of 50 pounds or more, but less than 100 pounds (B) 95% by weight (as carbon) for an oven with a base year average daily VOC emissions of 100 pounds or more
South Coast AQMD Rule 1131 – Food Product Manufacturing and Processing Operations (Amended 6/6/03)	The purpose of this rule is to reduce emissions of VOC from solvents used in food product manufacturing and processing operations. This rule applies to any person using solvents in any food product manufacturing and processing operation except food supplements in tablet or capsule form. However, exemptions to the rule include: Fermentation operations in breweries, wineries, or distilleries	Reduce emissions of isopropyl alcohol and hexane from food manufacturing and processing operations such as extraction, blending, separation, crystallization, and drying. The current rule sets VOC concentration limits on both manufacturing processes and sterilization of the equipment used to manufacture and process food products, or allows the use of add-on control equipment to capture and destroy VOC emissions at a minimum of 85.5%
AVAQMD Rule 1153 – Commercial Bakery Ovens (Amended 1/13/95)	This rule controls volatile organic compound (VOC) emissions from commercial bakery ovens with a rated heat input capacity of 2 million BTU per hour or more and with an average	See requirements above for South Coast AQMD Rule 1153

Rule	Applicability	Control Measure
	daily emission of 50 pounds or more of VOC	
SJVAPCD Rule 4693 – Bakery Ovens (Adopted 5/16/02)	The requirements of this rule shall apply to bakery ovens operated at major source facilities, which emit VOC during the baking of yeast-leavened products	No person shall operate a new or existing bakery oven unless: - Emissions from all oven stacks are vented to an emission collection system, and - The collected emissions are vented to an approved emission control device, which has a control efficiency of at least 95%
SJVAPCD Rule 4694 – Wine Storage and Fermentation Tanks (Adopted 12/15/05)	This rule applies to any winery fermenting wine and/or storing wine in bulk containers equal to or greater than 5,000 gallons. Wineries with bulk containers containing over 5,000 gallons AND with baseline fermentation emissions less than 10 tons per year, and wood or concrete wine storage tanks are exempted.	- Winery Fermentation Tanks Operators shall achieve Required Annual Emissions Reductions (RAER) equal to at least 35% of the winery's Baseline Fermentation Emissions (BFE) - Storage Tanks Operators of any wine storage tank having an internal volume equal to or greater than 5,000 gallons shall: Have a pressure-vacuum relief valve meeting all of the following requirements: - The pressure-vacuum relief valve shall operate within 10% of the maximum allowable working pressure of the tank - The pressure-vacuum relief valve shall be permanently labeled with the operating pressure settings. - The pressure-vacuum relief valve and storage tank shall remain in a gas-tight condition except when the operating pressure of the tank exceeds the valve set pressure - The temperature of the stored wine shall be maintained at or below 75°F and are recorded at least once per week - For each batch of wine, operators shall achieve the storage temperature of 75°F or less within 60 days after completing fermentation

Rule	Applicability	Control Measure
SJVAPCD Rule 4695 – Brandy Aging and Wine Aging Operations (Adopted 9/17/09)	The purpose of this rule is to limit volatile organic compound (VOC) emissions from brandy aging and wine aging operations	Implement the following RACT work practices: • Prevent and minimize the unnecessary occurrence of brandy or wine exposure to the atmosphere, and leaks and spills • Immediate clean-up of leaks and spills • Preventative actions for reoccurrence of a similar brandy or wine leak or spill A Stationary Source with a wine aging operation that equals or exceeds rule applicable inventory and emission thresholds shall also comply with the RACT work practices: • Maintain the wine aging warehouse such that the daily average temperature, averaged over a calendar year, does not exceed 70°F, or • Implement a control technology to reduce the Uncontrolled Aging Emissions (UAE), as defined in the rule • With a brandy aging operation that equals or exceeds both the rule applicable inventory and emission thresholds, operator shall implement BARCT to produce a brandy with UAE of less than or equal to 0.3 proof gallons per 50 gallons • Aging wine shall be maintained at or below 75°F during aging operations
SBCAPCD Rule 802.D.2 – New Source Review – Nonattainment Review BACT Requirement (Revised 8/25/16)	Wine stored in oak barrels. Low production wineries may qualify for a written determination of exemption if the annual emissions of ethanol are less than 1 ton per year (approximately less than 25,000 barrels a year)	• Permits are required for fermentation and storage tanks, including vats, along with annual winery reporting requirements
SDAPCD Rule 67.24 – Bakery Ovens (Adopted & Effective 5/15/96)	Applicable to bakery ovens which emit VOC during the baking of yeast-	• No person shall operate a bakery oven subject to this rule, unless the

Rule	Applicability	Control Measure
	leavened products. Excludes bakery ovens: • with combined rated heat input capacity of all bakery ovens is less than 2 MMBTU/hr, • baking of unleavened products, or • uncontrolled emissions of VOC from all bakery ovens is less than 50 TPY	uncontrolled VOC emissions are reduced by at least 90% by weight
SMAQMD Rule 458 – Large Commercial Bread Bakeries (Amended 9/5/96)	Limits emission of VOC from bread ovens at large commercial bread bakeries, except for bakeries whose total VOC emissions for each and every operating day are less than 100 pounds, or bakery products leavened chemically in the absence of yeast	• All ovens shall vent emissions to an emission control system that captures emissions from all oven stacks which has a control efficiency of at least 95% on a mass basis

The control measures identified for agricultural and food processing sources rely on limiting the emissions of VOC from fermentation of yeast for both baking and fermentation operations, along with limiting emissions of VOC from other food manufacturing and processing operations.

Rule 1153 controls VOC emissions from commercial bakery ovens with a rated heat input capacity of 2 million BTU per hour or more and with average daily VOC emissions of 50 pounds or more. VOC emissions must be reduced by 70 percent by weight as carbon for an oven with base year average daily VOC emissions of 50 pounds or more, but less than 100 pounds. VOC emissions must be reduced by at least 95 percent by weight as carbon for an oven with average daily VOC emissions of 100 pounds or more. SDAPCD Rule 67.24 requires bakery ovens with average daily uncontrolled VOC emissions of 50 pounds or more to be reduced by at least 90 percent by weight, and SJVAPCD Rule 4693 requires a 95 percent VOC reduction. These rules are more stringent than South Coast AQMD Rule 1153 for facilities with ovens that emit average daily VOC emissions between 50 to 100 pounds.

Staff considered a potential contingency measure in Rule 1153 to increase the required minimum control efficiency for ovens that emit average daily VOC emissions between 50 to 100 pounds. However, the impacted facilities would need to upgrade their emission control systems to increase the VOC control efficiency from 70 to 95 percent. The development and installation of new control systems would require more than two years to implement. Contingency measures that do not achieve reductions within two years of being triggered are inconsistent with the guidelines specified in U.S. EPA's guidance. Therefore, staff does not propose a contingency measure in Rule 1153.

Rule 1131 applies to food product manufacturing and processing operations. Past emission inventory work on several District projects and other information from inspectors led to the discovery of large

amounts of solvent usage (primarily isopropyl alcohol) at several food manufacturing facilities. Food products are considered to be any combination of carbohydrates, proteins, or fats intended for human consumption. Colorings, flavorings, spices, and extracts that are manufactured and subsequently used in the preparation of human consumable foods are considered food products. Food processing and manufacturing operations include, but are not limited to distillation, extraction, reacting, blending, drying, crystallizing, granulating, separation, sterilization, and filtering. Exemptions to the rule include operations at breweries, wineries, or distilleries, and deep-fat frying operations; however, other general District rules such as Rule 201 – Permit to Construct and Rule 203 – Permit to Operate, require that units that may cause issuance of air contaminants or units used to control pollutants to be permitted. Additionally, new, relocated, or modified wineries are subject to BACT; VOC or other contaminants need to be controlled if emissions are greater than 1 pound per day. Similarly, SBCAPCD does not have winery specific rules, but require wine storage tanks under 30,000 gallons to be permitted.

Overall, staff identified two wine production/fermentation/storage/aging related VOC control measures implemented in SJVAPCD (Rule 4694 – Wine Storage and Fermentation, and Rule 4695 – Brandy Aging and Wine Aging Operations) that are not covered under South Coast AQMD rules. SJVAPCD Rule 4694 implements relief pressure valve requirements and at least 35 percent annual emissions reductions. SJVAPCD Rule 4695 implements various BMPs for storage tanks and reduces emissions by at least 50 percent. Both of these rules also require temperature of stored wine or brandy to be lower than 75°F and for Rule 4695, the daily average temperature of the wine aging warehouse, averaged over a calendar year, is maintained at or does not exceed 70°F, along with some recordkeeping requirements. There are currently no source-specific rules that apply to wine production and related operations in South Coast Air Basin.

c. Conclusion

South Coast AQMD's rules for food and agriculture are generally comparable to rules in other air districts. However, South Coast AQMD does not have any rules that directly apply to VOC emissions from wine storage tanks or wine and brandy aging. While nominal VOC emissions associated with wine fermentation and aging are present in the Basin, it is likely that wineries already implement many of the requirements of SJVAPCD Rules 4694 and 4695. For example, it is unlikely that aging is performed at temperatures exceeding 70°F as this would produce poor quality wine. For this reason, virtually all wineries employ climate-control systems. Since such measures are already being implemented in practice, no emission reductions would result from a potential contingency measure to align with SJVAPCD's rules. Therefore, no contingency measure is proposed for this source category.

3. Mineral Processes

a. Overview

Major source category 430 – Mineral Processes accounts for 0.46 tpd of VOC and 0.47 tpd of NO_x emissions in 2037. Emissions of VOC by process are shown in Table 4-74.

TABLE 4-74
MINERAL PROCESSES EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Description	VOC (tpd)	NOx (tpd)
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks – working losses	0.00	0.00
338 – Cooling towers	0.00	0.00
422 – Sand and gravel excavation and processing	0.00	0.00
424 – Asphaltic concrete production	0.21	0.03
426 – Crushed stone excavation and processing	0.00	0.00
428 – Surface blasting	0.00	0.00
429 – Cement (Portland and others) manufacturing	0.00	0.00
430 – Cement concrete manufacturing and fabrication	0.04	0.09
432 – Gypsum manufacturing	0.01	0.06
434 – Lime manufacturing	0.00	0.00
436 – Storage piles	0.00	0.00
995 – Other (mineral processes)	0.19	0.28
Total*	0.46	0.47

*Totals may not sum due to rounding.

The VOC emissions from asphaltic concrete production facilities typically originate from non-combustion sources that include storage silos, aggregate conveyors and hot elevators, and truck load-out operations. VOC emission factors for those sources at hot mix asphalt plants are discussed in the AP-42 database.⁶² These are fugitive emissions resulting from the movement of asphaltic concrete through its processing, and no control measure for such fugitive emissions was identified.

The VOC emissions in the Other (mineral processes) sub-category are attributable to point source facilities, namely asphalt roofing and coating companies. Staff examined the facility permits and found that the VOC emissions are due to storage tanks containing asphalt and petroleum distillate. Tanks that have a volume of 75,000 liters or more are subject to Rule 463, evaluated under Petroleum Production and Marketing – Storage Tanks and Related Losses. The NOx emissions are similarly attributable to point sources, including refineries, industrial gas production facilities, and glass melting facilities. South Coast AQMD Rule 1117 – Emissions from Container Glass Melting and Sodium Silicate Furnaces was identified as applicable and is further evaluated below.

⁶² AP 42, Fifth Edition, Volume I Chapter 11: Mineral Products Industry. Section 11.1 Hot Mix Asphalt Plants. Available at: <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-fifth-edition-volume-i-chapter-11-mineral-products-0>

Cement, concrete, and gypsum manufacturing are the only other sub-categories contributing emissions in the mineral processes category. South Coast AQMD Rule 1112 – Emissions of Oxides of Nitrogen from Cement Kilns was identified as applicable to the Cement Concrete Manufacturing and Fabrication category and is further evaluated in this section, but there was no source-specific NO_x or VOC rule identified for the remaining categories.

b. Evaluation

There are numerous rules that address controls of PM emissions from these facilities, but staff did not identify any source-specific South Coast AQMD control measure or rule related to VOC emissions. However, sources in this category are subject to the general VOC limits in Rule 442 (evaluated under Cleaning and Surface Coatings – Degreasing) and Rule 463 (evaluated under Petroleum Production and Marketing - Storage Tanks and Related Losses). Relevant regulations in other jurisdictions were explored. As in South Coast AQMD, there are several rules that apply to PM emissions, but there are no rules to control VOC emissions from those sources.

South Coast AQMD Rule 1117 is applicable to glass melting facilities which are included in the mineral processes source category. Comparable rules in other districts include SJVAPCD Rule 4354 and BAAQMD Rule 9-12 which are evaluated below in Table 4-75. Emission limits are expressed as pounds of pollutant per ton of product produced.

TABLE 4-75
SOUTH COAST AQMD RULE 1117 COMPARATIVE ANALYSIS

	South Coast AQMD Rule 1117 – Emissions from Oxides of Nitrogen from Glass Melting Furnaces (Amended 6/5/20)	BAAQMD Rule 9-12 – Nitrogen Oxides from Glass Melting Furnaces (Adopted 1/19/94)	SJVAPCD Rule 4354 – Glass Melting Furnaces (Amended 12/16/21)
Applicability	This rule limits the emission of NOx from facilities producing container glass and sodium silicate	This Rule limits the emission of NOx from glass melting furnaces	Any glass melting furnace for the production of, container glass, fiberglass, and flat glass
Exemptions	- Furnaces which are limited by permit to 100 tons of product pulled per calendar year - Glass remelt facilities using exclusively glass cullet, marbles, chips, or similar feedstock in lieu of basic glass-making raw materials. - Furnaces used in the melting of glass for the production of fiberglass exclusively	- Furnaces in which all the heat required for melting is provided by electric current from electrodes submerged in the molten glass, except that heat may be supplied by fossil fuels for start-up when the furnace contains no molten glass - Furnaces with a production capacity of 4550 kilograms (5 short tons) of glass per day or less	Furnaces which heat is provided by electric current from electrodes
Container Glass Emission Limits	NOx Limit of 0.75 lb/ton, averaged over a 30-day rolling period	NOx Limit of 5.5 lb/ton, averaged over any consecutive three-hour period excluding start-up, shutdown, and idling periods	- NOx Limits 0.75 lb/ton, averaged over a 30-day rolling period - VOC Limits 100% air-fired: 20 ppmv @ 8% O₂ (based on 3 hr avg) - oxy-fuel/oxygen: 0.25 lb/ton (based on 3 hr avg)
Sodium Silicate Emission Limits	NOx Limit of 0.50 lb/ton, averaged over a 30-day rolling period	None specified	None specified

Other districts' rules have emission limits applicable to flat glass and fiberglass manufacturers. However, there are only two facilities subject to South Coast AQMD Rule 1117 - one container glass manufacturer and one sodium silicate manufacturer. Thus, limits for other types of glass manufacturing are not considered in Table 4-75.

SJVAPCD Rule 4354 establishes VOC limits for container glass furnaces, which are not addressed in Rule 1117 since the primary focus of Rule 1117 is to regulate NO_x emissions. Facilities subject to Rule 1117 have installed SCR technology with ceramic filter elements to comply with its requirements. Evaluation of SJVAPCD Rule 4354 found that facilities in the Valley have implemented similar control technologies.⁶³ While it is possible that glass melting furnaces in the Basin already comply with the VOC limits specified in Rule 4354, staff determined that installing additional control technology within the two-year implementation timeframe for contingency measures is not feasible. Control technology typically requires extended lead times for design, manufacturing, installation, and testing before becoming operational. Therefore, if additional controls are needed to meet the VOC limits in Rule 4354, it would be infeasible to implement as a contingency measure.

South Coast AQMD Rule 1112 – Emissions of Oxides of Nitrogen from Cement Kilns regulates NO_x emissions from cement kilns used to manufacture gray cement. The NO_x emission limits in Rule 1112 are compared to those in analogous rules at other agencies, including BAAQMD Rule 9-13, MDAQMD Rule 1161, and EKAPCD Rule 425.3 in Table 4-76.

⁶³ SJVAPCD, Rule 4353 Glass Melting Furnaces, December 16, 2021.
<https://ww2.valleyair.org/media/gpaj23xy/rule-4354.pdf>

TABLE 4-76
SOUTH COAST AQMD RULE 1112 COMPARATIVE ANALYSIS

Rule Element	South Coast AQMD Rule 1112 – Emissions of Oxides of Nitrogen from Cement Kilns (Amended 6/6/86)	BAAQMD Rule 9-13 – Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing (Amended 10/19/16)	MDAQMD Rule 1161 – Portland Cement Kilns (Amended 1/22/18)	EKAPCD Rule 425.3 – Portland Cement Kilns (Oxides of Nitrogen) (Amended 11/13/24)
Applicability	Cement kilns for calcining and clinkering limestone, clay, and other raw materials to produce gray cement	Manufacturers of Portland cement	All existing Portland cement kilns operated within the ozone non-attainment area of MDAQMD	All Portland cement manufacturing facilities
Exemptions	Startup, shutdown, or breakdown conditions	-	Startup and shutdown	Startup, shutdown, and breakdown conditions
NOx emission limits	A gray cement kiln shall not be operated unless discharge of NOx into atmosphere is limited to no more than: • 11.6 lb/ton of clinker produced, averaged over 24 consecutive hour period, and • 6.4 lb/ton of clinker produced, averaged over 30 consecutive day period	The 30-operating day rolling average of NOx emissions from the kiln at a Portland cement manufacturing facility shall not exceed 2.3 lb/ton of clinker produced	NOx limits except Start-up and Shut-down periods: • For Preheater-Recalciner Kilns: 2.8 lb/ton of clinker produced when averaged over any 30 consecutive day period; or • For a Portland cement kiln operating with over 15% of heat input from any combination of low-carbon fuels: 3.4 lb/ton of clinker produced when averaged over any 30 consecutive day period	NOx emissions from the kiln at Portland cement manufacturing facility shall not exceed the 30-operating day rolling average limit as follows: • 2.8 lb/ton of clinker produced over a 30 operating day rolling average

Rule 1112 specifies NOx emission limits for gray cement kilns of 11.6 lb/ton of clinker produced over a 24-hour period and 6.4 lb/ton of clinker produced over a 30 day period. In comparison, BAAQMD Rule 9-13 requires a NOx emission limit of 2.3 lb/ton of clinker produced over a 30 operating day period. Both MDAQMD and EKAPCD have similar requirements. MDAQMD Rule 1161 requires a NOx limit of 2.8 lb/ton of clinker produced, averaged over any 30 consecutive day period for Preheater-Recalciner Kilns. For a Portland cement kiln combusting low-carbon fuels, a NOx limit of 3.4 lb/ton of clinker produced is required. EKAPCD Rule 425.3 requires a NOx limit of 2.8 lb/ton of clinker produced.

The NOx limits in Rule 1112 are less stringent than those in other districts' rules. Staff considered a potential contingency measure to lower the NOx limits in Rule 1112. However, ultra-low NOx burners or advanced post-combustion control devices would be needed to achieve lower NOx emissions from cement kilns. This would not be a suitable contingency measure considering that it would be technologically infeasible to design, install, test, and operate advanced emission control technology within two years of the triggering event.

c. Conclusion

Staff does not propose any contingency measures for this category of units, primarily due to the technological infeasibility of implementing the potential measures within two years of the triggering event.

4. Metal Processes

a. Overview

Major source category 440 – Metal Processes includes secondary metal production, metal plating and coating operations, and other unspecified industrial processes that involve mineral and metal products, aluminum, iron, and steel. Sources in this category account for 0.34 tpd of NOx and 0.12 tpd of VOC emissions in 2037 as shown in Table 4-77. Metal melting, metal heat treating, metal heating, and metal forging furnaces are the primary sources of NOx emissions in this category. Metal plating and coating also emit NOx. NOx emissions can be produced as a byproduct from metal treatment processes where nitric acid is used as an oxidant. For example, plating or catalyst recovery involves the reaction of nitric acid and transition metals and emits NOx.

TABLE 4-77
METAL PROCESSES EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Description	VOC (tpd)	NOx (tpd)
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks – working losses	0.00	0.00
338 – Cooling towers	0.00	0.00
440 – Secondary metal production	0.00	0.00
444 – Metal plating and coating operations	0.02	0.10
995 – Other (metal processes)	0.10	0.24

Description	VOC (tpd)	NOx (tpd)
Total	0.12	0.34

b. Evaluation

Staff reviewed control measures established for this source category by South Coast AQMD, SJVAPCD, BAAQMD, VCAPCD, Great Basin Unified APCD (GBUAPCD), and Amador County Air District. South Coast AQMD Rule 1147.2 regulates NOx emissions from metal melting, metal heat treating, and metal heating and forging furnaces that are operated at non-RECLAIM, RECLAIM, and former RECLAIM facilities, requiring a South Coast AQMD permit. Staff also evaluated applicable NOx concentration limits in other air districts' rules, summarized in Table 4-78. Rule 1147.2 has more stringent NOx concentration limits ranging from 15 to 60 ppm for metal melting, heating, forging, and treating furnaces. Note that there are zero NOx and VOC emissions from chrome plating and coating operations and thus, South Coast AQMD Rule 1169 – Hexavalent Chromium - Chrome Plating and Chromic Acid Anodizing, and similar rules in other jurisdictions were not considered in this evaluation.

TABLE 4-78
SOUTH COAST AQMD Rule 1147.2 COMPARATIVE ANALYSIS

	South Coast AQMD Rule 1147.2 – NO _x Reductions from Metal Melting and Heating Furnaces (Adopted 4/1/22)	VCAPCD Rule 74.34 – NO _x Reductions from Miscellaneous Sources (Adopted 12/13/16)	GBUAPCD Rule 404-B – Oxides of Nitrogen (Amended 5/8/96)	BAAQMD Rule 9-3 – Nitrogen Oxides from Heat Transfer Operations (Amended 3/17/82)	Amador County Air District Regulation II, SIP Rule 19 – Fuel Burning Equipment (Adopted 9/14/71)	SJVAPCD Rule 4301 – Fuel Burning Equipment (Amended 12/17/92)
Applicability	Applies to non-RECLAIM, RECLAIM, and former RECLAIM facilities that operate metal melting, metal heat treating, and metal heating and forging furnaces that require a South Coast AQMD permit	Applies to metal heat treating and metal melting furnaces	Applies to combustion equipment	Heat transfer operations	Non-mobile fuel burning equipment	Applies to fuel burning equipment
Control Measure	NO_x limits for existing units For unit size <40 MMBtu/hr: • Metal melting furnace: 40 ppm • Metal heat treating, metal heating, and metal forging: • ≤1,200°F: 40 ppm • >1,200°F: 50 ppm • Units with radiant-tube burners: 50 ppm For unit size ≥40 MMBtu/hr: 15 ppm Alternative NO_x limits for existing units For unit size <40 MMBtu/hr: • Metal melting furnace: 50 ppm • Metal heat treating, metal heating, and metal forging: • ≤1,200°F: 50 ppm	60 ppm NO _x at 3% O ₂	• 125 ppm with natural gas fuel • 225 ppm with liquid or solid fuel	• Existing heat transfer operation limits 175 ppm NO_x when gaseous fuel is burned • New or modified heat transfer operation limits 125 ppm NO_x when natural gas is burned	• 140 lbs/hr NO_x	• 140 lbs/hr NO_x

	South Coast AQMD Rule 1147.2 – NOx Reductions from Metal Melting and Heating Furnaces (Adopted 4/1/22)	VCAPCD Rule 74.34 – NOx Reductions from Miscellaneous Sources (Adopted 12/13/16)	GBUAPCD Rule 404-B – Oxides of Nitrogen (Amended 5/8/96)	BAAQMD Rule 9-3 – Nitrogen Oxides from Heat Transfer Operations (Amended 3/17/82)	Amador County Air District Regulation II, SIP Rule 19 – Fuel Burning Equipment (Adopted 9/14/71)	SJVAPCD Rule 4301 – Fuel Burning Equipment (Amended 12/17/92)
	• >1,200°F: 60 ppm • Units with radiant-tube burners: 60 ppm NOx limits for new units For unit size <40 MMBtu/hr: • Metal heat treating, metal heating, and metal forging: • ≤1,200°F: 30 ppm • >1,200°F: 40 ppm • Units with radiant-tube burners: 40 ppm For unit size ≥40 MMBtu/hr: 15 ppm (All NOx limits above are corrected to 3% O2)					

South Coast AQMD Rule 1159.1 applies to nitric acid tanks used in metal finishing, precious metal reclamation, or expanded graphite foil production operations. NO_x is emitted due to either the reaction of nitric acid with a metal or decomposition of nitric acid at high temperatures. Table 4-79 provides a summary of key requirements in Rule 1159.1. However, staff did not identify any regulations comparable to Rule 1159.1 at the local, state, or federal level, indicating that South Coast AQMD is leading the effort to reduce emissions from this type of process, so further evaluation was not performed.

TABLE 4-79
SOUTH COAST AQMD RULE 1159.1 SUMMARY

Rule 1159.1 – Control of NO _x Emissions from Nitric Acid Tanks (Adopted 12/6/24)	
Applicability	Owners and/or operators of facilities with one or more Nitric Acid Units, defined as tanks, reactors, vessels, or other containers containing nitric acid, where nitric acid either reacts with a metal or decomposes at a temperature greater than 1,700°F, that has been issued or is required to obtain a South Coast AQMD permit
Exemptions	Cleaning Tanks, defined as a tank containing nitric acid used to remove surface contaminants from parts where nitric acid is not intended to react with a metal
Requirements	- Nitric Acid Units must be vented to an Air Pollution Control Device (APCD) that: - Achieves an overall NO_x emissions rate from the combined Nitric Acid Unit(s) vented to the APCD at or below 0.30 pounds per hour (lb/hr). In no case can the combined NO_x emissions rate for all Nitric Acid Units at the facility exceed 0.90 lb/hr; or - Achieves a NO_x control efficiency of 99% - Alternative Compliance Pathway: in lieu of complying with the APCD requirements above, an operator must: - Demonstrate that all Nitric Acid Unit(s) at the facility do not exceed an overall NO_x emissions rate of 0.60 lb/hr; and - Not process a part containing a metal or metal alloy in a Nitric Acid Unit unless all metal(s) with 10.5 percent or greater of the part have been evaluated by an approved source test that demonstrates compliance with the overall NO_x emissions rate of 0.60 lb/hr

c. Conclusion

Staff reviewed the available control measures for the metal processes category and found that the available measures are already being implemented in the Basin. Therefore, no contingency measures are proposed for this source category.

5. Wood and Paper

a. Overview

Major source category 450 – Wood and Paper includes emissions from sawmills, woodworking, pulp and paper manufacturing, and paperboard/fiberboard manufacturing, and other related processes. Paper and paperboard manufacturing facilities are the only sources accounting for 0.26 tpd of VOC and zero NOx emissions in the Basin’s 2037 summer planning emissions inventory summarized in Table 4-80.

TABLE 4-80
WOOD AND PAPER EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Description	VOC (tpd)	NOx (tpd)
338 – Cooling towers	0.00	0.00
450 – Pulp and paper manufacturing	0.21	0.00
452 – Paperboard/fiberboard manufacturing	0.04	0.00
456 – Sawmill/woodworking operations	0.00	0.00
995 – Other (wood and paper)	0.00	0.00
Total	0.26	0.00

*Totals may not sum due to rounding.

b. Evaluation

There is a rule that addresses control of PM emissions from this source category, but staff did not identify any source-specific South Coast AQMD control measure or rule related to VOC emissions from these facilities. However, sources in this category are subject to the general VOC limits in Rule 442 (evaluated under Cleaning and Surface Coatings – Degreasing). Staff explored relevant regulations in other jurisdictions. As in South Coast AQMD, there are rules that apply to PM emissions, but there are no rules to control VOC emissions from these sources.

c. Conclusion

Staff reviewed the available control measures for the wood and paper category and found that the available measures are already being implemented in the Basin. Therefore, no contingency measures are proposed for this source category.

6. Glass and Related Products

No NOx or VOC emissions are reported from source category 460 – Glass and Related Products in the 2037 Basin emissions inventory. Therefore, this source category was not evaluated.

7. Electronics

a. Overview

Major source category 470 – Electronics accounts for 0.02 tpd of VOC emissions and zero NOx emissions in the Basin's 2037 summer planning inventory as shown in Table 4-81. Semiconductor manufacturing, regulated by South Coast AQMD Rule 1164, is the only process that has emissions in this source category.

**TABLE 4-81
ELECTRONICS EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Description	VOC (tpd)	NOx (tpd)
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks – working losses	0.00	0.00
338 – Cooling towers	0.00	0.00
440 – Secondary metal production	0.00	0.00
470 – Semiconductor manufacturing	0.02	0.00
Total	0.02	0.00

b. Evaluation

The only other air district regulation staff identified as applicable to semiconductor manufacturing is BAAQMD Rule 8-30. Table 4-82 compares the VOC control measures for semiconductor manufacturing. In both districts' rules, VOC control measures consist of leak detection and repair, best management practices, and venting emissions to a control device. The requirements in BAAQMD Rule 8-30 are generally similar to those in South Coast AQMD Rule 1164.

**TABLE 4-82
SOUTH COAST AQMD RULE 1164 COMPARATIVE ANALYSIS**

	South Coast AQMD Rule 1164 – Semiconductor Manufacturing (Amended 1/13/95)	BAAQMD Rule 8-30 – Semiconductor Wafer Fabrication Operations (Amended 10/7/98)
Applicability	Direct, indirect, and support stations associated with the manufacture or production of semiconductor devices	Semiconductor wafer fabrication operations are limited to the manufacture of semiconductor and other related integrated circuits
Exemptions	Facilities that produce less than five pounds of total VOC emissions over any continuous 24-hour period	- Facilities whose total combined consumption of solvent-based photoresist and solvent-based photoresist developer is less than 24 gallons per month on a facility wide basis are exempt from photoresist requirements - Low volatility compounds - Solvent cleaning devices with a capacity greater than 10 gallons - Photoresist developers, strippers and cleaning solvents containing less than 10% VOC by weight if

	South Coast AQMD Rule 1164 – Semiconductor Manufacturing (Amended 1/13/95)	BAAQMD Rule 8-30 – Semiconductor Wafer Fabrication Operations (Amended 10/7/98)
		unheated, or less than 2.5% VOC by weight if heated
Equipment and Operating Requirements	Solvent Cleaning Stations - All reservoirs, sinks, tanks and containers which transfer, store, or hold VOC-containing material shall be provided with a full cover or an approved emission control system - All reservoirs and sinks holding fluids with a VOC composite partial pressure of 33 mm Hg or less at 68°F, shall have a freeboard ratio greater than or equal to 1.0, or be equipped with an approved emission control system - Solvent flow of VOC-containing materials shall be applied in a continuous unbroken stream and in a manner which shall prevent liquid loss resulting from splashing - Liquid solvent leaks of 3 drops per minute or more shall be repaired within 24 hours of detection or the equipment shall be shut down until replaced or repaired Photoresist Operations - VOC must be vented to an emission control system Cleanup Solvents - Material requirements: - VOC content limit of 200 g/L; or - VOC composite partial pressure shall not exceed 33 mm Hg at a temperature of 68°F; or - Components being cleaned must be totally enclosed during the washing, rinsing, and draining processes; or - Cleanup solvents must be flushed or drained in a manner that does not allow evaporation into the atmosphere - Storage, transfer, and disposal requirements: - Nonabsorbent, closed containers must be used	Solvent Sinks - All sinks containing VOC shall be provided with a full cover or an approved emission control system - VOC-containing materials shall not be stored or disposed of in a manner that will allow evaporation into the atmosphere - Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down - All unheated solvent sinks containing VOC with a vapor pressure higher than 30 mm Hg at 20°C and all heated solvent sinks shall have a freeboard ratio greater than or equal to 0.75, unless either: - The sink capacity does not exceed 1 liter; or - The sink is abated by an emission control device Photoresist Operations - VOC must be vented to an emission control system Solvent Spray and Vapor Stations - Must operate in a sealed enclosure unless abated by an emission control device - Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down - The station shall not have VOC emissions which exceed 250 lb/month per station unless abated by an emission control device Fabrication Areas - Wipe cleaning of fab areas with a solution containing more than 10% VOC by weight is prohibited
Emission control system requirements	Requires an overall control efficiency of at least 90%	Requires an overall control efficiency of at least 90%

c. Conclusion

Staff reviewed the available control measures for the electronics category and found that the available measures are already being implemented in the Basin. Therefore, no contingency measures are proposed for this source category.

8. Other (Industrial Processes)

a. Overview

Based on the 2037 baseline emissions inventory for the South Coast Air Basin, source category 499 – Other Industrial Processes accounts for 5.37 tpd of VOC and 0.03 tpd of NO_x emissions. The emissions are summarized in Table 4-83. The VOC emissions from roof tanks are controlled by Rule 463, evaluated under the Storage Tanks and Related Losses section of Petroleum Production and Marketing.

Processes under Industrial Use account for 2.11 tpd of VOC and are associated with area sources that employ metalworking fluids and lubricants. South Coast AQMD Rule 1144, evaluated under Cleaning and Surface Coatings – Other, is applicable to these area sources.

Finally, facilities reporting VOC and NO_x emissions under the Other Industrial Processes category include, but are not limited to, metal forging, petroleum and coal products, utilities, glass containers, breweries, sewage treatment, chemical manufacturing and food preparation. In total, there are over 150 unique point sources included in this source category with no contribution from area sources. Due to the large quantity and variety of facilities, it is impractical to analyze each one to identify applicable rules based on their equipment inventory. However, control measures applicable to these facilities are likely evaluated under other source categories. For example, chemical manufacturing facilities with organic liquid storage tanks are subject to Rule 463, evaluated under Petroleum Production and Marketing. Similarly, metal forging facilities are subject to Rule 1147.2, evaluated under Metal Processes, and commercial bakeries are subject to Rule 1153 and 1153.1, evaluated under Food and Agriculture and Fuel Combustion, respectively.

**TABLE 4-83
OTHER INDUSTRIAL EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Source Category	VOC (tpd)	NO _x (tpd)
321 – Tanks (unspecified)	0.00	0.00
322 – Floating roof tanks – breathing losses	0.00	0.00
324 – Floating roof tanks - working losses	1.32	0.00
326 – Fixed roof tanks – breathing losses	0.00	0.00
328 – Fixed roof tanks - working losses	0.65	0.00
332 – Pressure tanks	0.00	0.00
338 – Cooling towers	0.00	0.00
390 – Tank cars and trucks – working losses	0.00	0.00
490 – Recycling processes	0.00	0.00
492 – Storage/transport container cleaning	0.00	0.00

Source Category	VOC (tpd)	NOx (tpd)
907 – Industrial Use	2.11	0.00
995 – Other	1.29	0.03
Total	5.37	0.03

b. Evaluation

As discussed, the only rules identified with applicability to this source category are South Coast AQMD Rules 463 and 1144, which are evaluated under Petroleum Production and Marketing – Storage Tanks and Related Losses and Cleaning and Surface Coatings – Other (Cleaning and Surface Coatings), respectively.

c. Conclusion

Staff evaluation of comparable regulations elsewhere did not identify rules that are more stringent than South Coast AQMD Rules 463 and 1144. Therefore, no potential contingency measure has been identified.

Solvent Evaporation

Major source categories in the solvent evaporation group include 510 – Consumer Products, 520 – Architectural Coatings and Related Process Solvents, 530 – Pesticides/Fertilizers, and 540 – Asphalt Paving and Roofing. Solvent evaporation emits primarily VOC and there are zero NOx emissions associated with these categories. Solvent evaporation accounts for a total of 147.40 tpd of VOC emissions in 2037, with the bulk of the emissions attributable to consumer products. South Coast AQMD has regulatory authority over source categories 520 – Architectural Coatings and Related Process Solvents and 540 – Asphalt Paving and Roofing, while source categories 510 – Consumer Products and 530 – Pesticides/Fertilizers are primarily regulated by CARB.

1. Consumer Products

A consumer product is a chemically formulated product used by household and institutional consumers including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints and adhesives; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. Although each product only contains a small amount of VOC, Californians use over half a billion of these items every year.⁶⁴ Consumer products account for 132.36 tpd of VOC and zero NOx emissions in 2037. A large portion of area source VOC emissions comes from consumer products, which increases over time due to population growth in the region.

⁶⁴ CARB, Consumer Products Program webpage <https://ww2.arb.ca.gov/our-work/programs/consumer-products-program/about>

Consumer products are primarily regulated under the CARB Consumer Products Regulatory Program. However, under California Health & Safety Code § 41712(f) air pollution control districts may regulate consumer products that CARB has not yet regulated. South Coast AQMD Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents was adopted in March 2009 and last amended on December 3, 2010 to reduce VOC emissions from the use, storage and disposal of consumer paint thinners and multipurpose solvents commonly used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations not regulated by CARB at that time. A comparative analysis of Rule 1143 requirements, applicability, and exemptions can be found in Table 4-32.

In September 2009, CARB adopted an amendment to include multi-purpose solvents and paint thinners under the consumer products regulation and established a VOC limit of 30 percent by weight as of December 31, 2010 and a VOC limit of 3 percent by weight as of December 31, 2013. Since CARB's consumer products regulation is statewide, CARB's VOC limits for multi-purpose solvents and paint thinners preempt South Coast AQMD's Rule 1143 VOC limits and are in effect for the Basin. Additionally, an infeasibility justification for consumer products regulated under CARB's authority is presented in Appendix B.

2. Architectural Coatings

a. Overview

Architectural coatings are any coatings used to enhance the appearance of and to protect stationary structures and their appurtenances, including homes, office buildings, factories, pavements, curbs, roadways, racetracks, bridges, and other structures on a variety of substrates. Architectural coatings are typically applied using brushes, rollers, or spray guns by homeowners, painting contractors, and maintenance personnel. Architectural coatings account for 12.44 tpd of VOC and zero NO_x emissions in 2037. This source category is regulated under South Coast AQMD Rules 1113 – Architectural Coatings and 314 – Fees for Architectural Coatings.

Rule 1113 was first adopted in 1977 and most recently amended on February 5, 2016 to limit the VOC content of architectural coatings used in the South Coast AQMD jurisdiction. Rule 1113 applies to any person who supplies, sells, markets, offers for sale, or manufactures any architectural coating that is intended to be applied to stationary structures or their appurtenances, and to fields and lawns. Coating-specific emission limits range from 50 to 730 g/L, depending on coating category. Rule 1113 has a small container exemption for architectural coatings in containers less than one liter, unless otherwise specified in Table 4-44. The small container exemption only applies if the following conditions are met:

- (A) The manufacturer reports the sales in the Rule 314 Annual Quantity and Emissions Report;
- (B) The coating containers of the same specific coating category are not bundled together to be sold as a unit that exceeds one liter, or eight fluid ounces for Flat and Nonflat Coatings and Rust Preventative Coatings, excluding containers packed together for shipping to a retail outlet;

(C) The label or any other product literature does not suggest combining multiple containers so that the combination exceeds one liter, or eight fluid ounces for Flat and Nonflat Coatings and Rust Preventative Coatings.

Rule 314 requires architectural coating manufacturers who sell architectural coatings into or within South Coast AQMD's jurisdiction and are subject to Rule 1113 to electronically submit an Annual Quantity and Emissions Report (AQER). The AQER reports the total annual quantity (in gallons) and emissions of architectural products distributed or sold during the previous year. The emissions inventory for architectural coatings is based on these annual quantity and emissions reports. Fees are assessed on the manufacturers' reported annual quantity of architectural coatings and the cumulative VOC emissions reported annually. Rule 314 affects about 200 architectural coatings manufacturers.

b. Evaluation

Existing regulations for architectural coatings in other jurisdictions that have recently been adopted or amended were evaluated in Table 4-84 and include: MDAQMD Rule 1113, SJVAPCD Rule 4601, SDAPCD Rule 67.0.1, VCAPCD Rule 74.2, Regulations of Connecticut State Agencies (RCSA) Section 22a-174-41a, and the 2020 CARB Suggested Control Measure (SCM) for Architectural Coatings.

This analysis determined that VOC emissions limits in South Coast AQMD Rule 1113 are as stringent as, if not more stringent than, those in other jurisdictions for most architectural coating categories. Rule 1113 sets the most stringent limits for graphic arts and metallic pigmented coatings. Furthermore, Rule 1113 breaks down the industrial maintenance and faux finishing categories with more function-specific emission limits unlike rules in other districts. There are other differences in how categories are defined among districts' rules. For example, basement specialty coatings, concrete/masonry sealers, and waterproofing membranes categories as defined by other districts' rules all fall under the waterproofing concrete/masonry sealers category in South Coast AQMD Rule 1113 that has an equivalent or more stringent VOC limit.

Staff also evaluated the small container exemption in Rule 1113. As shown in Table 4-84, while all districts generally exempt small containers of one liter or less, South Coast AQMD has removed more coatings categories from the small container exemption list than any other district. Staff therefore concludes that South Coast AQMD Rule 1113 is the most stringent with respect to the small container exemption.

c. Conclusion

Staff evaluation of control measures for architectural coatings found that South Coast AQMD rules are as stringent as or more stringent than other air agencies' rules and did not identify any VOC controls for consideration as contingency measures.

TABLE 4-84
COMPARISON OF ARCHITECTURAL COATINGS CONTROL REQUIREMENTS

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
Applicability	Any person who supplies, applies, stores, sells, markets, offers for sale, or manufactures any architectural coating that is intended to be field applied within the District to stationary structures or their appurtenances, and to fields and lawns	Any person who supplies, applies, sells, offers for sale, manufactures, blends or repackages any Architectural Coating for use within the District	Any person who supplies, markets, sells, offers for sale, applies, or solicits the application of any architectural coating, or who manufactures, blends or repackages any architectural coating for use within the District	Any person who manufactures, blends or repackages, supplies, sells, markets, offers for sale, applies, or solicits the application of any architectural coating for use within San Diego County	Any person who markets, supplies, applies, sells, offers for sale, or manufactures, blends, or repackages any architectural coating for use within the District	Any person who sells, supplies, applies, offers for sale or manufactures for sale in the state of Connecticut any architectural coating manufactured on or after May 1, 2018 for use in the state of Connecticut	Any person who supplies, sells, applies, markets, offers for sale, manufactures, blends, or repackages any architectural coating for use within the District
Exemptions	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Certain categories of coatings in containers having a capacity of one liter or less - Any coating in containers having	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Coatings in containers having a capacity of one liter or less	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Coatings in containers having a capacity of one liter or less - Aerosol coating products	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Aerosol coating products - Emulsion type bituminous pavement sealers - Coatings in containers having	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Aerosol coating products - Facilities which apply coatings to test	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the State - Aerosol coating products - An architectural coating manufactured	- Coatings that are supplied, sold, offered for sale or manufactured for use outside of the District - Aerosol coating products - Coatings in containers having a

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
	a capacity of two fluid ounces or less - Emulsion type bituminous pavement sealers - Aerosol coatings products - Use of stains and lacquers in areas at an elevation of 4,000 feet or greater - Facilities which apply coatings to test specimens for purposes of research and development of those coatings	- Aerosol coating products - Colorants added at the factory or at the worksite	Colorants added at the factory or at the worksite	a capacity of one liter or less Colorants added at the factory or at the worksite	specimens for purposes of research and development of those coatings - Coatings in containers having a capacity of one liter or less - Colorants added at the factory or at the worksite	prior to May 1, 2018 - Coatings in containers having a capacity of one liter or less - Transactions involving architectural coatings to, from or within an installation operated by any branch of the U.S. military	capacity of one liter or less Colorants added at the factory or at the worksite
The Small Container exemption does not apply to:	Wood Coatings, including Lacquers, Varnishes, and Sanding Sealers; Concrete-Curing Compounds For Roadways and Bridges; Magnesite Cement Coatings; Multi-Color Coatings; PreTreatment Wash	-	Bituminous Roof Coatings; Flat Coatings that are sold in containers having capacities greater than eight fluid ounces; Magnesite Cement Coatings; Multi-Color Coatings; Nonflat Coatings that are sold in containers	Bituminous Roof Coatings; Flat Coatings that are sold in containers having capacities greater than eight fluid ounces; Magnesite Cement Coatings; Multi-Color Coatings; Nonflat Coatings that are sold in	-	-	-

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
	Primers; Roof Primers, Bituminous; Sacrificial AntiGraffiti Coatings; Stone Consolidants; Repair and Other Swimming Pool Coatings; and Below-Ground and Other Wood Preservatives; Tub and Tile Refinishing Coatings; Clear and Pigmented Shellacs; and Reactive Penetrating Sealers; Flats and Nonflat, Coatings that are sold: (i) In containers having capacities greater than eight fluid ounce, or (ii) For purposes other than touch up; Industrial Maintenance Coatings, including Color Indicating Safety Coatings, High Temperature		having capacities greater than eight fluid ounces; Pre-Treatment Wash Primers; Reactive Penetrating Sealers; Shellacs (Clear and Opaque); Stone Consolidants; Swimming Pool Coatings; Tub and Tile Refinishing Coatings; Wood Coatings, including Lacquers, Varnishes, and Sanding Sealers; and Wood Preservatives	containers having capacities greater than eight fluid ounces; Pretreatment Wash Primers; Reactive Penetrating Sealers; Shellacs (Clear and Opaque); Stone Consolidants; Swimming Pool Coatings; Tub and Tile Refinishing Coatings; Wood Coatings; and Wood Preservatives			

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
	IM Coatings, NonSacrificial Anti-Graffiti Coatings, and Zinc-Rich IM Primers that are sold: (i) In containers having capacities greater than one liter, or (ii) For purposes other than touch up, or (iii) Displayed or advertised for sale at a retail outlet; Rust Preventative Coatings that are sold: (i) In containers having capacities greater than eight fluid ounce, or (ii) For purposes other than touch up						
VOC Content of General Coatings (g/L)							
Flat Coatings	50	50	50	50	50	50	50
Nonflat Coatings	50	50	50	50	50	100	50
VOC Content of Specialty Coatings (g/L)							
Nonflat - High Gloss Coatings	50	-	50	50	50	150	-

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
Aluminum Roof Coatings	100	100	100	100	100	450	100
Basement Specialty Coatings ^a	-	400	400	400	400	400	400
Bituminous Roof Coatings	50	50	50	50	50	270	50
Bituminous Roof Primers	350	350	350	350	350	350	350
Bond Breakers	350	350	350	350	350	350	350
Building Envelope Coatings	50	50	50	50	50	-	50
Concrete Curing Compounds	100	100	350	350	350	350	350
Concrete/Masonry Sealers ^a	-	100	100	100	100	100	100
Driveway Sealers	50	50	50	50	50	50	50
Dry Fog Coatings	50	50	50	50	50	150	50
Faux Finishing Coatings:	-	350	350	350	350	350	350
Clear Topcoat	100	-	-	-	-	-	-
Decorative Coatings	350	-	-	-	-	-	-
Glazes	350	-	-	-	-	-	-
Japan	350	-	-	-	-	-	-
Trowel Applied Coatings	50	-	-	-	-	-	-

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	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
Fire Resistive Coatings	150	150	150	150	150	350	350
Floor Coatings	50	50	50	50	50	100	100
Form-Release Compounds	100	100	100	100	100	250	100
Graphic Arts Coatings (Sign Paints)	200	500	500	500	500	500	500
High Temperature Coatings ^b	-	420	420	420	420	420	420
Industrial Maintenance (IM) Coatings:	100	250	250	250	250	250	250
Color Indicating Safety Coatings	480	-	-	-	-	-	-
High Temperature IM Coatings ^b	420	-	-	-	-	-	-
Non-Sacrificial Anti-Graffiti Coatings	100	-	-	-	-	-	-
Zinc-Rich IM Primers ^c	100	-	-	-	-	-	-
Low Solids Coatings	120	120	120	120	120	120	120
Magnesite Cement Coatings	450	450	450	450	450	450	450

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
Mastic Texture Coatings	100	100	100	100	100	100	100
Metallic Pigmented Coatings	150	500	500	500	500	500	500
Multi-Color Coatings	250	250	250	250	250	250	250
Pre-Treatment Wash Primers	420	420	420	420	420	420	420
Primers, Sealers, and Undercoaters	100	100	100	100	100	100	100
Reactive Penetrating Sealers	350	350	350	350	350	350	350
Recycled Coatings	150	250	250	250	250	250	250
Roof Coatings	50	50	50	50	50	250	50
Rust Preventative Coatings	100	250	250	250	250	250	250
Sacrificial Anti-Graffiti Coatings	50	-	-	-	-	-	-
Shellacs:							
Clear	730	730	730	730	730	730	730
Opaque	550	550	550	550	550	550	550
Specialty Primers, Sealers, and Undercoaters	100	100	100	100	100	100	100
Stains:							

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	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
Exterior/Dual	100	100	-	100	100	250	100
Interior	250	100	250	250	250	250	250
Stone Consolidants	450	450	450	450	450	450	450
Swimming Pool Coatings	340	340	340	340	340	340	340
Tile and Stone Sealer	100	100	100	100	100	-	100
Traffic Marking Coatings	100	100	100	100	100	100	100
Tub and Tile Refinish Coatings	420	420	420	420	420	420	420
Waterproofing Concrete/Masonry Sealers ^a	100	-	-	-	-	-	-
Waterproofing Membranes ^a	-	100	100	100	100	250	250
Wood Coatings	275	275	275	275	275	275	275
Wood Conditioners	100	-	-	-	-	-	-
Wood Preservatives	350	350	350	350	350	350	350
Zinc-Rich Primers ^c	-	340	340	340	340	340	340
VOC Content of Colorants (g/L)							
Architectural Coatings,	50	50	50	50	50	-	50

	South Coast AQMD Rule 1113 – Architectural Coatings (Amended 2/5/16)	MDAQMD Rule 1113 – Architectural Coatings (Amended 10/26/20)	SJVAPCD Rule 4601 – Architectural Coatings (Amended 4/16/20)	SDAPCD Rule 67.0.1 – Architectural Coatings (Amended 2/10/21)	VCAPCD Rule 74.2 – Architectural Coatings (Amended 11/10/20)	RCSA Section 22a-174-41a – Architectural and Industrial Maintenance Coatings (Amended 2/2/18)	2020 CARB SCM for Architectural Coatings (Amended 5/28/20)
excluding IM Coatings							
Solvent-Based IM	600	600	600	600	600	-	600
Waterborne IM	50	50	50	50	50	-	50

^a The Basement Specialty Coatings, Concrete/Masonry Sealers, and Waterproofing Membranes categories as defined by other districts' rules all fall under the Waterproofing Concrete/Masonry Sealers category in South Coast AQMD Rule 1113 that has an equivalent or more stringent VOC limit.

^b The South Coast AQMD Rule 1113 High-Temperature Industrial Maintenance Coatings category has a comparable definition to the High Temperature Coatings category in other districts' rules and an equivalent VOC limit.

^c The South Coast AQMD Rule 1113 Zinc-Rich Industrial Maintenance Primers category has a comparable definition to the Zinc-Rich Primers category in other districts' rules and a more stringent VOC limit.

3. Pesticides and Fertilizers

Pesticides account for 1.19 tpd of VOC and zero NO_x emissions in 2037 due to the use of methyl bromide and other pesticides. However, there are no VOC or NO_x emissions associated with fertilizers in the Basin.

Pesticides are regulated under both federal and state law. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the U.S. EPA has authority to control pesticide distribution, sale, and use. Pesticides used in the United States must first be registered (licensed) by the U.S. EPA and subsequently registered by the Department of Pesticide Regulation (DPR) prior to being distributed, sold or used in California. Registration ensures that pesticides will be properly labeled and will not cause significant adverse effects to human health or the environment. DPR is the agency responsible for regulating the sale and use of pesticides in California. DPR can generally reduce exposures to pesticides through the development and implementation of necessary restrictions on pesticide sales and use and by encouraging integrated pest management. Mitigation measures may be implemented by several methods, including regulations, local permit conditions, pesticide label changes, or product cancellation.

Additionally, an infeasibility justification for pesticides under CARB's authority is presented in Appendix B.

4. Asphalt Paving and Roofing

a. Overview

Major source category 540 – Asphalt Paving and Roofing accounts for 1.41 tpd of VOC and zero NO_x emissions in 2037. A breakdown of these emissions is provided in Table 4-85. This source category is regulated by South Coast AQMD Rules 1108 – Cutback Asphalt, Rule 1108.1 – Emulsified Asphalt, and Rule 470 – Asphalt Air Blowing. There are no NO_x emissions associated with these processes.

**TABLE 4-85
ASPHALT EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY**

Source Category	VOC (tpd)
562 – Road Oils	0.63
564 – Hot-Mix Asphalt	0.07
566 – Emulsified Asphalt	0.40
590 – Asphalt Roofing Operations	0.31
995 – Other	0.00
Total	1.41

Road oils are a type of cutback asphalt, which is a liquid petroleum product produced by fluxing an asphaltic base with suitable distillate and is classed as medium or slow curing grade, as defined in Section 93 of the January 1981, State of California Department of Transportation Standard Specifications. Rule 1108 prohibits the sale or use of any cutback asphalt containing more than 0.5 percent by volume organic compounds which evaporate at 260°C (500°F) or lower.

Emulsified asphalt is a liquid petroleum product produced by fluxing an asphaltic base with water and an emulsifier, and is classed as rapid, medium, or slow curing grade as described under Section 94 of the January 1981, State of California Department of Transportation Standard Specifications. Rule 1108.1 prohibits the sale and use of any emulsified asphalt containing organic compounds which evaporate at 260°C (500°F) or lower in excess of three percent by volume.

Asphalt air blowing is an oxidation process which involves the blowing of air through asphalt, either on a batch or a continuous basis, at a temperature of 240°C to 320°C. The emissions inventory does not provide a sufficient level of detail to ascertain whether asphalt air blowing is used in any of the processes that contribute to emissions under major source category 540. Nevertheless, asphalt air blowing is regulated by Rule 470, which requires that all gases and vapors from asphalt blowing equipment are incinerated at temperatures of not less than 760°C (1,400°F) for a period of not less than 0.3 seconds.

b. Evaluation

Existing regulations for asphalt paving and roofing in other jurisdictions are evaluated in Table 4-86. South Coast AQMD Rules 1108 and 1108.1 were evaluated together to facilitate comparison. Control requirements are generally similar except for MDAQMD Rule 471, which contains specific requirements for asphalt roofing operations. The rule primarily requires close fitting lids and other best management practices during the preparation and transfer of asphalt. South Coast AQMD does not have an equivalent rule applicable to asphalt roofing operations. However, MDAQMD's rule is designed to mitigate odor nuisance during transfer rather than reduce VOC emissions.

c. Conclusion

Staff considered asphalt roofing requirements under MDAQMD Rule 471 as a potential contingency measure. However, the containment of VOC emissions within the roofing kettle does not reduce overall VOC emissions from this process since the kettle contents must be drained and applied to roofs. Assuming that the temperature of the asphalt when it is applied to roofs is the same as in the kettle, the asphalt will emit the same quantity of VOC. Even if this were not the case, there would be a substantial amount of fugitive emissions during cooling. Since this measure would not result in emission reductions, staff determined that it would not be a suitable contingency measure. There were no other potential contingency measures identified for this source category.

TABLE 4-86
COMPARISON OF ASPHALT CONTROL REQUIREMENTS

Rule Element	South Coast AQMD Rule 1108.1 – Emulsified Asphalt (Amended 11/4/83) and Rule 1108 – Cutback Asphalt (Amended 2/1/85)	MDAQMD Rule 471 – Asphalt Roofing Operations (Amended 12/21/94)	SJVAPCD Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations (Amended 12/17/92)	SMAQMD Rule 453 – Cutback and Emulsified Asphalt Paving Materials (Amended 8/31/82)	BAAQMD Rule 8-15 – Emulsified and Liquid Asphalts (Amended 6/1/94)
Applicability	Any person who supplies, sells, markets, offers for sale, or uses emulsified or cutback asphalt	Any person who operates equipment used for melting, heating, or holding asphalt or coal tar pitch	Manufacturers and users of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations	Any person who supplies, sells, markets, offers for sale, or uses cutback or emulsified asphalt	Any person who supplies, sells, markets, offers for sale, or uses cutback or emulsified asphalt
Exemptions	Emulsified or cutback asphalt for which other source-specific rules apply	- Equipment having a capacity of 100 liters (26.4 gallons) or less. - Equipment having a capacity of 600 liters (159 gallons) or less which is equipped with a close fitting lid and not opened except for loading the kettle	- Asphalt manufactured for shipment and use outside of the District - Medium cure asphalt when the National Weather Service official forecast of the high temperature for the 24-hour period following application is below 50°F	- Use of cutback asphalt or emulsified asphalt in the manufacturing of paving materials where such materials are for immediate shipment and eventual use outside of the County of Sacramento - Medium cure cutback asphalt as a penetrating prime coat until suitable substitute is identified (evaluated annually)	Medium cure asphalt when the National Weather Service official forecast of the high temperature for the 24-hour period following application is below 50°F

Rule Element	South Coast AQMD Rule 1108.1 – Emulsified Asphalt (Amended 11/4/83) Rule 1108 – Cutback Asphalt (Amended 2/1/85)	MDAQMD Rule 471 – Asphalt Roofing Operations (Amended 12/21/94)	SJVAPCD Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations (Amended 12/17/92)	SMAQMD Rule 453 – Cutback and Emulsified Asphalt Paving Materials (Amended 8/31/82)	BAAQMD Rule 8-15 – Emulsified and Liquid Asphalts (Amended 9/16/87)
Control Measure	- Emulsified asphalt cannot contain more than 3% VOC by volume at temperatures $\leq 260^{\circ}\text{C}$ (500°F) - Cutback asphalt cannot contain more than 0.5% VOC by volume at temperatures $\leq 260^{\circ}\text{C}$ (500°F)	- Equipment used for melting, heating, or holding asphalt or coal tar pitch must employ a close fitting lid that shall not be opened except for loading the kettle or when the kettle is $<150^{\circ}\text{F}$ - Roofing kettles must adhere to the following temperature limits: 500°F for asphalt 400°F for coal tar pitch - During roofing kettle draining, the kettle must be contained by a close fitting lid and the receiving vessel must also be covered by a close fitting lid or capped within 2 minutes - Kettle vents must remain closed except during a pressure release	- For penetrating prime coat, tack coat, dust palliative, or other paving and maintenance operations: - The use of rapid and medium cure cutback asphalts are prohibited - Slow cure asphalt must not contain more than 0.5% VOC at temperatures $\leq 260^{\circ}\text{C}$ (500°F) - Emulsified asphalt must not contain more than 3% VOC by volume at temperatures $\leq 260^{\circ}\text{C}$ (500°F)	- Cutback asphalt: - The use of rapid and medium cure cutback asphalts are prohibited - Slow cure asphalt containing VOC at temperatures $\leq 260^{\circ}\text{C}$ (500°F) is prohibited - Emulsified asphalt cannot contain more than 3% VOC by volume at temperatures $\leq 260^{\circ}\text{C}$ (500°F)	- The use of rapid and medium cure cutback asphalts are prohibited - Slow cure asphalt must not contain more than 0.5% VOC at temperatures $\leq 260^{\circ}\text{C}$ (500°F) - Emulsified asphalt cannot contain more than 3% VOC

Miscellaneous Processes

1. Residential Fuel Combustion

a. Overview

Major source category 610 – Residential Fuel Combustion consists of several subcategories, including wood combustion and fuel combustion (space heating, water heating, cooking, and other appliances, such as clothes dryers, barbecues, and water heaters used for pools, spas and hot tubs). Residential wood combustion sources are evaluated in this section; fuel combustion sources (particularly space heaters and water heaters) were previously evaluated in this chapter.

Residential wood combustion sources account for 0.12 tpd of NO_x and 1.40 tpd of VOC emissions in 2037 (approximately 0.06 percent and 0.21 percent of overall NO_x and VOC emissions, respectively). Residential wood burning includes wood-burning heaters (i.e., woodstoves, pellet stoves, and wood-burning fireplace inserts), which are used primarily for heat generation, and wood-burning fireplaces, which are used primarily for aesthetic purposes.

One of the most effective ways to reduce VOC and NO_x emissions is through a curtailment program that restricts use of wood-burning heaters and fireplaces on days that are conducive to poor air quality. South Coast AQMD Rule 445 – Wood Burning Devices - establishes requirements for the sale, transfer, operation, and installation of wood burning devices and on the advertising of wood for sale intended for burning. Among those requirements is a wood burning curtailment program that implements ozone and PM_{2.5} contingency measures in the Basin. PM_{2.5} reductions from Rule 445 are not evaluated in this document since PM_{2.5} is not an ozone precursor.

b. Evaluation

Rule 445 includes contingency measures for ozone and PM_{2.5} standards in the South Coast Air Basin and was submitted for inclusion into the SIP. U.S. EPA approved the PM_{2.5} contingency measures but deferred action on the ozone portion.⁶⁵ The first ozone contingency measure in Rule 445 would be triggered upon U.S. EPA's finding of failure to attain the 1997 8-hour ozone standard in the South Coast Air Basin. U.S. EPA proposed a finding to failure to attain the standard on August 15, 2024.⁶⁶ As of July 2025, it has not been finalized. The ozone contingency measure implements a wood burning curtailment program from September through April. During these months, curtailment will be triggered when 8-hour ozone levels are forecast to exceed 80 ppb in any area of the Basin. Rule 445 contains two additional contingency measures that will be triggered sequentially upon U.S. EPA finding that the South Coast Air Basin failed to meet a milestone or attain an applicable ozone standard. These two measures would lower the wood burning

⁶⁵ U.S. EPA, Air Plan Approval; California; Los Angeles—South Coast Air Basin, 87 Fed. Reg. 12866 (March 8, 2022). <https://www.federalregister.gov/documents/2022/03/08/2022-04761/air-plan-approval-california-los-angeles-south-coast-air-basin>

⁶⁶ U.S. EPA, Finding of Failure To Attain the 1997 8-Hour Ozone Standards; California; Los Angeles-South Coast Air Basin, 89 Fed. Reg. 66291 (August 15, 2024). <https://www.federalregister.gov/documents/2024/08/15/2024-17573/finding-of-failure-to-attain-the-1997-8-hour-ozone-standards-california-los-angeles-south-coast-air>

curtailment threshold to 75 ppb and 70 ppb, respectively, from September through April.

As of January 2025, Rule 445 is undergoing an amendment process to remove the low-income exemption from the curtailment program.⁶⁷ Removal of the low-income exemption is expected to further reduce VOC and NOx emissions on days when ozone levels are forecasted to exceed 80 ppb during the curtailment season. The rule amendment implements a control measure from the PM2.5 Plan to fulfill Most Stringent Measure requirements mandated by Clean Air Act Section 188(e).⁶⁸ As this measure is needed to fulfill a SIP commitment, it is ineligible for consideration as a contingency measure.

Staff is not aware of any other district that implements a wood burning curtailment program governed by forecasted ozone levels. With the proposed Rule 445 amendment, South Coast AQMD will implement the most stringent wood burning curtailment program.

c. Conclusion

South Coast AQMD Rule 445 already implements ozone contingency measures. In addition, Rule 445 has been demonstrated to implement the most stringent wood burning curtailment program compared to all other air districts and no additional contingency measures are proposed.

2. Farming Operations

a. Overview

Source category 620 – Farming Operations consists of stationary source emissions related to animal husbandry and crop farming. This source category accounts for 1.30 tpd of VOC and zero NOx emissions in the Basin’s 2037 summer planning inventory. All stationary source VOC emissions from farming operations are attributable to livestock waste, with cattle accounting for 82 percent of the VOC emissions.

b. Evaluation

South Coast AQMD Rules 223 and 1127 apply to this source category. Table 4-87 summarizes the rule requirements.

TABLE 4-87
SOUTH COAST AQMD VOC CONTROL MEASURES FOR FARMING OPERATIONS

Rule	Applicability	Control Measure
Rule 223 – Emission Reduction Permits for Large Confined Animal Facilities (Adopted 6/2/06)	Applies to Large Confined Animal Facilities (CAFs), defined as those having: 1,000 or more milk-producing dairy cows; or	Requires large CAFs to obtain permits with information necessary to prepare an emissions inventory of all regulated air pollutants emitted from the operation

⁶⁷ South Coast AQMD, Proposed Amended Rule 445 (December 17, 2024). <https://www.aqmd.gov/home/rules-compliance/rules/scagmd-rule-book/proposed-rules/rule--445>

⁶⁸ South Coast AQMD, 2012 Annual PM2.5 Plan (June 7, 2024). [https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-\(sip\)-revisions/2012-annual-pm2-5-plan](https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan)

Rule	Applicability	Control Measure
	• 3,500 or more beef cattle; or • 7,500 or more calves, heifers, or other cattle; or • 100,000 or more turkeys; or • 650,000 or more chickens other than laying hens; or • 650,000 or more laying hens; or • 3,000 or more swine; or • 15,000 or more sheep, lambs, or goats; or • 2,500 or more horses; or • 650,000 or more ducks; or • 30,000 or more rabbits or other animals	• Requires dairy owners/operators to implement at least: • six of 12 corral measures; and • two of seven solid manure or separated solids handling measures; and • one of eight liquid manure handling measures; and • two of four land application measures • Requires poultry owners/operators to implement at least: • one of seven solid manure or separated solids handling measures; and • one of eight liquid manure handling measures
Rule 1127 – Emission Reductions from Livestock Waste (Adopted 8/6/04)	Applies to dairy farms and related operations such as heifer and calf farms and the manure produced on them. It also applies to manure processing operations, such as composting operations and anaerobic digesters	• Manure must be disposed at a manure processing operation, on agricultural land, or a combination of the two • Manure processing operators are required to process manure using: • An anerobic digester; or • A composting or alternative composting operation that complies with Rule 1133 and/or 1133.2 requirements • Alternative composting operations must begin composting within two working days of arrival on-site

Each Confined Animal Facility (CAF) consists of multiple distinct sources of emissions. Since CAFs generally cover a large area and have different processes, a single mitigation measure or technology is generally not sufficient to control overall emissions from the facility. To accommodate the unique operational nature of CAFs, Rule 223 allows operators of dairies and poultry farms to select from a menu of mitigation measures.

Rule 223 currently applies to dairies with 1,000 cattle and poultry farms with 650,000 birds. However, as of January 2025, a rule amendment process is underway to lower the applicability thresholds to 500 and 400,000 for dairy cattle and birds, respectively.⁶⁹ The rule amendment implements a control measure from the PM2.5 Plan to fulfill Most Stringent Measure requirements mandated by Clean Air Act Section 188(e).⁷⁰ As this measure is needed to fulfill a SIP commitment, it is ineligible for consideration as a contingency

⁶⁹ South Coast AQMD, Proposed Amended Rule 223. <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-223>

⁷⁰ South Coast AQMD, 2012 Annual PM2.5 Plan (June 7, 2024). [https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan\(sip\)-revisions/2012-annual-pm2-5-plan](https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan(sip)-revisions/2012-annual-pm2-5-plan)

measure.

Staff is not aware of another district rule equivalent to South Coast AQMD Rule 1127 that applies only to dairies and manure processing operations. Therefore, no further evaluation was performed.

c. Conclusion

Rule 223 is undergoing an amendment process to lower the applicability thresholds for dairies and poultry farms. Once the amendment has been adopted, Rule 223 will be as stringent or more stringent than other districts' rules. No contingency measure opportunities were identified for this source category.

3. Fugitive Dust Categories

Fugitive dust source categories include 630 – Construction and Demolition, 640 – Paved Road Dust, 645 – Unpaved Road Dust, and 650 – Fugitive Windblown Dust. Fugitive dust emissions are typically generated through the pulverization of surface materials by mechanical force or by entrainment of dust particles in turbulent air streams.⁷¹ These categories do not contribute to any VOC or NOx emissions and, therefore, were not further evaluated.

4. Fires

Source Category 660 – Fires includes emissions from automobile and structural fires. The structural fire subcategory includes residential and commercial structures as well as mobile home fires. The fires source category accounts for 0.29 tpd of VOC and 0.08 tpd of NOx emissions in the Basin's 2037 emissions inventory. The reported emissions are based on the number of vehicle fires per year and based on structural fires data from California Fire Incident Reporting System from the California State Fire Marshall's Office.⁷² Considering the fires under this source category are non-routine and unpredictable, no control measures have been identified to mitigate emissions from these sources.

5. Managed Burning and Disposal (Open Burning)

a. Overview

Major source category 670 – Managed Burning and Disposal consists of numerous sub-categories including various agricultural burning, forest management, and non-agricultural open burning. This source category accounts for 0.22 tpd of VOC and 0.10 tpd of NOx emissions in the Basin's 2037 emissions inventory. A detailed breakdown of these emissions is shown in Table 4-88. South Coast AQMD Rule 444 – Open Burning

⁷¹ U.S. EPA, "Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources," Chapter 13, Section 2, available at https://www.epa.gov/sites/default/files/2020-10/documents/13.2_fugitive_dust_sources.pdf (last updated January 1995)

⁷² CARB 1999 emission inventory summary for structure and automobile fires: <https://www.arb.ca.gov/ei/areasrc/arbmiscprocfires.htm>

has strict requirements for when and which types of burns are allowed.

TABLE 4-88
OPEN BURNING EMISSIONS BASED ON 2037 SUMMER PLANNING INVENTORY

Source Category	VOC (tpd)	NOx (tpd)
660 – Agricultural Burning - Prunings	0.01	0.01
662 – Agricultural Burning - Field Crops	0.00	0.00
664 – Range Improvement	0.09	0.07
666 – Forest Management	0.08	0.01
668 – Weed Abatement	0.05	0.02
Total	0.22	0.10

i. Burning of Agricultural Materials

Agricultural burning involves open burning of vegetative materials produced from growing and harvesting of crops. It includes the burning of grass and weeds in fence rows, ditch banks and berms in no-till orchard operations, the burning of fields being prepared for cultivation, the burning of agricultural wastes, and the operation or maintenance of a system for the delivery of water for agricultural operations. The associated VOC and NOx emissions are both very small (less than 0.01 tpd).

ii. Land Management and Hazard Reduction Burning

Prescribed burning is the planned application of fire conducted by state and federal land managers, local governments, utilities and private land owners to meet planned resource management objectives, such as forest management, wildlife habitat management, range improvement, fire hazard reduction, wilderness management, weed abatement, watershed rehabilitation, vegetation manipulation, disease and pest prevention, and ecosystem management. Hazard reduction burning involves the disposal of dry brush surrounding homes and businesses in the wildland-urban interface in order to ensure a barrier of fire protection of 100 feet in all directions.

b. Evaluation

Table 4-89 briefly summarizes Rule 444 requirements and Table 4-90 briefly summarizes the control measures in other jurisdictions.

TABLE 4-89
RULE 444 REQUIREMENTS

Applicability	Requirements
• Agricultural burning • Disposal of Russian thistle • Prescribed burning • Fire prevention/suppression training; • Open detonation or use of pyrotechnics • Fire hazard removal • Disposal of infectious waste, other than hospital waste, research of testing materials, equipment or techniques • Disposal of contraband • Residential burning Beach burning Exemptions: • Fire suppression training by fire agencies • Open burning to protect crops from freezing • Open burning on islands located 15 miles or more from the mainland • Fireworks display • Explosives detonation • Recreational and ceremonial fires • Food preparation fires and fires for warmth at social gatherings	• No specific agricultural crop phase outs or bans • Burning of waste/garbage is prohibited • No burning except on permissive burn days or marginal burn days on which burning is permitted in the applicable source or receptor area, and such burning is not prohibited by the applicable public fire protection agency • Specific requirements for burn authorization requests and permit conditions for each category of burning

**TABLE 4-90
OTHER CONTROL MEASURES CONSIDERED (MANAGED BURNING AND DISPOSAL)**

Measure	Applicability	Requirements
SJVAPCD Rule 4103 – Open Burning (Amended 4/15/10)	Open burning conducted in the San Joaquin Valley Air Basin, except for prescribed burning and hazard reduction burning (regulated under District Rule 4106) Exemptions: • Fires used for cooking, campfires, and religious fires with clean fuel, dry wood or charcoal • Emergency burning by a fire agency • Respectful burning of an unserviceable American Flag • Bags used for agricultural chemicals • Raisin trays	• No burning of garbage or other materials • Burning shall be allocated by the APCO dependent on dispersion conditions and shall avoid negative impacts to receptors • No permit shall be issued for the burning of the field crops, prunings, weed abatement, orchard removals, vineyard removals, surface harvested prunings and other materials, except for crops for which the Board has determined that there is no economically feasible alternative means of eliminating the waste and the continued issuance of permits for that specific category or crop will not cause a violation of air quality standards • Additional requirements for burning times, drying times, contraband burning • Permit required for burning of Russian Thistle • Conditional burning permit required for diseased materials with specific requirements • Burn plans required for fire suppression training, burning of contraband • BMP selection required for weed maintenance

Measure	Applicability	Requirements
SJVAPCD Rule 4106 – Prescribed Burning and Hazard Reduction Burning (Adopted 6/21/01)	Applies to all prescribed burning and to hazard reduction burning in wildland-urban interface	• No burning of garbage or green waste • District allocates burning permits based on predicted meteorological conditions and whether contaminants could create or contribute to an exceedance of an ambient air quality standard or impact smoke sensitive areas • Requirements such as minimizing smoke, ignition devices, keeping vegetation free of dirt, soil, and moisture • Requirement for prescribed burn conductors to complete prescribed burning smoke management training class approved by the APCO • Permits required for all hazard reduction burning, valid only on days that burning is not prohibited by the CARB, by the District or other designated agencies
BAAQMD Regulation 5 – Open Burning (Amended 11/20/19)	Open burning activities Exemptions: • Fires set only for cooking • Fires burning as safety flares or for the combustion of waste gases • Flame cultivation when the burning is performed with LPG or natural gas-fired burners designed and used to kill seedling grass and weeds and the growth is such that the combustion will not continue without the burner • Fires set for the purposes of fire training using one gallon or less of flammable liquid per fire	• No specific agricultural crop phase-outs or bans • Recreational fires allowed on non-curtailement days • On permissive burn days, numerous select fire types are allowed with permission from the APCO

Measure	Applicability	Requirements
SMAQMD Rule 501 – Agriculture Burning (Amended 4/3/97)	Agricultural burning, including: • Agricultural waste disease prevention • Range improvement • Forest, wildlife and game habitat, irrigation system, and wild land vegetation management • Paper containers of agricultural chemicals Contains similar exemptions as San Joaquin Valley for agricultural operations, including burning of bags used for agricultural chemicals and emergency agricultural burns which would cause economic loss if denied	• No specific crop phase outs or bans (subject to air basin-wide rice burning reduction) • Permit holder must contact District for permission to burn and ensure that it is not a no-burn day and must contact the fire protection agency having jurisdiction over the burn location • Contains specific drying time requirements for different agricultural materials
VCAPCD Rule 56 – Open Burning (Adopted 11/11/03)	Combustible materials in open outdoor fires Exemptions: • Fires used only for the heating or cooking of food for human consumption • Recreational fires confined to a fireplace or barbecue pit • Flag burning • Fire suppression training • Fire agency or public officer may set fires to reduce hazards as needed	• No specific crop phase-outs or bans • Permit required for open burning • Burning only allowed on permissive burn days • Open burning allowed for the disposal of agricultural wastes in the pursuit of agricultural operations, range improvement burning, wildland vegetation management burning, levee, reservoir, or ditch maintenance and the disposal of Russian thistle • Burn times, drying times, and permit conditions also specified

Measure	Applicability	Requirements
Placer County APCD (PCAPCD) Rule 301 – Nonagricultural Burning Smoke Management (Amended 8/9/18)	Open outdoor fires, including the use of burn barrels Exemptions: • Fire hazard reduction burning • Public officer waiver • Recreational or cooking fire • American Flag • Open burning conducted by public officers	• No person shall ignite or allow open outdoor burning without a valid burn permit from the District for fire hazard reduction, mechanized burner, open burning conducted by public officers, right of way clearing, levee, ditch and reservoir maintenance • Separate burn permit required from fire protection agency with jurisdiction in area of the proposed burn project • Air Pollution Control Officer may prohibit or add additional specific burn permit conditions

Staff did not identify any more stringent requirements in other districts' rules except those in SJVAPCD Rule 4103. Rule 4103 prohibits agricultural burns except if it is determined that no feasible alternative exists. In accordance with Rule 4103, SJVAPCD evaluated the economic and technologic feasibility of alternatives to burning and requested CARB concurrence to postpone burn prohibitions for some crop categories.⁷³ CARB provided concurrence through December 31, 2024.⁷⁴ Effective January 1, 2025, SJVAPCD will implement a near-complete prohibition of agricultural burning.

Agricultural burning is extremely limited in the Basin as evidenced by the very small emissions inventory (0.002% and 0.005% of the total VOC and NOx emissions, respectively, in the Basin). Chipping and grinding is the primary alternative to agricultural burning. However, chipping and grinding usually has a high incremental cost compared to burning. Due to the high incremental cost, SJVAPCD provides incentives ranging from \$300/acre to \$1,300/acre depending on the crop and whether soil incorporation is included.⁷⁵ Further, agricultural burning is much more prevalent in the SJVAPCD. The extent of burning is reported annually to CARB based on the acreage of crops cleared to produce a burn pile. In 2022, there were only 10.1 acres cleared for agricultural burning in the Basin.⁷⁶ By comparison, there were 33,451 acres cleared in 2022 for agricultural burning in the SJVAPCD.⁷⁷ The extremely limited extent of agricultural burning in the Basin combined with the high cost of alternatives suggests that this measure is economically infeasible and would have an inconsequential impact on air quality. Moreover, the total VOC and NOx emissions from agricultural burning are less than 5 percent of OYW of progress in the Basin. Thus, potential contingency measures for agricultural burning can be excluded from further consideration as they would be considered "unquestionably negligible" per U.S. EPA's guidance.

Regarding prescribed burns and range improvement, staff did not identify any more stringent provisions in other districts' rules. Furthermore, these programs have a proven record of reducing wildfire severity and therefore have implications for public safety. There are renewed efforts to drastically increase the number of acres treated by prescribed fire in order to reduce the air quality impacts of increasingly intense wildfires caused by years of drought due to climate change and past forest management practices that have allowed the accumulation of the understory in forests throughout the west. Forest management through prescribed fire reduces overall emissions by reducing the intensity and available fuel of wildfires occurring on recently treated lands.

The distinct wet and dry seasons in the Basin along with poor summertime air quality that may restrict prescribed fire for nearly half of a year in some locations make finding suitable conditions for prescribed fire extremely challenging for fire agencies. Placing further restrictions on prescribed fires is inconsistent

⁷³ SJVAPCD, Final 2020 Staff Report and Recommendations on Agricultural Burning, December 17, 2020.

<https://ww2.valleyair.org/media/wjgk2hzi/2020-ag-burn-report.pdf>

⁷⁴ CARB, Letter of Concurrence for SJVAPCD Agricultural Burning, June 18, 2021.

https://ww2.arb.ca.gov/sites/default/files/2021-06/SJV_Ag_Burn_Concurrence_Letter_061821.pdf

⁷⁵ SJVUAPCD Governing Board Item Number 10: Accept and Appropriate \$178,200,000 in State Funding and Approve Enhancements to Alternatives to Agricultural Open Burning Incentive Program.

https://www.valleyair.org/Board_Meetings/Gb/Agenda_Minutes/Agenda/2021/August/Final/10.Pdf

⁷⁶ South Coast AQMD Open Burn Program Log Book

⁷⁷ Email from Leland Villalvazo, SJVAPCD, September 11, 2023

with the goal of increasing the number of acres treated by prescribed fire and may result in higher intensity wildfires, increased threats to life and property, and increased emissions that occur from fires that burn on untreated lands. Given these considerations, contingency measures for prescribed burns are infeasible.

c. Conclusion

There are no feasible contingency measures for this source category that could be implemented within two years and result in significant emission reductions within that time frame.

6. Commercial Cooking

a. Overview

Major source category 690 – Commercial Cooking mostly includes emissions from commercial charbroiling, deep fat frying, and general cooking. The majority of emissions in this category come from charbroiling, which consists of two types of commercial charbroilers: chain-driven and under-fired. A chain-driven charbroiler is a semi-enclosed broiler that moves food mechanically through the device on a grated grill to cook the food for a specific amount of time. An under-fired charbroiler has a metal "grid," a heavy-duty grill similar to that of a home barbecue, with gas burners, electric heating elements, or solid fuel (wood or charcoal) located under the grill to provide heat to cook the food. Under-fired charbroilers are widely used in commercial kitchens to cook meats, including beef, burgers, and chicken. These heavy-duty appliances commonly use evenly spaced, gas-fired burners to produce direct-flame, radiant heat a few inches below slatted, cast-iron cooking surfaces.⁷⁸ The slatted cooking surface allows fat, oil, and grease (FOG) from the meat to fall into the burner flames, which produces flaring that brings the flame into direct contact with the meat. Charbroilers do not include flat-top or plancha grills with continuous cooking surfaces that prevent the flame from directly contacting the meat.

Commercial cooking sources account for 1.21 tpd of VOC emissions and zero NO_x emissions in the Basin's 2037 inventory. Under-fired and chain-driven charbroilers contribute about 80 percent of the VOC emissions from commercial cooking. For under-fired charbroilers, grease is typically captured by the grease filter of the ventilation hood over the charbroiler with the remaining VOC exhausted unless a secondary control is installed. Catalytic oxidizers are used to control VOC emissions from chain-driven charbroilers, but they are not effective for reducing emissions from under-fired charbroilers. For under-fired charbroilers, the exhaust from these devices loses heat as it is directed to the control device, and the reactions at the catalyst cannot take place under these lower temperatures. Thus, electrostatic precipitators (ESP) and filter media are anticipated to be the potential control technologies for reducing

⁷⁸ Specifications for Commercial Hoods and Kitchen Ventilation in the 2019 California Mechanical Code are classified under four duty categories: light, medium, heavy, and extra-heavy duty cooking service. Gas underfired charbroilers are listed as heavy-duty cooking appliances. Charbroilers utilizing solid fuel (e.g., charcoal, wood) are classified as extra-heavy-duty and are outside the scope of this evaluation. Available at <https://epubs.iapmo.org/2019/CMC/index.html#p=136>

PM_{2.5} emissions from under-fired charbroilers, but these technologies have little, if any, benefit for reducing VOC emissions.⁷⁹

b. Evaluation

Rule 1138 – Control of Emissions from Restaurant Operations reduces VOC emissions from commercial cooking by requiring catalytic oxidizers for chain-driven charbroilers that cook greater than or equal to 875 pounds of meat per week. Currently, Rule 1138 does not require emissions controls for under-fired charbroilers. However, given that available control technologies for under-fired charbroilers primarily reduce PM_{2.5} emissions, it is unclear how effective these technologies would be at controlling VOC emissions. Therefore, staff determined that further evaluation of control measures for under-fired charbroilers was unwarranted.

In evaluating chain-driven charbroiler control measures, staff reviewed SJVAPCD’s Rule 4692, as U.S. EPA found in 2020 that the rule satisfies stringent control requirements such as Best Available Control Measures and Most Stringent Measures. U.S. EPA noted that “Rule 4692 implements the most stringent measures adopted or demonstrated to be technically and economically feasible for commercial chain-driven charbroilers.”⁸⁰ Rule 4692 reduces VOC emissions by requiring catalytic oxidizers for chain-driven charbroilers cooking 400 pounds of meat or more per week. This threshold is more stringent than that in South Coast AQMD Rule 1138 (875 pounds of meat or more per week). Finally, staff reviewed chain-driven charbroiler regulations in other jurisdictions such as BAAQMD, VCAPCD, and New York City. The evaluation is summarized in Table 4-91.

⁷⁹ San Joaquin Valley Air Pollution Control District. Commercial Underfired Charbroiler Emissions Control Technologies. Available at <http://www.valleyair.org/Grants/documents/rctp/Charbroiler-Control-Technologies.pdf> (accessed 06/01/2022)

⁸⁰ Technical Support Document, EPA Evaluation of BACM/MSM for the San Joaquin Valley PM_{2.5} Plan for the 2006 PM_{2.5} NAAQS, p. 30-36 (February 2020). Retrieved from: <https://downloads.regulations.gov/EPA-R09-OAR-2019-0318-0005/content.pdf>

TABLE 4-91
COMPARISON OF CONTROL MEASURES FOR CHAIN-DRIVEN CHARBROILERS

Rule	Applicability	Control Measure
South Coast AQMD Rule 1138 – Control of Emissions from Restaurant Operations (Amended 11/14/97)	Chain-driven charbroilers Exemptions: - Facilities that accept a permitting condition limiting the amount of meat cooked to less than 875 lbs per week - Facilities that submit testing showing that emissions are less than 1 lb per day of any criteria pollutant	Only operate a chain-driven charbroiler with an approved catalytic oxidizer
SJVAPCD Rule 4692 – Commercial Charbroiling (Amended 6/21/18)	Chain-driven charbroilers and underfired charbroilers at commercial cooking operations Exemptions: If a chain-driven or underfired charbroiler cooks less than 400 lbs of meat per week, OR less than 10,800 lbs in the most recent 12-month rolling period and the total amount of meat cooked per week does not exceed 875 lbs	Chain-driven charbroilers: Reduce VOC emissions by 86% through the installation of an approved catalytic oxidizer. Catalytic oxidizers certified by South Coast AQMD are compliant Underfired charbroilers: Registration requirement; weekly recordkeeping requirement for both charbroiler categories
VCAPCD Rule 74.25 – Restaurant Cooking Operations (Amended 10/12/04)	Conveyorized (chain-driven) charbroilers Exemptions: Charbroilers placed into service prior to Oct. 2005 that cook less than 875 lbs per week	Requires the installation of an approved control device to reduce VOC emissions by 83%. Catalytic oxidizers certified by South Coast AQMD are compliant

Rule	Applicability	Control Measure
BAAQMD Rule 6-2 – Commercial Cooking Equipment (Adopted 12/5/07)	Chain-driven charbroilers at commercial cooking operations. Exemptions: Chain-driven charbroilers that cook less than 400 lbs of beef per week	Requires the installation of a certified catalytic oxidizer (controlled to 0.32 lbs of VOC per 1,000 lbs of beef cooked). Catalytic oxidizers certified by South Coast AQMD are compliant.
City of New York Title 24 of the Administrative Code, Section 24-149.4 – Commercial Char broilers (Amended 5/6/16) and NYC Rules, Title 15, Section 37-02 – Requirements for Emissions Control Devices (Amended 9/16/16)	Chain-driven charbroilers at commercial cooking operations Exemptions: Charbroilers that cook less than 875 lbs of meat per week	Requires catalytic oxidizer or other control device. Catalytic oxidizers certified by South Coast AQMD are compliant.

All other rules and regulations evaluated reference South Coast AQMD’s list of certified catalytic oxidizers.⁸¹ With the exception of the applicability threshold in Rule 1138, staff did not identify any more stringent provisions in other jurisdictions’ regulations. As of January 2025, Rule 1138 is undergoing an amendment process to lower the applicability threshold for chain-driven charbroilers to 400 pounds of meat cooked per week, matching the stringency of SJVAPCD Rule 4692.⁸² The rule amendment implements a control measure from the PM2.5 Plan to fulfill Most Stringent Measure requirements mandated by Clean Air Act Section 188(e).⁸³ As this measure is needed to fulfill a SIP commitment, it is ineligible for consideration as a contingency measure.

c. Conclusion

Staff did not identify any potential contingency measures for this source category.

7. Other (Miscellaneous Processes)

There are no VOC or NO_x emissions from this source category.

⁸¹ South Coast AQMD, List of Certified Catalytic Oxidizers. <https://www.aqmd.gov/docs/default-source/permitting/product-certification/charbroilerscatalysts.pdf?sfvrsn=0>

⁸² South Coast AQMD, Proposed Amended Rule 1138. <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1138>

⁸³ South Coast AQMD, 2012 Annual PM2.5 Plan (June 7, 2024). [https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-\(sip\)-revisions/2012-annual-pm2-5-plan](https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan)

Indirect Source Rules

a. Overview

An indirect source is defined in Clean Air Act Section 110(a)(5)(C) as “...a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution.” The Clean Air Act provides that any state may include in a SIP, but the U.S. EPA may not require as a condition of approval of such SIP, any indirect source review program. The U.S. EPA may approve and enforce, as part of an applicable implementation plan, an indirect source review program which the State chooses to adopt and submit as part of its plan. However, U.S. EPA may not require an indirect source review program as a condition of approval of such plan.

South Coast AQMD has adopted three indirect source rules, Rule 2202 On-Road Motor Vehicle Options, Rule 2305 Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, and Rule 2306 –Freight Rail Yards. Rule 2202 applies to employers with more than 250 employees at a worksite, and provides multiple options to reduce emissions from employee commute trips. Options include allowing worksites to develop and implement a rideshare program to meet an average vehicle ridership target, purchasing credits from credit vendors to meet an emission reduction goal, or paying a mitigation fee that funds a variety of emission reduction projects. Allowable strategies include reducing emissions (e.g., encouraging zero emission vehicles) or reducing trips (e.g., carpooling, parking cash-out). South Coast AQMD recently amended Rule 2202 to collect data on recent changes in teleworking patterns after the COVID-19 pandemic, along with other minor amendments. This additional data will inform a potential future amendment to Rule 2202.

Rule 2305 applies to warehouses greater than 100,000 square feet, and provides warehouse operators multiple options to reduce emissions or to facilitate emission reductions from mobile sources associated with their warehouse. Rule 2305 establishes a menu-based points system that requires warehouse operators to annually earn a specified number of points by completing actions from a menu. Menu items include acquiring or using: low NO_x and/or Zero Emissions (ZE) on-road trucks, ZE cargo handling equipment, ZE charging/fueling infrastructure, solar panels, or particulate filters for nearby sensitive land uses. Alternatively, warehouse operators could prepare and implement a custom plan specific to their site, or they could pay a mitigation fee. Funds from the mitigation fee will be used to incentivize the purchase of low NO_x or ZE trucks and ZE charging/fueling infrastructure in the communities near warehouses that paid the fee.

Rule 2306 applies to owners or operators of proposed, new, and existing freight rail yards located within the South Coast AQMD jurisdiction. Rule 2306 establishes emission reduction targets to ensure that NO_x reductions from freight rail yards within the South Coast AQMD jurisdiction will be achieved at levels that are proportional or more-than-proportional to reductions throughout California from implementation of state regulations affecting freight rail yard emission sources. Rule 2306 further requires facility-reporting on zero emission infrastructure, and for non-federal public agencies to include Rule 2306 compliance requirements in contracting with a freight rail yard owner or operator. Rule 2306 does not go into effect

until U.S. EPA grants an authorization under Clean Air Act Section 209(e)(2) to the California In-Use Locomotive Regulation (CCR, Title 13, Sections 2478 through 2478.17). On January 13, 2025, CARB withdrew its application to U.S. EPA seeking authorization under Clean Air Act Section 209(e)(2) to the California In-Use Locomotive Regulation. Thus, Rule 2306 is not currently in effect.

As of January 2025, South Coast AQMD is developing an indirect source rule for marine ports which is forecast to be brought to the South Coast AQMD Governing Board for its consideration in October 2025.

The only other indirect source program that staff are aware of is Rule 9510 in SJVAPCD, which establishes a mechanism to reduce or offset emissions of NO_x and PM₁₀ from the construction and use of development projects through design features, on-site measures, and off-site measures. The rule requires applicants of certain new development projects to reduce operational and construction equipment NO_x and PM₁₀ emissions by specific percentages, as compared to an unmitigated baseline. The rule also requires applicants to incorporate design features and on-site measures into the development project or pay a mitigation fee for emissions in excess of the requirement. SJVAPCD uses the fees to fund off-site emission reduction projects.

b. Evaluation and Conclusion

U.S. EPA approved Rule 2305 into the SIP as a SIP strengthening measure concluding that it has certain deficiencies related to enforceability.⁸⁴ Because of the deficiencies related to enforceability, U.S. EPA concluded that the rule should not be credited in any attainment and rate of progress/reasonable further progress demonstrations. U.S. EPA similarly approved SJVAPCD's Rule 9510 into the SIP as a SIP strengthening measure.⁸⁵ Neither Rule 2202 nor Rule 2306 are currently approved into the SIP. Rule 2202 was disapproved due to allowing Executive Officer discretion for some components of the rule, and for relying on other rules and programs that are not in the SIP.⁸⁶

While indirect source rules provide important mechanisms to facilitate emission reductions, and ultimately result in quantifiable emission reductions, those reductions generally cannot be credited directly to the rule itself. The emission reductions are ultimately quantified in future revisions of statewide mobile source emissions models (e.g., CARB's EMFAC) or through regional transportation modeling (e.g., Southern California Association of Governments Regional Transportation Plan) that look more holistically at mobile

⁸⁴ U.S. EPA, Air Plan Approval; California; South Coast Air Quality Management District, 89 Fed. Reg. 73568 (September 11, 2024). <https://www.federalregister.gov/documents/2024/09/11/2024-20349/air-plan-approval-california-south-coast-air-quality-management-district>

⁸⁵ U.S. EPA, Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District, 75 Fed. Reg. 28509 (May 21, 2010). <https://www.federalregister.gov/documents/2010/05/21/2010-12281/revisions-to-the-california-state-implementation-plan-san-joaquin-valley-unified-air-pollution>; Air Plan Approval; California; San Joaquin Valley Unified Air Pollution Control District; 86 Fed. Reg. 33542 (June 25, 2021). <https://www.federalregister.gov/documents/2021/06/25/2021-13448/air-plan-approval-california-san-joaquin-valley-unified-air-pollution-control-district>

⁸⁶ U.S. EPA, Disapproval of California Air Plan Revisions, South Coast Air Quality Management District, 81 Fed. Reg. 4889 (January 28, 2016). <https://www.federalregister.gov/documents/2016/01/28/2016-01572/disapproval-of-california-air-plan-revisions-south-coast-air-quality-management-district>

source activity and emissions. For similar reasons, U.S. EPA concluded in its FIP for SJVAPCD that an indirect source rule is not an appropriate contingency measure.⁸⁷ We therefore conclude that no contingency measure is feasible for indirect source rules.

Conclusion

The comprehensive evaluation provided in this chapter demonstrates the lack of additional feasible ozone contingency measures for stationary and indirect sources in the South Coast Air Basin. Existing rules generally already implement the most stringent NOx and VOC limits compared to regulations in other jurisdictions, U.S. EPA's RBLC, Control Techniques Guidelines, and other guidance documents. Further reductions would necessitate costly and time-intensive retrofits that exceed the two-year implementation window required for contingency measures or are otherwise infeasible. In addition, the dominance of mobile source NOx emissions in the Basin limits the potential impact of further stationary source measures. Consequently, staff conclude that all feasible measures have been implemented, and that further opportunities for contingency measures are exhausted.

⁸⁷ U.S. 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)

South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS

CHAPTER 5: PUBLIC PROCESS

Public Process

South Coast AQMD's Mobile Source Committee was briefed on the South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS on April 18, 2025 and the draft plan was released on April 24, 2025 to solicit public review and comments. Staff held a public consultation meeting on May 20, 2025 and meeting materials were posted on South Coast AQMD's website 72 hours prior to the meeting. The written comment period for the South Coast Air Basin Contingency Measure SIP Revision closed on May 30, 2025. A public hearing was held at South Coast AQMD's Governing Board meeting on August 1, 2025. Notification of the public hearing was published in major newspapers in each county. Throughout the process, email updates were sent to interested parties.

Written Comments and Responses to Comments

One comment letter was received on the Draft South Coast Ozone Contingency SIP Revision and a response is provided below.

Comment Letter #1



VIA ELECTRONIC MAIL

June 2, 2025

Dr. Sang-Mi Lee, Ph.D.
 Planning and Rules Manager
 South Coast Air Quality Management District
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 Diamond Bar, CA 91765
 Email: slee@aqmd.gov
AQMDteam@aqmd.gov

Re: Comments on Draft South Coast Ozone Contingency SIP Revision

I write comment on the South Coast Air Quality Management District's (Air District) Draft South Coast Ozone Contingency SIP Revision (Draft Plan) currently under review, and to express serious concerns about the agency's ability to address its attainment deficit stemming from past planning failures. We simply cannot accept the Air District's claim that it has already implemented all "feasible measures" as part of this round of contingency planning. The current proposal not only repeats the same flawed approach that contributed to the South Coast Air Basin's ("Air Basin") failure to attain the 1997 8-hour ozone standard, but it also repeats a familiar pattern of ignoring past planning failures that will undoubtedly jeopardize future attainment of the 2015 8-hour Ozone Standard currently being assessed as part of this plan.

Air planning plays a critical role in attaining ozone standards, and the events that trigger contingency measures under the Plan make the consequences of not getting strong enough measures even more dire for the breathing public. Section 172(c)(9) of the Clean Air Act (CAA) requires that "specific measures be undertaken if the air fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date." Considering past planning failures, this plan falls short of delivering the necessary measures, and it must be amended to account for stronger commitments to emissions reductions that are now necessary.

The Air District Has Not Implemented All Feasible Measures

While this contingency measure plan is important, we cannot ignore the gaping hole in air planning left behind by the District's failure to achieve a valid Contingency Measure plan to address the region's continued use of Section 182(e)(5) "Black Box" measures. For years, advocates have warned against the District's reliance on "Black Box" measures—a regulatory placeholder that has failed by delaying tough decisions and relying on federal action or future

Comment
1-1

Comment
1-2

June 2, 2025

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technologies to close the emissions reduction gaps. We know now that those reductions never materialize, nor can we count on federal actions. At the same time, critical rules and valid control measures have languished, largely due to coordinated misinformation campaigns by polluters and delays designed to derail the agency's ability to protect the public.

Comment
1-2 Cont'd

We need look no further than Proposed Rule 2304- The Indirect Source Rule (ISR)—Commercial Marine Ports for an example. While the District has known for decades that more action is needed to address emissions, particularly port-derived NOx emissions, and that an indirect source rule would offer the strongest solution, a Ports ISR remains unfinished after more than four years of official rulemaking. This speaks directly to the current Plan's credibility and the Air District's claim that there are no additional unimplemented feasible measures. There are—the District has simply chosen not to pursue them with the type of urgency required.

Comment
1-3

To that end, we urge the Air District to do the following:

- **Finalize and adopt an Indirect Source Rule for Commercial Marine Ports** that goes beyond infrastructure planning and sets enforceable emission reduction targets to reduce emissions across the port complex.
- **Adopt Strong Zero-NOx emission rules for residential and commercial appliances** with the aim of phasing out NOx-emitting fossil fuel-based units.
- **Expedite Implementation Timelines** for rules driving zero-emission technologies to meet the urgency of the moment while prioritizing equity programs and support needed to ensure all Air Basin residents benefit from the deployment of zero-emission technology.
- **Amend general conformity requirements** to push federally funded projects to achieve real, quantifiable emissions reductions.
- **Adopt zero-emission standards** for all remaining large combustion sources without further delay.
- **Implement previously “shelved” measures** from the 2016 and 2022 Air Quality Management Plans that were abandoned under the farce that the District had met its “global tonnage commitment.”

Comment
1-4

Comment
1-5

Comment
1-6

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1-7

Comment
1-8

These stronger measures must be pursued to address the gap left by black box measures. The Air District is currently out of compliance with its Section 185(e)(5) obligations and has yet to address the 108 tpd attainment gap left in the wake of a failed “Black Box” contingency measure plan. The District cannot simply move on to the next standard while ignoring this gap, as the current plan proposes. Doing so is the definition of backsliding.

Comment
1-9

The Air District Must Develop Stronger Contingency Measures

The Draft Plan for the 2018 8-hour ozone standard under Section 182(c)(9) can still be improved. This plan offers an opportunity to strengthen compliance—but only if the District commits to

Comment
1-10

June 2, 2025

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correcting the policy mistakes that have thwarted rulemaking in the past and created unnecessary regulatory off-ramps.

Consider Rules 1111 and 1121, currently undergoing rulemaking for revision. The rules address NOx pollution from certain furnaces and water heaters. As currently proposed, the rules would offer an alternative compliance pathway—allowing manufacturers to comply by incrementally increasing the share of zero-NOx units over the next twelve years, but never fully reaching 100% zero-emissions. That kind of incremental regulatory design—one that allows for ongoing pollution indefinitely—is a prime candidate for swifter action when the region fails to attain a standard.

Comment
1-10 Cont'd

Automatically closing regulatory loopholes and disrupting gradualism when the region has failed to attain a standard is precisely what the contingency plan should offer. This would prompt the Air District to act decisively and with the urgency that attainment failures require. We recommend that the District use contingency measure planning to review any alternative compliance pathway that prolongs the use of polluting technologies and instead requires a full transition to zero-emissions once the plan is triggered. This is especially urgent in the wake of the region's ever-expanding nonattainment woes and concomitant public health crisis.

Conclusion

Communities in the South Coast Air Basin cannot afford half-measures as part of contingency planning. The Air District must be fully accountable for its contingency planning requirements, and that includes addressing the gaps left by the failed black box plan. We need contingency plans to result in real actions that ideally would never become necessary if the Air District were to deliver on its promises to secure a zero-emissions future through focused rulemaking.

Comment
1-11

Sincerely,

Fernando Gaytan

Senior Attorney

Earthjustice

David Pettit

Senior Attorney

Center for Biological Diversity

CC: Chair Vanessa Delgado

Email: vdelgado@aqmd.gov

Wayne Nastri, Executive Officer

Email: wnastri@aqmd.gov

Response to Comment 1-1: South Coast AQMD appreciates the comment letter from Earthjustice and the Center for Biological Diversity regarding the Draft South Coast Air Basin Contingency Measure SIP Revision. As explained in Chapter 1, the 2022 AQMP contains the strategy to meet the 2015 ozone standard by 2037. The South Coast Air Basin Contingency Measure SIP Revision does not alter the attainment strategy outlined in the 2022 AQMP and therefore it does not “jeopardize future attainment” of the standard.

The purpose of the South Coast Air Basin Contingency Measure SIP Revision is to address contingency measure requirements under CAA sections 172(c)(9) and 182(c)(9) for the 2015 ozone standard in the Basin. Contingency measures have specific criteria that differ from the criteria for control measures included in the 2022 AQMP. As explained in U.S. EPA’s guidance, contingency measures are emissions control requirements that would only take effect upon qualifying future events, such as if the Basin fails to attain a standard by the attainment date or fails to make reasonable further progress. Contingency measures must be adopted into rules that contain automatic triggering mechanisms and they must be able to be implemented and achieve emission reductions within up to two years of a triggering event. Most importantly, contingency measures cannot rely on control measures needed for attainment.

South Coast AQMD staff developed the South Coast Air Basin Contingency Measure SIP Revision to be consistent with U.S. EPA’s guidance, which requires a robust justification since the adopted contingency measures for the Basin achieve less than the recommended quantity of emission reductions. As presented in Chapter 4, staff performed an extensive evaluation of over 180 rules in other air districts, states, and federal regulations and did not identify any more stringent provisions that could be implemented as contingency measures. This extensive analysis supports the conclusion that all contingency measures feasible at the time of developing this SIP revision have been adopted.

Response to Comment 1-2: Contingency measure requirements under CAA sections 172(c)(9) and 182(c)(9) differ from the requirement for a contingency measure plan under CAA section 182(e)(5). This SIP revision addresses requirements under CAA sections 172(c)(9) and 182(c)(9), not CAA section 182(e)(5). Areas that are classified as “extreme” nonattainment for ozone are allowed to rely on CAA section 182(e)(5) “black box” measures that depend on the deployment of future advanced technologies. Three years prior to the attainment date, these areas must submit a contingency measure plan showing how the “black box” reductions will be achieved, or provide contingency measures in case advanced technologies do not deliver the expected reductions. The 2022 AQMP attainment strategy relied on 61 tons per day of NO_x reductions from “black box” measures to meet the 2015 ozone standard by 2037. South Coast AQMD will submit a contingency measure plan to U.S. EPA addressing CAA section 182(e)(5) requirements by December 31, 2033. This submission is entirely separate from this South Coast Air Basin Contingency Measure SIP Revision.

Response to Comment 1-3: Staff is currently pursuing a measure related to ports, including Proposed Rule (PR) 2304, an Indirect Source Rule (ISR) for Commercial Marine Ports. A public hearing to consider adoption of PR 2304 is currently anticipated for the 4th quarter in 2025, subject to change. This potential action is focused on alternative fueling and charging infrastructure, which can be relied on by future control measures that would be developed at the federal, state, or local level. PR 2304 is being developed

through a robust public process. Alternative fueling and charging infrastructure can take many years to plan and develop and thus is not suited as a contingency measure triggered by a qualifying event. In addition, zero-emission vehicles and engines must be commercially available to be mandated within 60 days and to achieve emission reductions within two years of a triggering event. However, such transitions—especially when accounting for necessary infrastructure—require significantly longer implementation timelines than those specified for contingency measures. Thus, PR 2304 would not qualify as contingency measure.

Response to Comment 1-4: While the 2022 AQMP calls for a transition to zero emission technologies across all sectors wherever feasible, rules mandating phase out of combustion appliances would not qualify as contingency measures under U.S. EPA’s guidance. Contingency measures must take effect within 60 days of a triggering event and achieve emission reductions within two years. However, manufacturers require lead time to scale up production of zero-emission appliances to meet market demand. In addition, the infrastructure needed to support increased electrical load requires long-term planning and coordination with other agencies and utility providers to ensure grid stability and sufficient capacity. Therefore, mandates for zero-emission appliances are not viable as contingency measures.

Response to Comment 1-5: The attainment strategy set forth in the 2022 AQMP calls for a broad, economy-wide transition to zero emission technologies across all sources. To implement the strategy, as part of the rulemaking process, staff conduct a robust Best Available Retrofit Control Technology (BARCT) analysis to assess technological and economic feasibility of zero NOx emission limits. Staff also consider equity to ensure that all residents benefit from the technologies.

Some rules, including Rules 1153.1 - Emissions of Oxides of Nitrogen from Commercial Food Ovens and 1146.2 - Control of Oxides of Nitrogen from Large Water Heaters, Small Boilers and Process Heaters, have already been amended to introduce zero NOx limits. The emission reductions from Rules 1153.1 and 1146.2 are relied upon for attainment and, therefore, the zero NOx limits cannot be withheld to satisfy contingency measure requirements. In addition, other factors preclude adoption of zero NOx limits as contingency measures for stationary sources. For example, manufacturers need lead time to scale up production of zero emission appliances and equipment to satisfy market demand. Further, some stationary sources require additional time to design, purchase, install, and operate zero emission equipment. These processes would take longer than the timeframe specified in U.S. EPA’s guidance – 60 days for the measure to take effect and up to two years to achieve reductions. Therefore, it would not be feasible to implement a zero emission requirement as a contingency measure.

Response to Comment 1-6: As part of the attainment strategy in the 2022 AQMP, South Coast AQMD committed to implement control measure EGM-02 - Emission Reductions from Projects Subject to General Conformity Requirements to address general conformity and establish requirements for the emission increases to be offset or mitigated. South Coast AQMD will implement EGM-02 through a public process as early as possible. Because it is included in the attainment strategy, EGM-02 cannot be held in reserve to fulfill contingency measure requirements.

Response to Comment 1-7: As part of the attainment strategy in the 2022 AQMP, South Coast AQMD committed to transition large stationary sources to zero emissions (e.g., control measures L-CMB-02 - Reductions from Boilers and Process Heaters, L-CMB-03 - NO_x Emission Reductions from Permitted Non-Emergency Internal Combustion Engines, L-CMB-04 - Emission Reductions from Emergency Standby Engines, etc.). However, as explained in Response to Comments 1-4 and 1-5, zero emission limits are not feasible as contingency measures due to implementation constraints.

Response to Comment 1-8: Nearly all stationary source control measures in the 2016 AQMP with quantified emission reductions have been implemented through rule amendments or incentive projects as shown in Table 5-1. The only remaining measure is CMB-04 - Emission Reductions from Restaurant Burners and Residential Cooking. This control measure has been carried over into the 2022 AQMP as two control measures: R-CMB-03 - Emissions Reductions from Residential Cooking Devices and C-CMB-03 - Emission Reductions from Commercial Cooking Devices. South Coast AQMD is committed to implementing these measures through a combination of regulatory approaches and incentive programs. No control measures have been “shelved” or abandoned and all other measures in the 2022 AQMP will continue to be implemented. Regardless, these control measures are committed for attainment and, therefore, they cannot be used as contingency measures.

TABLE 5-1
STATIONARY SOURCE CONTROL MEASURES FOR OZONE IN THE 2016 AQMP WITH QUANTIFIED REDUCTIONS

2016 AQMP Control Measure	2023 NOx reductions (tpd)	2023 VOC reductions (tpd)	Implementing Rule(s) (Amendment Date) or 2022 AQMP control measure(s)
CMB-01 - Transition to Zero and Near-Zero Emission Technologies for Stationary Sources	2.5	1.2	Rules 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters (12/7/18)
CMB-02 - Emission Reductions from Replacement with Zero or Near-Zero NOx Appliances in Commercial and Residential Applications	1.1	-	Proposed Amended Rules 1111 - Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces (9/1/23) and 1121 - Control of Nitrogen Oxides from Residential Type, Natural-Gas-Fired Water Heaters (9/3/04)
CMB-03 - Emission Reductions from Non-Refinery Flares	1.4	0.4	Rule 1118.1 - Control of Emissions from Non-Refinery Flares (1/4/19)
CMB-04 - Emission Reductions from Restaurant Burners and Residential Cooking	0.8	-	R-CMB-03 - Emissions Reductions from Residential Cooking Devices and C-CMB-03 - Emission Reductions from Commercial Cooking Devices
CMB-05 - Further NOx Reductions from RECLAIM Assessment*	0.0	-	Rule 1109.1 - Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations (11/5/21); Rule 1110.2 – Emissions from Gaseous- and Liquid- Fueled Engines (11/1/19); Rule 1117 - Emissions from Container Glass Melting and Sodium Silicate Furnaces (6/5/24); Rule 1118.1 (1/4/19); Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines (4/5/19); Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (11/2/18); Rule 1146 series (12/7/18); Rule 1147 – NOx Reductions from Miscellaneous Sources (5/6/22); Rule 1147 – NOx Reductions from Miscellaneous Sources (5/6/22); Rule 1147.1 – NOx

2016 AQMP Control Measure	2023 NOx reductions (tpd)	2023 VOC reductions (tpd)	Implementing Rule(s) (Amendment Date) or 2022 AQMP control measure(s)
			Reductions from Aggregate Dryers (8/6/21); Rule 1147.2 – NOx Reductions from Metal Melting and Heating Furnaces (4/1/22); Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens (8/4/23); and Rule 1159.1 – Control of NOx Emissions from Nitric Acid Tanks (12/6/24)
ECC-02 - Co-Benefits from Existing Residential and Commercial Building Energy Efficiency Measures	0.3	<0.1	Co-benefits achieved from implementation of the Clean Energy Pollution Reduction Act of 2015 (SB 350); and ECC-02 - Co-Benefits from Existing and Future Residential and Commercial Building Energy Efficiency Measures
ECC-03 - Additional Enhancements in Reducing Existing Residential Building Energy Use	1.2	0.2	Two incentive projects implemented; and ECC-03 - Additional Enhancements in Reducing Existing Residential Building Energy Use
BCM-10 - Emission Reductions from Greenwaste Composting	-	1.5	Proposed Amended Rule 1133 – Composting and Related Operations (scheduled for adoption on September 5, 2025)
FUG-01 - Improved Leak Detection and Repair	-	2.0	Rule 463 - Organic Liquid Storage (6/7/24) Rule 1148.1 - Oil and Gas Production Wells (8/2/24) Rule 1173 - Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (11/1/24) Rule 1178 - Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities (9/1/23)
CTS-01 - Further Emission Reductions from Coatings, Solvents, Adhesives, and Sealants	-	1.0	Rule 1168 - Adhesive and Sealant Applications (10/6/17)

* While CMB-05 did not commit any reductions in 2023, 5 tpd of NOx reductions were committed by 2025.

Response to Comment 1-9: As noted in previous responses, the South Coast Ozone Contingency SIP Revision was developed to address contingency measure requirements under CAA sections 172(c)(9) and 182(c)(9). This effort is entirely separate from the CAA section 182(e)(5) contingency measure plan for the 2015 ozone standard that South Coast AQMD must submit to U.S. EPA by December 31, 2033. Nevertheless, South Coast AQMD remains fully committed to achieving all federal air quality standards as expeditiously as possible.

Response to Comment 1-10: The South Coast AQMD Governing Board directed Proposed Amended Rules 1111 and 1121 back to Committee for further review. As explained in Response to Comment 1-4, these rules cannot serve as viable contingency measures.

Response to Comment 1-11: South Coast AQMD appreciates your comments and remains committed to improving air quality and protecting public health in the South Coast Air Basin and Coachella Valley through feasible and innovative control strategies.

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

**CHAPTER 6: CALIFORNIA ENVIRONMENTAL QUALITY
ACT AND SOCIOECONOMIC IMPACT ASSESSMENT**

California Environmental Quality Act (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Sections 15002(k) and 15061, the proposed project (South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS) is exempt from CEQA pursuant to CEQA Guidelines Sections 15061(b)(3) and 15308. Further, there is no substantial evidence indicating that the exceptions set forth in CEQA Guidelines Section 15300.2 apply to the proposed project. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062, and if the proposed project is approved, the Notice of Exemption will be filed for posting with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino Counties, and with the State Clearinghouse of the Governor's Office of Land Use and Climate Innovation.

Socioeconomic Impact Assessment

No Socioeconomic Impact Assessment is required pursuant to Health and Safety Code Section 40440.8 or 40728.5 because these sections apply only to rules. Further, no socioeconomic impact will result from the proposed project.

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

CHAPTER 7: STAFF RECOMMENDATION

Staff Recommendation

Staff recommends adoption of the South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS and subsequent submission to U.S. EPA via CARB.

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

**APPENDIX A: CALIFORNIA SMOG CHECK CONTINGENCY
MEASURE STATE IMPLEMENTATION PLAN REVISION**

California Smog Check Contingency Measure State Implementation Plan Revision

Released: September 15, 2023



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Executive Summary

The *California Smog Check Contingency Measure State Implementation Plan Revision* (Measure) addresses State Implementation Plan (SIP) contingency measure requirements of the federal Clean Air Act (Act) for certain areas designated as nonattainment of the national ambient air quality standards (NAAQS or standards) within the State. This Measure is necessary to address contingency measure requirements and respond to recent court actions to meet statutory deadlines related to contingency measures. This Measure includes an action that is triggered if a nonattainment area fails to attain by the applicable attainment date, fails to meet a reasonable further progress (RFP) milestone, fails to meet a quantitative milestone, or fails to submit a required quantitative milestone report or milestone compliance demonstration (collectively referred to as “Triggering Events”).

The Motor Vehicle Inspection and Maintenance Program (Smog Check Program) is a vehicle inspection and maintenance program administered by the California Bureau of Automotive Repair (BAR) that identifies vehicles with faulty emission control components. Smog Check inspections are required biennially as a part of the vehicle registration process and/or when a vehicle changes ownership or is registered for the first time in California. In 2017, Assembly Bill (AB) 1274 added Health and Safety Code (H&SC) § 44011(a)(4)(B)(ii) which allowed vehicles eight or less model-years old to be exempt from requirements for Smog Check inspections. In lieu of an inspection, this law requires seven and eight model-year old vehicles owners to pay an annual Smog Abatement Fee of \$25, \$21 of which goes to the Air Pollution Control Fund for use to incentivize clean vehicles and equipment through the Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program). This law also specifies that this exemption is allowed unless CARB determines that exempting these vehicles prohibits the State from meeting SIP commitments. At that time, the AB 1274 analysis¹ indicated that the emissions reductions from the increase in funding to the Moyer Program would outweigh the benefits of requiring seven and eight model-year old vehicles to obtain a Smog Check inspection.

CARB staff has now determined that removal of these exemptions may be needed to meet the contingency measure SIP requirements. CARB staff has also determined that in all of the relevant nonattainment areas, requiring a Smog Check inspection on eight model-year old vehicles provides more emission reductions than the potential loss in Moyer Program emission reductions that would result from the foregone funding. In 2017, when AB 1274 enacted this change in Smog Check exemptions, the benefit from additional funding for Moyer Program projects was estimated to outweigh the disbenefit from exempting additional vehicles. However, since 2017 the Program has successfully incentivized the

¹ *Bill Analysis - AB-1274 Smog check: exemption. (ca.gov)*

turnover of many dirty engines and equipment and Moyer Program projects are now less cost-effective than before, resulting in a net benefit from this Measure.

If a Triggering Event occurs, the Measure would:

- Change the existing smog check inspection exemptions in the California Smog Check Program in the applicable nonattainment area(s);
- Apply to the California nonattainment area(s) and standard(s) for which the Triggering Event occurs, from those listed on the next page in Table 1.; and
- Be implemented within 30 days of the effective date of a U.S. EPA finding that a Triggering Event occurred.

Seven areas in California under State jurisdiction are designated as nonattainment for the 75 parts per billion (ppb) 8-hour ozone standard, and ten areas in California under State jurisdiction are designated as nonattainment for the 70 ppb 8-hour ozone standard, with classifications of Moderate, Serious, Severe or Extreme. Additionally, the San Joaquin Valley is designated as nonattainment for the 80 ppb 8-hour ozone standard, the 12 microgram per meter cubed ($\mu\text{g}/\text{m}^3$) annual, 15 $\mu\text{g}/\text{m}^3$ annual, and 35 $\mu\text{g}/\text{m}^3$ 24-hour PM_{2.5} standards. The South Coast Air Basin is also designated as nonattainment for the 12 $\mu\text{g}/\text{m}^3$ annual PM_{2.5} standard. For all of these standards, nonattainment areas were or will be required to submit SIP revisions meeting contingency measure and other applicable requirements of the Act.

CARB staff has worked with local air districts to prepare contingency measure SIP revisions which were adopted and submitted to the U.S. Environmental Protection Agency (U.S. EPA) through CARB. Further, in 2018, CARB staff submitted the [*2018 Updates to the California State Implementation Plan*](#) (2018 SIP Update) which included a statewide contingency measure that was developed following U.S. EPA guidance available at the time. However, multiple lawsuits challenging U.S. EPA's interpretation of the Act led to U.S. EPA's determination that the previously submitted 2018 SIP Update contingency measures did not fully meet the Act's requirements. CARB staff is now proposing to submit the Measure to be consistent with U.S. EPA's current interpretation of the contingency measure provisions of the Act. The Measure as included in this SIP revision will be applicable for the California nonattainment areas and standards as listed in Table 1.

Table 1. Nonattainment Areas and Applicable Standards

Area	Applicable Standards
Coachella Valley	70 ppb Ozone, 75 ppb Ozone
Eastern Kern County	70 ppb Ozone, 75 ppb Ozone
Mariposa County	70 ppb Ozone
Sacramento Metro Area	70 ppb Ozone, 75 ppb Ozone
San Diego County	70 ppb Ozone, 75 ppb Ozone
San Joaquin Valley	70 ppb Ozone, 75 ppb Ozone, 80 ppb Ozone, 15 µg/m ³ PM2.5, 35 µg/m ³ PM2.5, 12 µg/m ³ PM2.5
South Coast Air Basin	12 µg/m ³ PM2.5, 70 ppb Ozone, 75 ppb Ozone
Ventura County	70 ppb Ozone
Western Mojave Desert	70 ppb Ozone, 75 ppb Ozone
Western Nevada	70 ppb Ozone

CARB staff initiated the public process with release of a concept document and workshop in August 2023 to solicit input from the public. The concept document and other materials were available in English and Spanish, and the workshop provided a forum in both English and Spanish for the proposed Measure to be discussed in a public setting and provide additional opportunity for public feedback, input, and ideas. CARB staff also analyzed the impacts of the Measure on vehicle owners in disadvantaged communities (DACs). CARB staff compared the proportion of the vehicles subject to the Measure if triggered to those registered in DACs to the proportion of vehicles subject to the Measure in total using DMV data. CARB staff found that, in all nonattainment areas, the proportion of vehicle owners potentially impacted by the Measure, if triggered, is not disproportionate to the population as a whole.

CARB staff has determined that the Measure meets the Act contingency measure requirements and that exercising H&SC § 44011(a)(4)(B)(ii) is needed to meet the SIP requirements.

Further, CARB staff last submitted updates to the Smog Check Program to U.S. EPA for incorporation into the California SIP in 2009 and U.S. EPA approved them on July 1, 2010.² As previously mentioned, the additional exemptions from the Smog Check Program were made by AB 1274 in 2017. As a part of this SIP revision, CARB staff is submitting H&SC § 44011(a)(4)(A) and (B) into the California SIP to incorporate these changes in the Smog Check Program.

The Board is scheduled to consider the Measure on October 26, 2023. CARB staff recommends the Board to adopt the Measure addressing contingency measure requirements for the applicable standards and nonattainment areas as listed in Table 1 and approve submittal into the California SIP of California H&SC sections 44011(a)(4)(A) and (B). If adopted, CARB staff will submit the Measure and H&SC sections 44011(a)(4)(A) and (B) to U.S. EPA as a revision to the California SIP.

² 75 Fed. Reg. 38023 (July 1, 2010)

Section 1. Contingency Requirements and Litigation

The Clean Air Act ("Act") 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 (RFP), or to attain the national primary ambient air quality standard by the attainment date...."³ The Act is silent though on the specific level of emission reductions that must flow from contingency measures. In the absence of specific requirements for the amount of emission reductions, in 1992, U.S. 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 (57 Federal Register 13510, 13512 (April 16, 1992)). While U.S. EPA's ozone guidance states "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", U.S. EPA has accepted contingency measures that equal less than one year's worth of RFP in some situations. Specifically, U.S. EPA has historically accepted lesser amounts as they see appropriate considering "U.S. 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.'"⁴

In recent years, court decisions, as described below, have excluded a category of contingency measures from what U.S. EPA may properly approve. Historically, U.S. EPA allowed contingency measure requirements to be met via excess emission reductions from ongoing implementation of adopted emission reduction programs. In the past, CARB used this method to meet contingency measure requirements. In 2016, in *Bahr v. U.S. Environmental Protection Agency*⁵ (*Bahr*), the Ninth Circuit determined U.S. EPA erred in approving a contingency measure that relied on an already-implemented measure for a nonattainment area in Arizona, thereby rejecting U.S. EPA's longstanding interpretation of section 172(c)(9) of the Act. U.S. EPA staff interpreted this decision to mean that contingency measures must include a future action triggered by a Triggering Event. This decision was applicable to only the states covered by the Ninth Circuit. In the rest of the country, U.S. EPA still allowed contingency measures using their pre-Bahr stance. In January 2021, in *Sierra Club v. Environmental Protection Agency*⁶, 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*).

³ 42 U.S.C. § 7502(c)(9).

⁴ See, e.g. 78 Fed.Reg. 37741, 37750 (Jun. 24, 2013), approval finalized with 78 Fed.Reg. 64402 (Oct. 29, 2013).

⁵ *Bahr v. U.S. Environmental Protection Agency*, (9th Cir. 2016) 836 F.3d 1218.

⁶ *Sierra Club v. Environmental Protection Agency*, (D.C. Cir. 2021) 985 F.3d 1055.

In response to *Bahr* and as part of the 75 ppb 8-hour ozone SIPs due in 2016, CARB staff 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 a part of the contingency measure requirement. CARB staff worked closely with U.S. EPA regional staff in developing the contingency measure package that included the triggered Enforcement Contingency Measure, a district triggered measure and emission reductions from implementing 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, U.S. EPA wrote in their final approval that the Enforcement Contingency Measure did not satisfy requirements to be approved as a "standalone contingency measure" and approved it only as a "SIP strengthening" measure⁷. U.S. EPA did approve the San Joaquin Valley Air Pollution Control 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 Irrigated Residents filed a lawsuit against the U.S. EPA for its 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 Irrigated Residents v. EPA*⁸ (*AIR*) that U.S. 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 U.S. 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 Act's contingency measure requirements must come from the contingency measure itself. The Ninth Circuit also said that the amount of reductions needed for contingency should not be reduced absent U.S. EPA adequately explaining its change from its historic stance on the amount of reductions required. U.S. EPA staff has interpreted *AIR* to mean that triggered contingency measures must achieve the entirety of the amount of emission reductions needed for the contingency measure requirement on their own. In addition, surplus emission reductions from ongoing programs cannot reduce the amount of reductions needed for the contingency measure requirements.

In response to *Bahr* and *Sierra Club*, in 2021, U.S. EPA convened a nationwide internal task force to develop guidance to support states in their development of contingency measures. The draft guidance was released in March 2023 and is currently undergoing a public review process. The draft guidance proposes a new method for how to calculate one year's worth of progress for the targeted amount of contingency measures reductions and provides new clarification on the reasoned justification U.S. EPA requires to facilitate approval of contingency measures with lesser amounts of reductions. Per the draft guidance, such a

⁷ 87 Fed. Reg. 59688 (October 3, 2022)

⁸ *Association of Irrigated Residents v. U.S. Environmental Protection Agency*, (9th Cir. 2021) 10 F.4th 937

reasoned justification would need to include an infeasibility analysis detailing why there are insufficient measures to meet one year's worth of progress. U.S. EPA relied on the draft guidance when they proposed a federal implementation plan to meet the PM2.5 contingency measure requirements in the San Joaquin Valley on August 8, 2023⁹.

Section 2. CARB's Opportunities for Contingency Measures

Much has changed since U.S. EPA's 1992 guidance on contingency measures. Control programs across the country have matured as have the health-based standards. U.S. EPA strengthened ozone standards in 1997, 2008 and 2015 with attainment dates out to 2037 for areas in "extreme" nonattainment. California has the only three extreme ozone nonattainment areas in the country for the 2015 ozone NAAQS. Extreme ozone nonattainment areas are allowed to use a provision in the Act where emission reduction measures can wait for technology to advance. California also has multiple PM2.5 nonattainment areas with the highest possible classification and greatest attainment challenges. Thus, control measures are needed for meeting the NAAQS as expeditiously as possible, rather than being held in reserve.

To address contingency measure requirements given the courts' decisions and U.S. EPA's draft guidance, CARB staff and local air districts would need to develop a measure or measures that, when triggered by a Triggering Event, will achieve one year's worth of progress for the given nonattainment area unless it is determined that it is infeasible to achieve one year's worth of emission reductions. Given CARB's wide array of mobile source control programs, the relatively limited portion of emissions primarily regulated by the local air districts, and the fact that primarily-federally regulated sources are expected to account for approximately 52 percent of statewide nitrogen oxides (NOx) emissions by 2037¹⁰, finding triggered measures that will achieve the required reductions is nearly impossible. That said, even discounting the amount to reflect the proportion of sources that are primarily federally regulated, additional control measures that can be identified by CARB staff are scarce or nonexistent that would achieve the required emissions reductions needed for a contingency measure.

Adding to the difficulty of identifying available control measures, not only does the suite of contingency measures need to achieve a large amount of reductions, but they will also need to achieve these reductions in the year following the year in which the Triggering Event has been identified. Although the newly released draft guidance proposes allowing for up to two years to achieve those reductions, control measures achieving the level of reductions required often take more than two years to implement and will likely not result in immediate reductions. In California's 2022 State SIP Strategy, CARB's three largest NOx reduction

⁹ 88 Fed. Reg. 53431 (August 8, 2023)

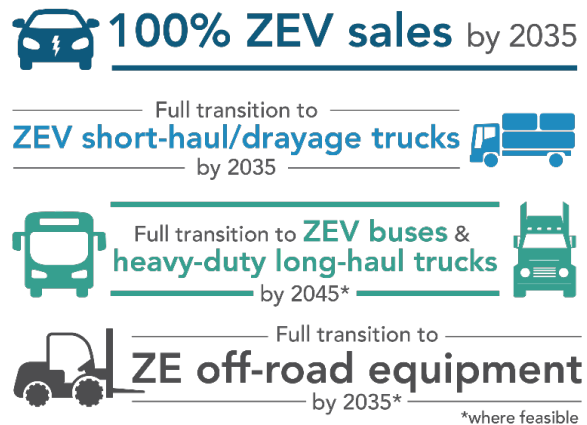
¹⁰ Source: CARB 2022 CEPAM v1.01; based on 2037 emissions totals.

measures, In-Use Locomotive Regulation, Advanced Clean Fleets, and Transportation Refrigeration Unit II, rely on accelerated turnover of older engines/trucks. The need for buildout of potential infrastructure upgrades and market-readiness of new equipment options that meet requirements limits the availability to have significant emission reductions in a short amount of time. Options for a technically and economically feasible triggered measure that can be implemented and achieve the necessary reductions in the time frame required are scarce in California.

CARB has over 50 years of experience reducing emissions from mobile sources like cars and trucks, as well as other sources of pollution under State authority. The Reasonably Available Control Measures for State Sources analysis that CARB included in all of the 70 ppb 8-hour ozone SIPs illustrates the reach of CARB's current programs and regulations, many of which set the standard nationally for other states to follow. Few sources CARB has primary regulatory authority over remain without a control measure, and all control measures that are in place support the attainment of the NAAQS. There is a lack of additional control measures that would be able to achieve the necessary reductions for a contingency measure. Due to the unique air quality challenges California faces, should such additional measures exist, CARB would pursue those measures to support expeditious attainment of the NAAQS and would not reserve such measures for contingency purposes. Nonetheless, CARB staff has continued to explore options for potential statewide contingency measures utilizing its authorities and applying draft guidance.

A central difficulty in considering a statewide contingency measure under CARB's authority, is that CARB is already fully committed to driving sources of air pollution in California to zero-emission everywhere feasible and as expeditiously as possible. In 2020, Governor Newsom signed Executive Order N-79-20 ([Figure 1](#)) that established a first-in-the-nation goal for 100 percent of California sales of new passenger cars and trucks to be zero emission by 2035. The Governor's order also set a goal to transition 100 percent of the drayage truck fleet to zero- emission by 2035, all off-road equipment where feasible to zero -emission by 2035, and the remainder of the medium and heavy-duty vehicles to zero--emission where feasible by 2045.

Figure 1 - Governor Newsom Executive Order N-79-20



California is committed to achieving these goals, and CARB is pursuing an aggressive control program in conjunction with other state and local agencies. CARB's programs not only go beyond emissions standards and programs set at the federal level, but many include zero-emissions requirements or otherwise, through incentives and voluntary programs, that drive mobile sources to zero-emissions, as listed in Table 2 below. CARB is also exploring and developing a variety of new measures to drive more source categories to zero-emissions and reduce emissions even further, as detailed in the 2022 State SIP Strategy. With most source categories being driven to zero-emissions as expeditiously as possible, opportunities for having triggered measure that could reduce NO_x, reactive organic gases (ROG) and PM_{2.5} emissions by the amount required for contingency measures are scarce.

Table 2. Emissions Sources and Respective CARB Programs with a Zero-Emissions Requirement/Component

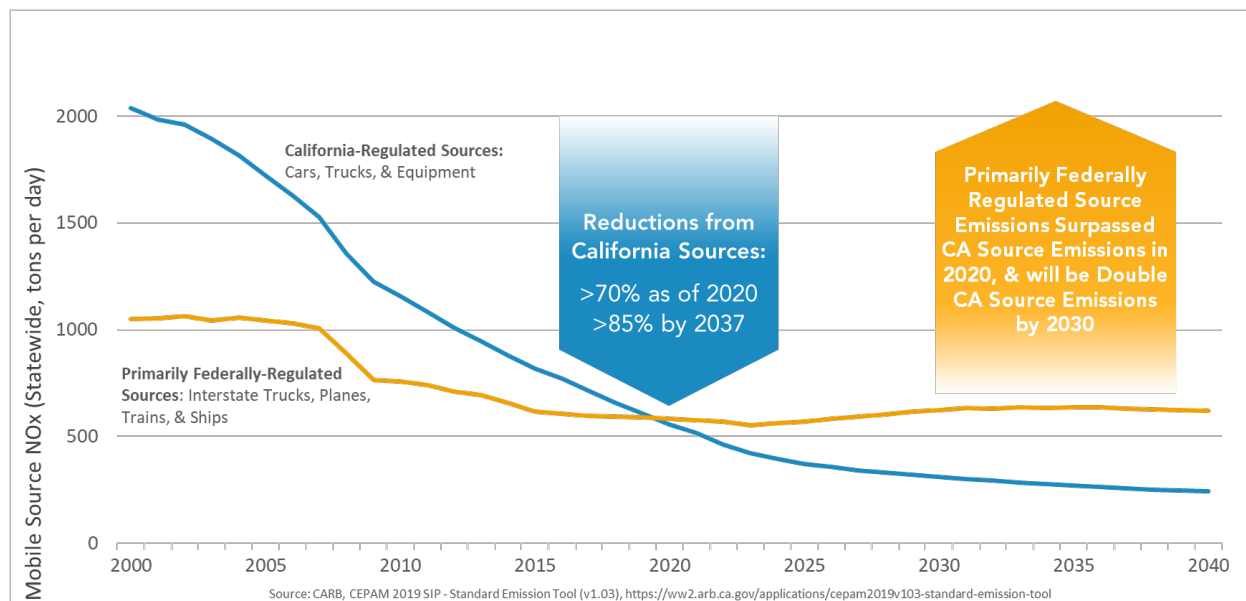
Emission Source	Regulatory Programs
Light-Duty Passenger Vehicles and Light-Duty Trucks	- Advanced Clean Cars Program (I and II), including the Zero Emission Vehicle Regulation - Clean Miles Standard
Motorcycles	On-Road Motorcycle Regulation*
Medium Duty-Trucks	- Advanced Clean Cars Program (I and II), including the Zero Emission Vehicle Regulation - Zero-Emission Powertrain Certification Regulation - Advanced Clean Trucks Regulation - Advanced Clean Fleets Regulation
Heavy-Duty Trucks	- Zero-Emission Powertrain Certification Regulation - Advanced Clean Trucks Regulation - Advanced Clean Fleets Regulation
Heavy-Duty Urban Buses	- Innovative Clean Transit - Advanced Clean Fleets Regulation
Other Buses, Other Buses - Motor Coach	- Zero-Emission Airport Shuttle Regulation - Advanced Clean Fleets Regulation
Commercial Harbor Craft	Commercial Harbor Craft Regulation
Recreational Boats	Spark-Ignition Marine Engine Standards*
Transport Refrigeration Units	Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (Parts I and II*)
Industrial Equipment	- Zero-Emission Forklifts* - Off-Road Zero-Emission Targeted Manufacturer Rule*
Construction and Mining	Off-Road Zero-Emission Targeted Manufacturer Rule*
Airport Ground Support Equipment	Zero-Emission Forklifts*
Port Operations and Rail Operations	- Cargo Handling Equipment Regulation - Off-Road Zero-Emission Targeted Manufacturer Rule*
Lawn and Garden	- Small Off-Road Engine Regulation - Off-Road Zero-Emission Targeted Manufacturer Rule*
Ocean-Going Vessels	At Berth Regulation
Locomotives	In-Use Locomotive Regulation

*Indicates program or regulation is in development

Most air pollution sources in California that are not as well controlled are primarily-federally regulated sources. (Figure 2). This includes interstate trucks, ships, locomotives, aircraft, and certain categories of off-road equipment, constituting a large source of potential emissions reductions. Since these are primarily regulated at the federal and, in some cases,

international level, options to implement a contingency measure with reductions approximately equivalent to one year's worth of progress are limited.

Figure 2 - State vs. Federal Mobile Source NO_x Emissions



CARB staff has analyzed CARB's suite of control measures for all sources under CARB authority to identify potential contingency measure options. CARB currently has programs in place or under development for most sources and have evaluated a variety of regulatory mechanisms within existing and new programs for potential contingency triggers. After conducting a full analysis of measures for contingency measure opportunities, CARB staff determined that changes in the Smog Check Program are appropriate to use to meet the Act contingency measure requirement. The Measure was found to be the most feasible option given timing and technical constraints for adoption and implementation. The full infeasibility analysis can be found in Appendix A. Further, U.S. EPA recently released their own infeasibility analysis¹¹ in which they came to the same conclusion with respect to the scarcity of available contingency measures in CARB's mobile source control programs.

With this proposal, CARB staff would adopt and submit the Measure for the 70 ppb 8-hour ozone, 75 ppb 8-hour ozone, 80 ppb 8-hour ozone, the 12 µg/m³ and 15 µg/m³ annual PM_{2.5}, and 35 µg/m³ 24-hour PM_{2.5} standards for the relevant nonattainment areas to address the contingency measure requirements of the Act as interpreted by U.S. EPA in the draft guidance. The Measure consists of a triggered contingency measure that, if triggered,

¹¹ EPA Source Category and Control Measure Assessment and Reasoned Justification Technical Support Document; Federal Implementation Plan for Contingency Measures for the Fine Particulate Matter Standards; San Joaquin Valley, California. <https://www.regulations.gov/docket/EPA-R09-OAR-2023-0352>

would change the exemptions for motor vehicles in the California Smog Check Program for the relevant local air district and applicable standard as specified in Table 1 that, together with the local air districts' contingency measures, addresses the contingency measure requirements of the Act. A detailed description of the Measure is described in Section 4 below.

Section 3. California Smog Check Program

The Smog Check Program is a vehicle inspection and maintenance program administered by BAR. The Smog Check Program aims to reduce air pollution in the state by identifying vehicles with harmful excess emissions for repair or retirement. While BAR administers the Program, the California Department of Motor Vehicles (DMV) provides the vehicle registration and licensing information to support administration and enforcement of the Smog Check Program. Smog Check inspections are required biennially as a part of the vehicle registration process and/or when a vehicle changes ownership or is registered for the first time in California, depending on the area and severity of the air quality problem. Certain areas with worse air quality issues are subject to an enhanced version of the Program with stricter requirements. All gasoline-powered vehicles, hybrid vehicles, and alternative-fuel vehicles that are model-year 1976 and newer, as well as all diesel vehicles model-year 1998 and newer with a gross-vehicle weight rating of 14,000 pounds and less, are subject to Smog Check inspections.

However, there are several exceptions. Motorcycles and electric-powered vehicles are not subject to the Smog Check Program. Additionally, in 2017, California Assembly Bill (AB) 1274 was enacted, which amended the H&SC to exempt vehicles up to eight model -years old (MYO); previously, vehicles had been exempt up to six MYO. These seven and eight MYO vehicles that would otherwise be subject to a Smog Check inspection must pay an annual Smog Abatement Fee of \$25, \$21 of which goes to the Air Pollution Control Fund for use through the Moyer Program. Per H&SC § 44011(a)(4)(B)(ii), these motor vehicles eight or less MYO are exempted from biennial Smog Check inspection, unless CARB finds that providing an exception for these vehicles will prohibit the state from meeting the state commitments with respect to the SIP.

In 2017, when this change in Smog Check exemptions was enacted, the benefit from additional funding for Moyer Program projects was estimated to outweigh the disbenefit from exempting additional vehicles. However, since 2017, the cost-effectiveness of Moyer Program projects has increased as the program has successfully incentivized the turnover of many dirty engines and equipment. Moyer Program projects are now less cost-effective than before, resulting in a net benefit from this Measure.

As such, the ability to make the relevant finding for H&SC § 44011(a)(4)(B)(ii) purposes is within CARB's authority, and the other State agencies that implement California's Smog Check Program will be bound by it. CARB staff last submitted updates to the Smog Check Program to U.S. EPA for incorporation into the California SIP in 2009 and approved by U.S. EPA on July 1, 2010.¹² As previously mentioned, the additional exemptions from the Smog Check Program were made by AB 1274 in 2017. As a part of this SIP revision, CARB

¹² 75 Fed. Reg. 38023 (July 1, 2010)

staff is also proposing the Board approve submittal of H&SC § 44011(a)(4)(A) and (B) into the California SIP to incorporate these changes in the Smog Check Program. The H&SC sections are included in Appendix D.

Further the Smog Check Program meets federal requirements for an inspection and maintenance (I/M) program. On March 23, 2023, CARB adopted the California Smog Check Performance Standard Modeling (PSM) and Program Certification for the 70 parts per billion (ppb) 8-hour Ozone Standard (Smog Check Certification) to address I/M SIP requirements for the 70 ppb 8-hour ozone standard. CARB staff submitted it to U.S. EPA as a SIP revision. The Smog Check Certification demonstrated that the California's Smog Check Program meets the applicable federal I/M program requirements for all the 70 ppb 8-hour ozone nonattainment areas in California.

Section 4. Smog Check Contingency Measure

The Measure will consist of changing the existing Smog Check inspection exemptions in California's Smog Check Program in any applicable nonattainment area listed in Table 1. that fails to satisfy any one of the following (failures of which are collectively referred to as "Triggering Events"):

- Attain by the applicable attainment date;
- Meet a reasonable further progress (RFP) milestone;
- Meet a quantitative milestone; or
- Submit a required quantitative milestone report or milestone compliance demonstration.

The Measure will be initiated within 30 days of the effective date of a U.S. EPA determination of a Triggering Event. The exemption will change from the existing eight or less MYO to seven or less MYO in the applicable nonattainment area. If triggered, these additional vehicles would then be subject to Smog Check inspections based on the area in which the vehicle is registered (i.e., enhanced, basic, and change of ownership), resulting in additional emissions control equipment failures being identified and corrected, thereby reducing emissions that typically result when emissions control equipment is not performing as designed. The emissions reduction estimates from the Measure are detailed for each nonattainment area in Section 5 of this report. The methodology for calculating these estimates can be found in Appendix B. The Measure can be triggered a second time for a nonattainment area; if triggered a second time, the Smog Check exemption would then only apply to vehicles six or less MYO.

Implementation of the Measure will require coordination with other California State agencies. Their relevant roles and responsibilities are outlined below.

- **Bureau of Automotive Repair:** BAR, as part of the Department of Consumer Affairs, provides oversight of the automotive repair industry and administers vehicle emissions reduction and safety programs. Specifically, as it pertains to the Measure, BAR administers and enforces the Smog Check Program.
- **California Department of Motor Vehicles:** DMV administers vehicle registration and licensing and supports BAR in administering the Smog Check Program.

CARB staff will work closely with BAR and DMV staff throughout the process and leading up to a possible Triggering Event, so that both agencies have as much notice as possible for the work that will be required for full implementation of the Measure. For most potential failures to attain a relevant standard, preliminary data for the relevant ozone or PM_{2.5} season is available earlier and U.S. EPA makes their failure to attain findings six months after the attainment date, so CARB staff will be able to notify and work with BAR and DMV preemptively to ensure the Measure implementation is as smooth as possible.

CARB staff has quantified the emission reductions that would be achieved from implementation of the Measure, if triggered, and have documented the results in Section 5 of this report. The emission reductions anticipated are surplus to the current Smog Check Program in the nonattainment areas and they are not otherwise required by or assumed in a SIP-related program, or any other adopted State air quality program. The changes to Smog Check exemptions are enforceable since DMV requires a vehicle owner to obtain a Smog Check inspection certificate indicating a vehicle has passed its Smog Check inspection to renew their vehicle registration. The reductions from the Measure are permanent in that, if triggered, the vehicle will need to be repaired in order to renew their registration.

A. Implementation

Within 30 days of the effective date of U.S. EPA determining an applicable Triggering Event occurred, CARB will transmit a letter to BAR and DMV conveying its finding under H&SC § 44011(a)(4)(B)(ii) that providing the exception for certain motor vehicles from Smog Check inspection in specific nonattainment areas (defined by specified ZIP Codes) will prohibit the State from meeting commitments with respect to the SIP as required by the Act. This letter will explain that the Measure is being triggered to meet contingency measure requirements under Act section 172(c)(9) and/or 182(c)(9), and effectuating the change to the Smog Check exemptions for motor vehicles from eight or less MYO to seven or less MYO throughout the applicable nonattainment area (or six or less MYO in cases of the second trigger).

Prior to CARB staff submitting a letter to BAR and DMV, CARB staff will coordinate with BAR and DMV if there is potential for contingency to be triggered in the nonattainment areas in Table 1. CARB staff will meet regularly with BAR and DMV staff throughout the process to implement this Measure. Upon receipt of the CARB letter and the applicable ZIP Codes, CARB, BAR and DMV staff will begin implementation of the change in exemption length to Smog Check and take the following actions:

- DMV will update their Smog Check renewal programming to require a Smog Check inspection for the eight MYO vehicles (or seven MYO in the case of a second trigger) in the ZIP Codes provided by CARB staff;
- The eight to seven MYO (or seven to six MYO) exemption change will begin for registrations expiring beginning January 1st of the applicable year considering the time it takes for DMV to program this change and their registration renewal process;
- 60 days before the expiration date of the vehicle registration, DMV will send out registration renewals that include these newly impacted vehicles along with those already subject to Smog Check inspection;
- The notice will include information on the change in exemptions, reason for change, and resources for obtaining a Smog Check inspection from a certified station;

- CARB staff will work with DMV to develop and include an informational paper that will accompany the registration renewal with the information as included in the notice; and
- BAR and DMV will administer and enforce the new changes to the Smog Check Program.

B. Title VI and Environmental Justice

Title VI of the Civil Rights Act of 1964 (Title VI) provides that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. Other relevant federal laws prohibit discrimination in the use of federal funds based on disability, sex, and age.¹³ As a recipient of federal funds, CARB must ensure it complies with Title VI and U.S. EPA's Title VI implementation regulations¹⁴ in its relevant programs and policies.

CARB's public process to engage with stakeholders in development of the Measures, its equity analysis of the Measure, and information about CARB's Civil Rights Policy and Compliant process is summarized below.

Public Process

In developing the proposed Measure, CARB staff engaged in a thorough public process that addresses the requirements of Title VI. CARB staff initiated the public process with release of a concept document and hosting a remote online workshop in August 2023 to solicit input from the public.¹⁵ The workshop was hosted through Zoom in the late afternoon to allow more community members to participate without needing to travel. The public notice for the workshop provided a contact for special accommodation requests by interested stakeholders, and CARB staff also made available on the notice and its website a staff email address to accept public questions and comments. The concept document and other materials were available in English and Spanish on the website and through emails sent to relevant email list serves, including the Environmental Justice Stakeholders Group. The workshop included translation services that provided a forum in both English and Spanish for the proposed Measure to be discussed in a public setting and provide additional opportunity for public feedback, input, and ideas. After the workshop, CARB staff

¹³ Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794; Title IX of the Education Amendments of 1972, as amended, 20 U.S.C. §§ 1681 et seq.; Age Discrimination Act of 1975, 42 U.S.C. §§ 6101 et seq.; and Federal Water Pollution Control Act Amendments of 1972, Pub. L. 92-500 § 13, 86 Stat. 903 (codified as amended at 33 U.S.C. § 1251 (1972)).

¹⁴ 40 C.F.R. Part 7.

¹⁵

has made the recording of the workshop available on its website. CARB staff considered the public feedback it received in developing the Measure. CARB staff will continue to address the requirements of Title VI in the event implementation of the Measure is triggered and provide continuing opportunities for public feedback.

Racial Equity, Environmental Justice, and Equity Analysis

Central to CARB's mission is the commitment to racial equity and environmental justice and ensuring a clean and healthy environment for all Californians. Many low-income and overburdened communities within the nonattainment areas, and across the State, continue to experience disproportionately high levels of air pollution and the resulting detrimental impacts to their health. To address longstanding environmental and health inequities from elevated levels of criteria pollutants (and toxic air contaminants), CARB prioritizes environmental justice, incorporating racial equity, and conducting meaningful community engagement in its policy and planning efforts and programs. It is imperative to optimize California's control programs to maximize emissions reductions and provide targeted near-term benefits in those communities that continue to bear the brunt of poor air quality.

Across the agency, CARB is engaged in specific localized efforts include development of community air monitoring networks to learn about local exposures, development of a racial equity assessment lens to consider benefits and burdens of CARB programmatic work in the planning stages, continuously increasing and improving community engagement efforts, and implementation of Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017), known as the Community Air Protection Program¹⁰. Significant progress has been made to address air pollution statewide and in local communities, and it is imperative to also ensure all Californians have access to healthy air quality.

Specific to this Measure, given the existing disproportionate impacts overburdened communities already face, CARB staff sought to evaluate whether the proposed Measure would itself impact disproportionately burden certain communities. In conducting this evaluation, CARB staff analyzed whether there would be disproportionate impact on disadvantaged communities within the affected nonattainment areas if the Measure is triggered.

CARB staff also analyzed the impacts of the Measure on vehicle owners in disadvantaged communities (DACs). CARB staff evaluated the potential impacts on owners of 8 MYO vehicles that reside in disadvantaged communities (DACs), which are defined by California Senate Bill 535¹⁶ as census tracts receiving the highest 25 percent of overall scores in *CalEnviroScreen 4.0*¹⁷. These communities face the highest air pollution and other

¹⁶ De Leon, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB535

¹⁷ <https://oehha.ca.gov/calenviroscreen>

environmental burdens, and CARB staff is working to ensure that policy changes do not have a negative disproportionate impact on these populations.

In order to evaluate whether vehicle owners in DACs will be disproportionately impacted by this Measure if it is triggered, CARB staff compared the proportion of 8 MYO vehicles subject to the Smog Check inspection that are registered in DACs in each nonattainment area to the proportion of vehicles that are subject to the Smog Check inspection at some point in their lifetime that are registered in DACs for each nonattainment area. CARB staff used DMV data reflecting vehicle registrations as of 2021; thus, model year 2013 was used to represent 8 MYO vehicles and calculate the proportion of vehicles subject to the change. CARB staff assumes that the proportion of 8 MYO vehicles subject to the Smog Check inspection will be approximately equivalent in future attainment years. Based on this analysis for all areas in Table 1, CARB staff found that the proportion of vehicle owners potentially impacted by the Measure, if triggered, is not disproportionate to the population as a whole in each of the nonattainment areas analyzed. The proportion of people impacted with vehicles registered in DACs is about equal to the proportion of vehicle owners residing in DACs area-wide and generally represent a relatively small portion of the total population being impacted.

$$\frac{\text{8MYO vehicles registered in DACs in nonattainment area}}{\text{8MYO vehicles registered in nonattainment area}} = \frac{\text{all vehicles registered in DACs in nonattainment area}}{\text{all vehicles registered in nonattainment area}}$$

If the Measure is triggered, though, there could be other potential impacts to vehicle owners that should be considered. The main impacts to vehicle owners are the additional monetary cost and time of obtaining a Smog Check inspection and potential repairs one year earlier than previously required. The inspection and certification costs are mostly offset by the Smog Abatement Fee that exempted vehicle owners must pay. A Smog Check inspection averages \$55 and is required every other year in most areas of the State. The Smog Abatement Fee is \$25 and paid annually as a part of renewal of vehicle registration, thus two years of the Smog Abatement Fee is roughly equivalent to the average cost of a Smog Check Inspection.

Repair costs can range, but generally cost \$750 on average, which could be a significant cost burden. However, financial assistance is available through BAR's Consumer Assistance Program, which provides up to \$1,200 for repair costs. In terms of time to obtain a Smog Check inspection which can vary significantly due to location, many vehicles require regular service throughout the year, and owners may be able to schedule a Smog Check inspection concurrently. Additionally, the potential foregone dollars to the Moyer Program may reduce additional opportunities for emission reductions in districts where the local air district dedicates Moyer Program funds exclusively to disadvantaged communities. CARB staff will

continue to explore additional activities or funding opportunities to mitigate these potential disproportionate impacts.

Civil Rights Policy and Discrimination Complaint Process

Under CARB's written Civil Rights Policy and Discrimination Complaint process (Civil Rights Policy), CARB has a policy of nondiscrimination in its programs and activities and implements a process for discrimination complaints filed with CARB, which is available on CARB's website. The Civil Rights Officer coordinates implementation of CARB's nondiscrimination activities, including as the Equal Employment Opportunity (EEO) Officer for employment purposes, and who can be reached at *EEOP@arb.ca.gov*, or (279) 208-7110.¹⁸

The Civil Rights Policy and Discrimination Complaint Process provides the following information about the nondiscrimination policy and its applicability:

It is the California Air Resources Board (CARB) policy to provide fair and equal access to the benefits of a program or activity administered by CARB. CARB will not tolerate discrimination against any person(s) seeking to participate in, or receive the benefits of, any program or activity offered or conducted by CARB. Members of the public who believe they were unlawfully denied full and equal access to an CARB program or activity may file a civil rights complaint with CARB under this policy. This non-discrimination policy also applies to people or entities, including contractors, subcontractors, or grantees that CARB utilizes to provide benefits and services to members of the public. [. . .]

As described in the Civil Rights Policy and Discrimination Complaint Process, the Civil Rights Officer coordinates implementation of nondiscrimination activities:

CARB's Executive Officer will have final authority and responsibility for compliance with this policy. CARB's Civil Rights Officer, on behalf of the Executive Officer, will coordinate this policy's implementation within CARB, including work with the Ombudsman's Office, Office of Communications, and the staff and managers within a program or activity offered by CARB. The Civil Rights Officer coordinates compliance efforts, receives inquiries concerning non-discrimination requirements, and ensures CARB is complying with state and federal reporting and record retention requirements, including those required by Code of Federal Regulations, title 40, section 7.10 et seq.

¹⁸ CARB. California Air Resources Board and Civil Rights. <https://ww2.arb.ca.gov/california-air-resources-board-and-civil-rights>; Civil Rights Policy and Discrimination Complaint Process. November 1, 2016. <https://ww2.arb.ca.gov/sites/default/files/2023-01/2016-11-03%20CARB%20Civil%20Rights%20Policy%20Revised%20Final.pdf>

The Civil Rights Policy and Discrimination Complaint Process also describes in detail the complaint procedure, as follows:

A Civil rights complaint may be filed against CARB or other people or entities affiliated with CARB, including contractors, subcontractors, or grantees that CARB utilizes to provide benefits and services to members of the public. The complainant must file his or her complaint within one year of the alleged discrimination. This one-year time limit may be extended up to, but no more than, an additional 90 days if the complainant first obtained knowledge of the facts of the alleged violation after the expiration of the one-year time limit. [. . .]

The Civil Rights Officer will review the facts presented and collected and reach a determination on the merits of the complaint based on a preponderance of the evidence. The Civil Rights Officer will inform the complainant in writing when CARB has reached a determination on the merits of the discrimination complaint. Where the complainant has articulated facts that do not appear discriminatory but warrants further review, the Civil Rights Officer, in his or her discretion, may forward the complaint to a party within CARB for action. The Civil Rights Officer will inform the complainant, either verbally or in writing, before facilitating the transfer. [. . .]

CARB will not tolerate retaliation against a complainant or a participant in the complaint process. Anyone who believes that they have been subject to retaliation in violation of this policy may file a complaint of retaliation with CARB following the procedures outlined in this policy.

There is a Civil Rights Complaint Form available¹⁹ on the webpage, which should be used by members of the public to file a complaint of discrimination against CARB that an individual believes occurred during the administration of its programs and services offered to the public. As described on CARB's webpage, for all complaints submitted, the Civil Rights Officer will review the complaint to determine if there is a prima facie complaint (which means, if all facts alleged were true, would a violation of the applicable policy exist). If the Civil Rights Officer identifies a prima facie complaint in the jurisdiction of the Civil Rights Office, the Civil Rights Office will investigate and determine whether there is a violation of the policy.

The laws and regulations that CARB implements through this policy include:

- Code of Federal Regulations, Title 40 Parts 5 and 7;
- Title VI of the U.S. Civil Rights Act of 1964, as amended;

¹⁹ CARB. Civil Rights Complaint Form. July 2019. https://ww2.arb.ca.gov/sites/default/files/2023-01/eo_eeo_033_civil_rights_complaints_form.pdf

- Section 504 of the Rehabilitation Act of 1973;
- Age Discrimination Act of 1975;
- Title IX of the Education Amendments of 1972;
- California Government Code, title 2, Division 3, Part 1, Chapter 2, Article 9.5, *Discrimination*, section 11135 et seq.; and
- California Code of Regulations, title 2, section 10000 et seq.

As part of its overarching civil rights and environmental justice efforts, CARB is in the process of updating its Civil Rights Policy and will make those publicly available once complete. These updates will reflect available U.S. EPA and U.S. Department of Justice resources for Title VI and environmental justice policies. CARB encourages U.S. EPA to issue additional guidance to further clarify Title VI requirements and expectations to assist state implementation efforts.

C. Fiscal Impacts to State Programs

The Measure has some fiscal impacts. Previously exempted vehicles will no longer pay the annual Smog Abatement Fee of \$25, but instead pay the biennial Smog Check inspection certification fee of \$8.25, which is directed to BAR to fund the Smog Check Program. Of the Smog Abatement fee, \$21 is directed to the Air Pollution Control Fund to fund the Moyer Program, which will no longer be collected if the exemption changes. If the Measure is triggered, this will result in fewer funds being directed towards the Air Pollution Control Fund for the Moyer Program, but an increase in certification fees for BAR. For each nonattainment area and standard, CARB staff used the estimated number of vehicles impacted by the change in exemption model year to estimate the fiscal impact of a potential change in exemption if the Measure is triggered. The estimated loss of funding if triggered is detailed for each nonattainment area in Section 5.

The potential loss of funds resulting from the Measure being triggered in an area may result in a loss of funds for the Moyer Program, which could result in fewer Moyer Program projects and fewer opportunities for additional emission reductions. If the Measure is triggered in a nonattainment area, the monetary impacts will be statewide. The Moyer Program funds are collected statewide but allocated to each local air district according to requirements set by H&SC §44299.2. For South Coast Air Basin only, the allocation is based on human population relative to the State as a whole. For the remaining local air districts, funds are allocated based on each local air district's population, air quality, and historical allocation awarded in Fiscal Year (FY) 2002-2003. CARB staff used the statewide average cost effectiveness of Moyer Program projects to estimate the Moyer Program emission reductions impact if the Measure is triggered. Based on CARB staff analysis, the resulting potential foregone emissions reductions from fewer potential projects funded through the Moyer Program will not outweigh the emissions reductions benefit from the Measure. The

estimated loss in potential emissions reductions from the Moyer Program is detailed below in each nonattainment area section of this report. The methodology for calculating the impact of the loss of Moyer Program funds can be found in Appendix C.

D. CEQA

CARB staff has determined that the Measure is exempt from CEQA under the “general rule” or “common sense” exemption (14 CCR 15061(b)(3)). The common sense exemption states a project is exempt from CEQA if “the activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.” The Measure addresses contingency measure requirements under the Act and would remove an exemption from a Smog Check inspection for certain model year vehicles only in the event a Triggering Event occurs. The Measure would only go into effect in the area in which it is triggered. The change in exemptions for vehicles required to obtain a Smog Check inspection, only if triggered by an applicable event, would not require new equipment and has no potential to adversely affect air quality or any other environmental resource area. Based on CARB staff’s review it can be seen with certainty that there is no possibility that the Measure may result in a significant adverse impact on the environment; therefore, this activity is exempt from CEQA.

CARB staff has also determined that the Measure is categorically exempt from CEQA under the “Class 8” exemption (Cal. Code Regs., tit. 14, § 15308). Class 8 exemptions apply to “actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.” The proposed Measure is an action by CARB, a regulatory agency, to protect the environment in the event a Triggering Event occurs. The Measure will assure the maintenance and enhancement of the environment by removing exemptions from the Smog Check Program, resulting in additional emissions control equipment failures being identified and corrected, thereby reducing emissions that typically result when emissions control equipment is not performing as designed. CARB staff analysis indicates air emission benefits exceed the disbenefits in each relevant air basin. Therefore, the Smog Check Contingency Measure is also exempt as a Class 8 exemption.

Section 5. Nonattainment Area Analyses

California's nonattainment challenge for ozone and PM2.5 NAAQS in most of the State is driven in part due to motor vehicle emissions. While CARB's regulations require motor vehicles to meet emission standards throughout their useful lives, this is not guaranteed. CARB staff recommends the Board exercise the authority under this statute and find that exempting motor vehicles that are less than 8 years old from the requirements is preventing the State from meeting its commitments under the Act related to complying with the Act's contingency measure requirements. Subjecting vehicles to the Smog Check Program to reduce emissions as a contingency measure when a Triggering Event occurs would help the State meet its contingency measure requirement under the Act. In addition to CARB's actions, each local air district has either included a complementary contingency measure or measures in their SIP or will provide a reasoned justification for why they are unable to provide contingency measures for the full amount of reductions as specified in the draft guidance. Below, for each nonattainment area listed in Table 1, CARB staff is providing the estimate of the one year's worth of progress, estimate of contingency measure reductions, equity impacts, and Moyer Program impacts.

A. Coachella Valley

The Measure complements local air district efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards. The required amount of emission reductions from contingency measures, or one year's worth (OYW) of progress based on the draft guidance, is shown in Table 3.

Table 3. Coachella Valley OYW of Progress
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2031	0.34	0.14
70 ppb 8-hour Ozone	2037	0.17	0.10

Table 4 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 4. Coachella Valley Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2031	0.008	0.003
70 ppb 8-hour Ozone	2037	0.008	0.003

Equity Impacts

Table 5 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in the Coachella Valley. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 4 percent. There is not expected to be a disproportionate impact on disadvantaged communities should the measure be triggered.

Table 5. Coachella Valley Vehicle Populations

All Vehicles	All Vehicles Population	8MYO Vehicles* (MY 2013)	8MYO Vehicles* (MY 2013) Population
Total Vehicle Population	320,375	Vehicle Population	14,622
Vehicle Population in DACs	15,492	Vehicle Population in DACs	640
Proportion DAC	4.84%	Proportion DAC	4.38%

*MY 2013 Vehicle populations were used to represent 8MYO vehicles.

Carl Moyer Impacts

Should the Measure be triggered in Coachella Valley, the potential funds lost by year is listed below in Table 6. The loss in funding would have statewide impacts as the funds are collected and redistributed to districts based on the formula H&SC § 44299.2. Based on statewide cost effectiveness and historical allocations to each local air district, the estimated loss in potential emission reduction benefits in Coachella Valley if the Measure is triggered is shown in Table 7.

Table 6. Coachella Valley 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
75 ppb 8-hour Ozone	2031	\$ 311,468
70 ppb 8-hour Ozone	2037	\$ 325,868

Table 7. Coachella Valley Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
75 ppb 8-hour Ozone	2031	0.0002
70 ppb 8-hour Ozone	2037	0.0002

B. Eastern Kern County

The Measure complements local air district efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 8.

Table 8. Eastern Kern County OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2026	0.30	0.08
70 ppb 8-hour Ozone	2032	0.26	0.07

Table 9 documents the emission reductions that would occur after the attainment year due to implementation of the Measure if triggered.

Table 9. Eastern Kern County Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2026	0.003	0.001
70 ppb 8-hour Ozone	2032	0.003	0.001

Equity Impacts

Table 10 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in Eastern Kern County. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 4 percent. There is not expected to be a disproportionate impact on disadvantaged communities, should the measure be triggered.

Table 10. Eastern Kern County Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles	All Vehicles Population	8MYO Vehicles* (MY 2013)	8MYO Vehicles* (MY 2013) Population
Total Vehicle Population	86,909	Vehicle Population	4,209
Vehicle Population in DACs	3,640	Vehicle Population in DACs	174
Proportion DAC	4.19%	Proportion DAC	4.12%

*MY 2013 Vehicle populations were used to represent 8MYO vehicles.

Carl Moyer Impacts

Should the Measure be triggered in Eastern Kern County, the potential funds lost statewide by year is listed below in Table 11. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in Eastern Kern County if the Measure is triggered is shown in Table 12.

Table 11. Eastern Kern County 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
75 ppb 8-hour Ozone	2026	\$ 112,514
70 ppb 8-hour Ozone	2032	\$ 116,670

Table 12. Eastern Kern Carl Moyer Program Potential Foregone Emissions Reductions
(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
75 ppb 8-hour Ozone	2026	0.000003
70 ppb 8-hour Ozone	2032	0.000003

C. Mariposa County

The Measure complements local air district efforts to meet contingency measure requirements for the 70 ppb 8-hour ozone standard. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 13.

Table 13. Mariposa County OYW of Progress
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
70 ppb 8-hour Ozone	2026	0.02	0.13

Table 14 documents the emission reductions that would occur after the attainment year due to implementation of the Measure if triggered.

Table 14. Mariposa County Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
70 ppb 8-hour Ozone	2026	0.0003	0.0001

Equity Impacts

Per scores in [CalEnviroScreen 4.0](#), there are very few vehicles registered in DACs in Mariposa County. There is not expected to be a disproportionate impact on disadvantaged communities should the measure be triggered.

Carl Moyer Impacts

Should the Measure be triggered in Mariposa County, the potential funds lost by year is listed below in Table 15. Based on district allocations of Moyer Program funds per H&SC §44299.2, Mariposa County receives \$200,000 regardless of the funding available statewide. Thus, there will be no emissions disbenefit from a decrease in Moyer Funds in Mariposa County if the measure is triggered, shown in Table 16.

Table 15. Mariposa County 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
70 ppb 8-hour Ozone	2026	\$ 8,691

Table 16. Mariposa County Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
70 ppb 8-hour Ozone	2026	0.000

D. Sacramento Metro Area

The Measure complements the local air districts' efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 17.

Table 17. Sacramento Metro OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2024	2.20	1.78
70 ppb 8-hour Ozone	2032	1.26	0.99

Table 18 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 18. Sacramento Metro Area Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2024	0.077	0.037
70 ppb 8-hour Ozone	2032	0.047	0.015

Equity Impacts

Table 19 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in the Sacramento Metro area. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 7 percent. There is not expected to be a disproportionate impact on disadvantaged communities should the measure be triggered.

Table 19 Sacramento Metro Area Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles	8 MYO Vehicles (MY 2013)		
Total Vehicle Population	1,766,464	MY13 Vehicle Population	88,163
Vehicle Population in DACs	135,377	MY13 Vehicle Population in DACs	6,387
Proportion DAC	7.66%	Proportion DAC	7.24%

Carl Moyer Impacts

Should the Measure be triggered in the Sacramento Metro Area, the potential funds lost by year is listed below in Table 20. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in Sacramento Metro Area if the Measure is triggered is shown in Table 21.

Table 20. Sacramento Metro Area 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
75 ppb 8-hour Ozone	2024	\$ 2,554,206
70 ppb 8-hour Ozone	2032	\$ 2,020,844

Table 21. Sacramento Metro Area Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NO _x (tpd)
75 ppb 8-hour Ozone	2024	0.0009
70 ppb 8-hour Ozone	2032	0.0007

E. San Diego County

The Measure complements local air district efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 22.

Table 22. San Diego County OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NO _x (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2026	2.19	1.97
70 ppb 8-hour Ozone	2032	1.26	0.89

Table 23 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 23. San Diego County Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2026	0.065	0.027
70 ppb 8-hour Ozone	2032	0.056	0.016

Equity Impacts

Table 24 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in San Diego County. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 5.5 percent. There is not expected to be a disproportionate impact on disadvantaged communities, should the measure be triggered.

Table 24. San Diego County Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles		8 MYO Vehicles (MY 2013)	
Total Vehicle Population	2,360,242	MY13 Vehicle Population	117,373
Vehicle Population in DACs	146,252	MY13 Vehicle Population in DACs	6,433
Proportion DAC	6.20%	Proportion DAC	5.48%

Carl Moyer Impacts

Should the Measure be triggered in San Diego County, the potential funds lost by year is listed below in Table 25. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in San Diego County if the Measure is triggered is shown in Table 26.

Table 25. San Diego County 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
75 ppb 8-hour Ozone	2026	\$ 2,308,061
70 ppb 8-hour Ozone	2032	\$ 2,341,248

Table 26. San Diego County Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NO _x (tpd)
75 ppb 8-hour Ozone	2026	0.001
70 ppb 8-hour Ozone	2032	0.001

F. San Joaquin Valley

The Measure complements district efforts to meet contingency measure requirements for the 80 ppb, 75 ppb and 70 ppb 8-hour ozone standards, the 15 ug/m³ and 12 ug/m³ annual PM_{2.5} standards, and the 35 ug/m³ 24-hour PM_{2.5} standard. On May 18, 2023, specific to PM_{2.5} standards, the San Joaquin Valley Air Pollution Control District adopted their *PM_{2.5} Contingency Measure SIP Revision* which was submitted to U.S. EPA by CARB staff. Further, on June 23, 2023, CARB staff committed to submit to U.S. EPA a triggered contingency measure under State authority for the PM_{2.5} standards. If adopted, the Measure will be submitted to U.S. EPA to fulfill that commitment.

The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 27 for the 80 ppb, 75 ppb and 70 ppb 8-hour ozone standards.

Table 27. San Joaquin Valley OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NO _x (tpd)	ROG (tpd)
80 ppb 8-hour ozone	2023	7.57	2.40
75 ppb 8-hour Ozone	2031	4.25	1.88
70 ppb 8-hour Ozone	2037	2.35	1.73

Table 28 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 28. San Joaquin Valley Potential Reductions from Measure
(reductions calculated on summer planning inventory for ozone, annual planning inventory for PM2.5)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
80 ppb 8-hour Ozone	2023	0.112	0.056
15 µg/m ³ Annual PM2.5	2023	0.117	0.052
35 µg/m ³ 24-hour PM2.5	2024	0.120	0.052
12 µg/m ³ Annual PM2.5	2030	0.086	0.027
75 ppb 8-hour Ozone	2031	0.079	0.025
70 ppb 8-hour Ozone	2037	0.076	0.024

Equity Impacts

Table 29 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in the San Joaquin Valley. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 28-29 percent, though the percentage of people residing in DACs in San Joaquin Valley is relatively higher compared to other districts. There is not expected to be a disproportionate impact on disadvantaged communities should the measure be triggered.

Table 29. San Joaquin Valley Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles		8 MYO Vehicles (MY 2013)	
Total Vehicle Population	2,493,831	MY13 Vehicle Population	113,744
Vehicle Population in DACs	738,064	MY13 Vehicle Population in DACs	31,906
Proportion DAC	29.60%	Proportion DAC	28.05%

Carl Moyer Impacts

Should the Measure be triggered in San Joaquin Valley, the potential funds lost by year is listed below in Table 30. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in the San Joaquin Valley if the Measure is triggered is shown in Table 31.

Table 30. San Joaquin Valley 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars ²⁰
80 ppb 8-hour Ozone	2023	\$ 3,781,802
15 µg/m ³ Annual PM2.5	2023	\$ 3,781,802
35 µg/m ³ Annual PM2.5	2024	\$ 3,880,753
12 µg/m ³ Annual PM2.5	2030	\$ 3,171,435
75 ppb 8-hour Ozone	2031	\$ 3,167,124
70 ppb 8-hour Ozone	2037	\$ 3,300,289

Table 31 San Joaquin Valley Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
80 ppb 8-hour Ozone	2023	0.004
15 µg/m ³ Annual PM2.5	2023	0.004
35 µg/m ³ Annual PM2.5	2024	0.004
12 µg/m ³ Annual PM2.5	2030	0.003
75 ppb 8-hour Ozone	2031	0.003
70 ppb 8-hour Ozone	2037	0.003

²⁰ For years with multiple standards/ triggers in the same year, the loss in smog abatement fees would only be triggered once.

G. South Coast Air Basin

The Measure complements local air district efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards, and the 12 ug/m³ annual PM2.5 standard. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 32 for the 75 ppb and 70 ppb 8-hour ozone standards.

Table 32. South Coast Air Basin OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2031	4.12	6.38
70 ppb 8-hour Ozone	2037	2.62	3.54

Table 33 documents the emission reductions that occur after the attainment or final RFP milestone year due to implementation of the Measure if triggered.

Table 33. South Coast Air Basin Potential Reductions from Measure

(reductions calculated on summer planning inventory for ozone, annual planning inventory for PM2.5)

Standard	Attainment/RFP Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2029	0.295	0.096
70 ppb 8-hour Ozone	2035	0.254	0.077
12 µg/m ³ Annual PM2.5	2030	0.300	0.093

Equity Impacts

Table 34 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in the South Coast Air Basin. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is lower than the proportion of the general population of all vehicles registered in DACs overall, though the percentage of people residing in DACs in the South Coast Air Basin is relatively higher compared to other local air districts. There is not expected to be a disproportionate impact on disadvantaged communities should the measure be triggered.

Table 34. South Coast Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles		8 MYO Vehicles (MY 2013)	
Total Vehicle Population	11,296,609	MY13 Vehicle Population	504,562
Vehicle Population in DACs	3,324,206	MY13 Vehicle Population in DACs	129,225
Proportion DAC	29.43%	Proportion DAC	25.61%

Carl Moyer Impacts

Should the measure be triggered in the South Coast Air Basin, the potential funds lost by year is listed below in Table 35. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in the South Coast Air Basin if the Measure is triggered is shown in Table 36.

Table 35. South Coast 8 MYO Smog Abatement Fees

Standard	Attainment/RFP Year	Potential Dollars
75 ppb 8-hour Ozone	2029	\$ 11,273,782
70 ppb 8-hour Ozone	2035	\$ 11,195,217
12 µg/m ³ Annual PM2.5	2030	\$ 11,122,871

Table 36. South Coast Carl Moyer Program Potential Foregone Emissions Reductions
(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment/RFP Year	NO _x (tpd)
75 ppb 8-hour Ozone	2029	0.024
70 ppb 8-hour Ozone	2035	0.024
12 µg/m ³ Annual PM2.5	2030	0.024

H. Ventura County

The Measure complements local air district efforts to meet contingency measure requirements for the 70 ppb 8-hour ozone standard. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 37.

Table 37. Ventura County OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
70 ppb 8-hour Ozone	2026	0.48	0.20

Table 38 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 38. Ventura County Potential Reductions from Measure

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
70 ppb 8-hour Ozone	2026	0.013	0.005

Equity Impacts

Table 39 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in Ventura County. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 3 percent. There is not expected to be a disproportionate impact on disadvantaged communities, should the measure be triggered.

Table 39. Ventura County Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles		8 MYO Vehicles (MY 2013)	
Total Vehicle Population	661,147	MY13 Vehicle Population	29,970
Vehicle Population in DACs	22,466	MY13 Vehicle Population in DACs	899
Proportion DAC	3.40%	Proportion DAC	3.00%

Carl Moyer Impacts

Should the Measure be triggered in Ventura County, the potential funds lost by year is listed below in Table 40. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in Ventura County if the Measure is triggered is shown in Table 41.

Table 40. Ventura County 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
70 ppb 8-hour Ozone	2026	\$ 459,328

Table 41. Ventura County Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
70 ppb 8-hour Ozone	2026	0.00008

I. West Mojave Desert

The Measure complements local air districts efforts to meet contingency measure requirements for the 75 ppb and 70 ppb 8-hour ozone standards. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 42.

Table 42. West Mojave Desert OYW of Progress
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
75 ppb 8-hour Ozone	2026	1.50	0.39
70 ppb 8-hour Ozone	2032	1.18	0.35

Table 43 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 43. West Mojave Desert Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
75 ppb 8-hour Ozone	2026	0.021	0.009
70 ppb 8-hour Ozone	2032	0.018	0.006

Equity Impacts

Table 44 documents the potential impact of the Measure on DACs as identified in [CalEnviroScreen 4.0](#) in the West Mojave Desert. The proportion of vehicles that are registered in DACs and would be impacted if the Measure is triggered is proportional to the general population of all vehicles registered in DACs overall, about 8.5 percent. There is not expected to be a disproportionate impact on disadvantaged communities, should the measure be triggered.

Table 44. West Mojave Desert Vehicle Populations
(vehicle populations calculated from EMFAC2021 Fleet Database)

All Vehicles		8 MYO Vehicles (MY 2013)	
Total Vehicle Population	665,512	MY13 Vehicle Population	23,721
Vehicle Population in DACs	56,624	MY13 Vehicle Population in DACs	2,047
Proportion DAC	8.5%	Proportion DAC	8.6%

Carl Moyer Impacts

Should the measure be triggered in West Mojave Desert, the potential funds lost by year is listed below in Table 45. Based on statewide cost effectiveness and historical allocations to each local air district, the loss in potential emission reduction benefits in West Mojave Desert if the Measure is triggered is shown in Table 46.

Table 45. West Mojave Desert 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
75 ppb 8-hour Ozone	2026	\$ 746,890
70 ppb 8-hour Ozone	2032	\$ 752,076

Table 46. West Mojave Desert Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx (tpd)
75 ppb 8-hour Ozone	2026	0.00006
70 ppb 8-hour Ozone	2032	0.00006

J. Western Nevada County

The Measure complements local air district efforts to meet contingency measure requirements for the 70 ppb 8-hour ozone standard. The required amount of emission reductions from contingency measures, or OYW of progress based on the draft guidance, is shown in Table 47.

Table 47. Western Nevada County OYW of Progress

(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx (tpd)	ROG (tpd)
70 ppb 8-hour Ozone	2026	0.09	0.08

Table 48 documents the emission reductions that occur after the attainment year due to implementation of the Measure if triggered.

Table 48. Western Nevada County Potential Reductions from Measure
(reductions calculated on summer planning inventory)

Standard	Attainment Year	NOx Benefits (tpd)	ROG Benefits (tpd)
70 ppb 8-hour Ozone	2026	0.002	0.001

Equity Impacts

Per scores in *CalEnviroScreen 4.0*, there is only one vehicle registered in a DAC within the Western Nevada County nonattainment area. There is not expected to be a disproportionate impact on disadvantaged communities, should the measure be triggered.

Carl Moyer Impacts

Should the Measure be triggered in Western Nevada County, the potential funds lost by year is listed below in Table 49. Based on district allocations of Moyer Program funds per H&SC §44299.2, Northern Sierra Air Quality Management District, the local air district for Western Nevada County, receives \$200,000 regardless of the funding available statewide. Thus, there will be no emissions disbenefit from a decrease in Moyer Funds in Western Nevada County if the measure is triggered, shown in Table 50.

Table 49. Western Nevada County 8 MYO Smog Abatement Fees

Standard	Attainment Year	Potential Dollars
70 ppb 8-hour Ozone	2026	\$ 79,262

Table 50. Western Nevada County Carl Moyer Program Potential Foregone Emissions Reductions

(reductions calculated on annual planning inventory consistent with Moyer Program cost-effectiveness)

Standard	Attainment Year	NOx Benefits (tpd)
70 ppb 8-hour Ozone	2026	0.000

Section 6. Staff Recommendation

CARB staff recommends the Board:

1. Adopt the Measure addressing contingency measure requirements for the applicable nonattainment areas and standards as listed in Table 1;
2. Approve submittal into the California SIP of H&SC sections 44011(a)(4)(A) and (B); and
3. Direct the Executive Officer to submit the Measure, and H&SC sections 44011(a)(4)(A) and (B), to U.S. EPA as a revision to the California SIP.

Appendix A: Infeasibility Analysis

Infeasibility Analysis

Measure Analysis

CARB staff analyzed CARB's suite of control measures for all sources under CARB authority to identify potential contingency measure options. CARB control measures reduce NO_x, ROG and PM_{2.5} emissions. CARB currently has programs in place or under development for most of these sources and have evaluated a variety of regulatory mechanisms within existing and new programs for potential contingency triggers.

Criteria for Contingency Feasibility

CARB staff has evaluated potential options for a contingency measure within each of CARB's regulations (Table 51) using three criteria to determine its feasibility given the contingency measure requirements under the Act, recent court decisions and draft guidance. First, each measure was evaluated on whether it could be implemented within 30 days of being triggered and achieve the necessary reductions within 1-2 years of being triggered. Second, the technological feasibility of each option was considered to assess whether the measure would be technically feasible to implement. Measure requirements may be unavailable or cost prohibitive to implement, especially in the time frame required for contingency. Lastly, CARB staff evaluated whether the timeline for adoption would be compatible with the current consent decree deadline of September 30, 2024²¹. The contingency measure must be adopted by CARB and submitted to and fully approved by U.S. EPA by this date to resolve a San Joaquin Valley PM_{2.5} Federal Implementation Plan (FIP) published by U.S. EPA on August 7, 2023. A CARB statewide measure needing a full regulatory process typically requires five years for development and adoption by CARB and additional time for U.S. EPA's approval process including obtaining an Act waiver or authorization.

Challenges for CARB Measures

Based on CARB's feasibility analysis, there are a few common components of CARB regulations that limit the options for contingency measures. All new engine and emissions standards set by CARB require waivers or authorizations from federal preemption under the Clean Air Act; this process can take anywhere from months to several years, and then U.S. EPA must also act to approve the regulation into the California SIP. Further, CARB regulations that require fleet turnover or new engine standards require a long lead time for implementation. Engine manufacturers would need lead time to design, plan, certify, manufacture, and deploy cleaner engines to meet a new or accelerated engine standard, while fleet regulations necessitate that manufacturing is mature so that there is enough supply available to meet that demand. On the consumer side, additional time would be required for procurement implementation and there may be additional infrastructure

²¹ See 87 Fed.Reg. 71631 (Nov. 23, 2022).

needed to meet new requirements. Thus, measures that require fleet turnover or new engine standards are not appropriate to be used as a triggered contingency measure.

CARB regulations are also technology-forcing, which makes it difficult to amend regulations or pull compliance timelines forward with only 1-2 years notice as industry needs time to plan, develop, and implement these new technologies. It would be infeasible to require industry to turn over their fleets within one year if the technology is not readily available at a reasonable cost. CARB regulations are also the most stringent air quality control requirements in the country, so there are few opportunities to require additional stringency. CARB is driving sources under our authority to zero-emission everywhere feasible to ensure attainment of air quality standards across the State, and to support near-source toxics reductions and climate targets. However, the zero-emissions targets also eliminates opportunities for contingency.

Lastly, many of CARB's options for a contingency measure would require a full rulemaking process and would not be adopted by CARB, received an Act waiver/authorization, and approved by U.S. EPA within the timeframe specified, making many of the options infeasible. Based on the U.S. EPA FIP timeline, CARB staff would need to find a measure that could realistically be adopted and approved by U.S. EPA within the next year. However, most CARB measures must go through a regulatory process for adoption that can take approximately five years from start to finish.

Table 51. Assessment of Potential CARB Contingency Measures

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Light-Duty Passenger Vehicles and Light-Duty Trucks	Advanced Clean Cars Program (I and II), including the Zero Emission Vehicle (ZEV) Regulation	Amended 8/25/22 Requires 100% ZEV new vehicle sales by 2035 and increasingly stringent standards for gasoline cars and passenger trucks.	Pulling compliance timelines forward. Setting more stringent standards.	No; standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or manufacturing requirements within 60 days and achieve reductions within one year.	No; current standards and requirements are technology forcing and most stringent in the nation, including a zero-emission requirement. Further stringency would not be feasible.
	Clean Miles Standard	Adopted 5/20/21 Set eVMT (electric miles traveled) and greenhouse gas (GHG) requirements for Transportation Network Companies (TNCs).	Pulling forward timeline to achieve 100% eVMT.	No; standards and fleet requirements need lead time to be implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; zero-emissions technology requirement is most stringent standard; TNCs are only a small portion of on-road vehicles, depending on area, may not achieve many reductions.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	On Board Diagnostics II (OBD)	Amended July 22, 2021 Required updates to program to address cold start emissions and diesel particulate matter (PM) monitoring. Many of the regulatory changes included phase-ins that are not 100% until 2027.	Removing or pulling phase-in timelines forward. Setting more stringent OBD requirements.	No; OBD requirements need significant lead time to be developed, adopted, and implemented; infeasible to fully implement new requirements within 60 days and achieve similar reductions within one year.	No; the OBD requirements require sufficient lead time to implement with significant development time needed for hardware/ software changes and verification/validation testing.
	California Smog Check Program	Amended 2010 via legislation Smog Check Program enhancements, including new technologies and test methods.	Change the exemptions from 8 to 7 and/or 6 model years. Require annual Smog Check. Require annual Smog Check for only high mileage vehicles.	Yes (changing the exemptions) because it is not a regulatory change; No (other options); Smog Check requirements need significant lead time to be developed, adopted, and implemented; infeasible to fully implement new requirements within 60 days and achieve similar reductions within one year.	Yes (changing the exemptions) and would not have disproportionate impacts; Yes (other options), but would disproportionately impact low-income populations and disadvantaged communities.
	Reformulated Gasoline	Amended May 2003 Required removal of methyl tert-butyl ether (MTBE) and included refinery limits and cap limits.	Require more stringent standards. Change cap limits and refinery limits.	No; fuel standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; current standards and requirements are some of most stringent in the world; not feasible to require further stringency of specifications and develop or manufacture in a compressed timeline.
Motorcycles	On-Road Motorcycle Regulation*	Proposed hearing: 2023 May require exhaust emissions standards (harmonize with European standards), evaporative emissions standards, and Zero Emission Motorcycle sales thresholds.	Pulling compliance timelines forward. Require more stringent emissions standards.	No; standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; Any increase to the stringency of proposed standards would require an additional 1 to 2 years of lead time for 1) CARB staff to evaluate feasibility, and 2) manufacturers to develop and certify compliant motorcycles.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Medium Duty-Trucks	Clean Diesel Fuel	Amended 2013 Established more stringent standards for diesel fuel.	Require more stringent fuel standard.	No; fuel standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; infeasible to require more stringent standards in compressed timeline.
	Heavy-Duty Engine and Vehicle Omnibus Regulation	Adopted 8/27/20 Established new low NOx and lower PM tailpipe standards and lengthened the useful life and emissions warranty of in-use heavy-duty diesel engines.	Require more stringent standard, make optional idling standard required. Update testing requirements or corrective action procedures.	No; standards need years of lead time to be implemented; infeasible to implement new sales requirement within 60 days and achieve reductions within one year.	No; infeasible to require more stringent standards in compressed timeline.
	Advanced Clean Trucks Regulation	Adopted 6/25/20 Established manufacturer zero-emission truck sales requirement and company and fleet reporting.	Move up timeline for ZEV sales requirement. Reduce threshold for compliance.	No; manufacturer sales requirements need years of lead time to be implemented; infeasible to implement new sales requirement within 60 days. Sales requirement would not happen immediately or within one year of trigger; infeasible to achieve reductions within one year.	No; current sales requirement is technology forcing and most stringent in the nation.
	Advanced Clean Cars Program (I and II), including the Zero Emission Vehicle Regulation	Amended 8/25/22 Requires 100% ZEV new vehicle sales by 2035 and increasingly stringent standards for gasoline cars and passenger trucks.	Pulling compliance timelines forward. Setting more stringent standards.	No; standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or manufacturing requirements within 60 days and achieve reductions within one year.	No; current standards and requirements are technology forcing and most stringent in the nation, including a zero-emission requirement. Further stringency would not be feasible.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Advanced Clean Fleets Regulation	Adopted 4/27/23 Establishes zero-emission purchasing requirements for medium- and heavy-duty vehicle fleets (including state and local agencies, and drayage fleets, high priority, and federal fleets); would also require 100% zero-emission new vehicle sales starting 2040.	Pulling compliance timelines forward. Reduce threshold for compliance.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year. Because of near term compliance deadlines, moving forward deadlines would not result in many reductions.	No; current fleet requirements are technology forcing and most stringent in the nation, eventually requiring zero-emissions only.
Heavy-Duty Trucks	Heavy-Duty Low NOx Engine Standards	See Omnibus.	More stringent standards were set with Omnibus Regulation.	No; engine standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; infeasible to require more stringent technology forcing standards in compressed timeline if technology/ alternatives are not widely available.
	Optional Low-NOx Standards for Heavy-Duty Diesel Engines	Amended 8/27/20 as a part of Omnibus to lower the optional low NOx emission standards for on-road heavy-duty engines.	Make option required.	No; engine standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; infeasible to require more stringent technology forcing standards in compressed timeline if technology/ alternatives are not widely available.
	Heavy-Duty Inspection and Maintenance Regulation	Adopted 12/9/21 Requires periodic vehicle emissions testing and reporting on nearly all heavy-duty vehicles operating in California.	Increase frequency of testing.	No; increased I/M requirements need significant lead time to be developed, adopted, and implemented; infeasible to fully implement new requirements within 60 days and achieve similar reductions within one year.	Yes, but costs would disproportionately impact small businesses and low-income populations.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Heavy-Duty OBD	Amended July 22, 2021 Required updates to program to address cold start emissions and diesel PM monitoring. Many of the regulatory changes included phase-ins that are not 100% until 2027.	Removing or pulling phase-in timelines forward. Setting more stringent OBD requirements.	No; OBD requirements need significant lead time to be developed, adopted, and implemented; infeasible to fully implement new requirements within 60 days and achieve similar reductions within one year.	No; the OBD requirements require sufficient lead time to implement with significant development time needed for hardware/ software changes and verification/validation testing.
	Heavy-Duty Engine and Vehicle Omnibus Regulation	Adopted 8/27/20 Established new low NOx and lower PM Standards and lengthened the useful life and emissions warranty of in-use heavy-duty diesel engines.	Require more stringent standard, make optional idling standard required. Update testing requirements or corrective action procedures.	No; standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or sales requirements within 60 days and achieve reductions within one year.	No; infeasible to require more stringent technology forcing standards in compressed timeline.
	Cleaner In-Use Heavy-Duty Trucks (Truck and Bus Regulation)	Adopted 12/17/10 Requires heavy-duty diesel vehicles that operate in California to reduce exhaust emissions. By January 1, 2023, nearly all trucks and buses will be required to have 2010 or newer model year engines to reduce PM and NOx.	None	-	-
	Zero-Emission Powertrain Certification Regulation	Adopted 12/6/19 Establishes certification requirements for zero-emission powertrains.	None	-	-

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Advanced Clean Trucks Regulation	Adopted 6/25/20 Established manufacturer zero-emission truck sales requirement and company and fleet reporting.	Move up timeline for ZEV sales requirement. Reduce threshold for compliance.	No; manufacturer sales requirements need years of lead time to be implemented; infeasible to implement new sales requirement within 60 days. Sales requirement would not happen immediately or within one year of trigger; infeasible to achieve reductions within one year.	No; current sales requirement is technology forcing and most stringent in the nation.
	Advanced Clean Fleets Regulation	Adopted 4/27/23 Establishes zero-emission purchasing requirements for medium- and heavy-duty vehicle fleets (including state and local agencies, and drayage fleets, high priority, and federal fleets); would also require 100% zero-emission new vehicle sales starting 2040.	Pulling compliance timelines forward. Reduce threshold for compliance.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year. Because of near term compliance deadlines, moving forward deadlines would not result in many reductions.	No; current fleet requirements are technology forcing and most stringent in the nation, eventually requiring zero-emissions only.
Heavy-Duty Urban Buses	Innovative Clean Transit	Adopted 12/14/2018 Requires all public transit agencies to gradually transition to a 100% zero-emission bus fleet.	Move compliance timelines forward. Remove various exemptions or compliance options.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year.	No; current requirements are technology forcing and most stringent (zero-emission requirement). Further stringency is not possible; expediting timelines would not be feasible.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Advanced Clean Fleets Regulation	Adopted 4/27/23 Establishes zero-emission purchasing requirements for medium- and heavy-duty vehicle fleets (including state and local agencies, and drayage fleets, high priority, and federal fleets); would also require 100% zero-emission new vehicle sales starting 2040.	Pulling compliance timelines forward. Reduce threshold for compliance.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year. Because of near term compliance deadlines, moving forward deadlines would not result in many reductions.	No; current fleet requirements are technology forcing and most stringent in the nation, eventually requiring zero-emissions only.
Other Buses, Other Buses - Motor Coach	Zero-Emission Airport Shuttle Regulation	Adopted 6/27/19 Requires airport shuttles to transition to zero-emission fleet.	Pull compliance timelines forward. Remove reserve airport shuttle exemption.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year.	No; current requirements are technology forcing and most stringent (zero-emission requirement). Further stringency is not possible. Not many shuttles in area, would not achieve many reductions.
	Advanced Clean Fleets Regulation	Adopted 4/27/23 Establishes zero-emission purchasing requirements for medium- and heavy-duty vehicle fleets (including state and local agencies, and drayage fleets, high priority, and federal fleets); would also require 100% zero-emission new vehicle sales starting 2040.	Pulling compliance timelines forward. Reduce threshold for compliance.	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing requirements within 60 days. Purchasing requirement and turnover would not happen immediately; infeasible to achieve reductions within one year. Because of near term compliance deadlines, moving forward deadlines would not result in many reductions.	No; current fleet requirements are technology forcing and most stringent in the nation, eventually requiring zero-emissions only.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Commercial Harbor Craft	Commercial Harbor Craft (CHC) Regulation	Amended 3/24/22 Established more stringent standards, all CHC required to use renewable diesel, expanded requirements, and mandates zero-emission and advanced technologies.	Set more stringent standards. Pull compliance timelines forward.	No; Technology requirements and standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard or requirements within 60 days and achieve reductions within one year.	No; standards set are technology forcing and most stringent; not technologically feasible to require increased stringency in compressed timeline.
Recreational Boats	Spark-Ignition Marine Engine Standards*	Proposed hearing: 2029 Would establish catalyst-based emission standards and percentage of zero-emission technologies for certain applications.	Set more stringent standard.	No; standards need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; standards being set will be most stringent feasible, including zero-emission requirement); would not save a more stringent standard for contingency
Transport Refrigeration Units	Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRUs) (Parts I and II*)	Amended 2/24/22 (Part I), Part II proposed CARB hearing in 2025 Requires diesel-powered truck TRUs to transition to zero-emission, PM emission standard for newly manufactured non-truck TRUs. Part II would establish zero-emission options for non-truck TRUs.	Set more stringent standards. Pull compliance timelines forward	No; standards and fleet requirements need years of lead time to be implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; current requirements are technology forcing and most stringent (zero-emission requirement). Further stringency is not possible; expediting timelines would not be feasible; would not save a more stringent standard for contingency
Industrial Equipment	Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation	Amended July 2016 Extended recordkeeping requirements, established labeling, initial reporting, and annual reporting requirements.	Set more stringent performance standards	No; standards and fleet requirements need years of lead time to be implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; Infeasible to require further stringency within one year given timeline for technology development and certification. See Zero-Emission Forklifts below.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Off-Road Regulation	Amended 11/17/22 Requires phase out of oldest and highest-emitting engines, restricts addition of Tier 3 and 4i engines, mandates renewable diesel for all fleets.	Pull phase-out or compliance timelines forward	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing and turnover requirements within 60 days and achieve reductions within one year.	No; Infeasible to require further stringency within one year given timeline for technology development and certification.
	Zero-Emission Forklifts*	Proposed CARB hearing in 2023. Would require model-year phase-out and reporting requirements and manufacturer sales restrictions.	Pull phase-out or compliance timelines forward	No; standards requirements need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; standards being set will be technology forcing and most stringent feasible, including zero-emission requirement; would not save a more stringent standard for contingency
	Off-Road Zero-Emission Targeted Manufacturer Rule*	Proposed CARB hearing in 2027. Would require manufacturers of off-road equipment and/or engines to produce for sale zero-emission equipment and/or powertrains as a percentage of their annual statewide sales volume.	Pull forward compliance timelines or increase percentage sales requirements	No; Manufacturing and sales requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days and achieve reductions within one year.	No; standards being set will be technology forcing and most stringent feasible, including zero-emission requirement; would not save a more stringent standard for contingency
Construction and Mining	Off-Road Zero-Emission Targeted Manufacturer Rule*	Proposed CARB hearing in 2027. Would require manufacturers of off-road equipment and/or engines to produce for sale zero-emission equipment and/or powertrains as a percentage of their annual statewide sales volume.	Pull forward compliance timelines or increase percentage sales requirements	No; Manufacturing and sales requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days and achieve reductions within one year.	No; standards being set will be technology forcing and most stringent feasible, including zero-emission requirement; would not save a more stringent standard for contingency

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
	Off-Road Regulation	Amended 11/17/22 Requires phase out of oldest and highest-emitting engines, restricts addition of Tier 3 and 4i engines, mandates renewable diesel for all fleets.	Pull phase-out or compliance timelines forward	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing and turnover requirements within 60 days and achieve reductions within one year.	No; Infeasible to require further stringency within one year given timeline for technology development and certification.
Airport Ground Support Equipment	Zero-Emission Forklifts*	Proposed CARB hearing in 2023. Would require model-year phase-out and reporting requirements and manufacturer sales restrictions.	Pull phase-out or compliance timelines forward	No; standards requirements need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year.	No; standards being set will be technology forcing and most stringent feasible, including zero-emission requirement; would not save a more stringent standard for contingency
	Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation	Amended July 2016 Extended recordkeeping requirements, established labeling, initial reporting, and annual reporting requirements.	Set more stringent performance standards	No; standards and fleet requirements need years of lead time to be implemented; infeasible to implement new standard or purchasing requirements within 60 days and achieve reductions within one year.	No; Infeasible to require further stringency within one year given timeline for technology development and certification.
	Off-Road Regulation	Amended 11/17/22. Requires phase out of oldest and highest-emitting engines, restricts addition of Tier 3 and 4i engines, mandates renewable diesel for all fleets.	Pull phase-out or compliance timelines forward	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing and turnover requirements within 60 days and achieve reductions within one year.	No; Infeasible to require further stringency within one year given timeline for technology development and certification.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Port Operations and Rail Operations	Cargo Handling Equipment Regulation*	Proposed CARB hearing in 2025. Amendments to transition to zero-emission technology.	None	No; Standards requirements need years of lead time to be developed, certified, and implemented; infeasible to implement new standard within 60 days and achieve reductions within one year. Fully implemented in 2017 and relies on other engine standards, making it infeasible to trigger without regulatory process changing other standards.	No; Considering regulation to move towards zero-emissions. Currently assessing availability of technologies.
	Off-Road Zero-Emission Targeted Manufacturer Rule*	Proposed CARB hearing in 2027. Would require manufacturers of off-road equipment and/or engines to produce for sale zero-emission equipment and/or powertrains as a percentage of their annual statewide sales volume.	Pull forward compliance timelines or increase percentage sales requirements	No; Manufacturing and sales requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days and achieve reductions within one year.	No; standards being set will be technology forcing and most stringent feasible, including zero-emission requirement; would not save a more stringent standard for contingency
Lawn and Garden	Small Off-Road Engine (SORE) Regulation	Amended 12/9/21 Requires most newly manufactured SORE to meet emission standards of zero starting in model year (MY) 2024.	Move up implementation deadlines	No; Standards requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days. Purchasing would not happen immediately or within one year of trigger; infeasible to achieve reductions within one year.	No; current standards and requirements are a technology forcing zero-emission certification requirement. Further stringency would not be possible.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Ocean-Going Vessels	At Berth Regulation	Amended 8/27/20 Expands requirements to roll-on roll-off vessels and tankers, smaller fleets, and new ports and terminals.	Remove option to use alternate control technology or set more stringent alternate control technology requirements. Reduce threshold for 'low activity terminals' exemption.	No; control technology requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days and achieve reductions within one year.	No; regulation already requires use of shore power or alternate control technology for every visit.
	Ocean-going Vessel Fuel Regulation	Amended 2011 Extended clean fuel zone and included exemption window.	Set more stringent requirements	No; fleet requirements need years of lead time to be implemented; infeasible to implement new purchasing and turnover requirements within 60 days and achieve reductions within one year.	No; not feasible to require further stringency in a compressed timeline.
Locomotives	In-Use Locomotive Regulation	Adopted 4/27/23, Requires each operator to deposit funds into spending account for purchasing cleaner locomotive technology, sets idling limits, and requires registration and reporting. Starting in 2030, only locomotives less than 23 years old can operate in the state. Newly built passenger, switch, and industrial locomotives must operate in a zero emission configuration, and in 2035 newly built freight line haul locomotives.	Move up implementation deadlines. Set stricter idling requirements.	No; Fleet requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days and reductions within one year. No, for idling requirements.	No; current standards and requirements are technology forcing, include a zero-emission requirement. Further stringency would not be possible. No, for idling requirements, CARB is committing to re-evaluate the requirement during next assessment.

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Areawide Sources	Zero-Emission Standard for Space and Water Heaters	Proposed CARB hearing in 2025. Beginning in 2030, 100% of sales of new space heaters and water heaters would need to meet a zero-emission standard.	Set trigger for more stringent standards or timelines.	No; Standards requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days. Purchasing would not happen immediately or within one year of trigger; infeasible to achieve reductions within one year.	No; current standards and requirements are a technology forcing zero-emission certification requirement. Further stringency would not be possible.

There were few options identified for a contingency measure based on the infeasibility analysis. As previously stated, there are limitations to utilizing CARB regulations for contingency measures and CARB currently has programs in place or under development for most of these sources to reduce NO_x, ROG and PM_{2.5} emissions. However, the analysis did result in identifying the ability to utilize provisions within the Smog Check Program for a viable contingency measure, which is now being proposed.

Appendix B: Smog Check Contingency Measure Emissions Benefits Methodology

Smog Check Contingency Measure Emissions Benefits

Table 52. List of Non-Attainment Areas and Attainment Years

Standard	Area	Attainment Year
80 ppb 8-hour Ozone	San Joaquin	2023
75 ppb 8-hour Ozone	Sac Metro	2024
	Eastern Kern	2026
	West Mojave	2026
	San Diego	2026
	South Coast	2029
	Coachella Valley	2031
	SJV	2031
70 ppb 8-hour Ozone	Ventura	2026
	Western Nevada	2026
	Mariposa	2026
	Eastern Kern	2032
	Sacramento Metro	2032
	San Diego	2032
	West Mojave	2032
	South Coast	2035
	Coachella	2037
	SJV	2037
15 ug PM2.5	San Joaquin	2023
35 ug PM2.5	San Joaquin	2024
12 ug PM2.5	San Joaquin	2030
	South Coast	2030

Review Of Current Information

The Emission FACtor (EMFAC) model is California’s official emissions inventory model for on-road mobile sources. EMFAC2021 is the latest U.S. Environmental Protection Agency (U.S. EPA) approved version for use in California for State Implementation Plan (SIP) development and transportation conformity analysis²², and reflects the most recent emission and activity updates and newly adopted regulations at the time of its release. At the present time, almost the entire California vehicle fleet is subjected to the Smog Check Program and hence, in-use testing programs that inform emission rates in EMFAC2021 implicitly incorporate the emissions benefits of California’s Smog Check Program in the model output. In addition, EMFAC2021 does not have functionality to output emissions from the light-duty

²² <https://www.govinfo.gov/content/pkg/FR-2022-11-15/pdf/2022-24790.pdf>

fleet without the effects of Smog Check Program. However, an earlier version of the model, EMFAC2011, used a different modeling framework that allows users to estimate emissions impacts of the Smog Check based on user-defined program requirements specific to each NAA.²³

Unlike the latest version of the model, EMFAC2011 baseline outputs reflect emissions from a fleet without an I/M Program. Because California's Smog Check Program began in 1984, emissions data without an I/M program in EMFAC2011 were derived from U.S. EPA data collected on approximately 7,000 vehicles in Hammond, Illinois and Ann Arbor, Michigan in the 1990s before an I/M program was in effect.²⁴ CARB staff used these data for several versions of the model, up through EMFAC2011, to inform emission rates by vehicle technology group for a theoretical California fleet without an I/M program. Using data from CARB's longstanding Light-Duty Vehicle Surveillance Program (VSP), where vehicles failing the California Smog Check Program were tested before and after repairs, CARB staff adjusted baseline emission rates to reflect the benefits of having an I/M program based on requirements for each region in the State.

Approach

Since the Measure would change the current 8 model-year exemption to 7 model-years, CARB staff applied emission benefits of the change to the calendar year when vehicles would become 8 model-years old. Using this approach, all vehicles, regardless of when annual registration is due and the initial I/M Program inspections were performed during the year the vehicles turned 7 model-years old, will reflect the impacts of being initially subject to the I/M Program requirements for a full calendar year.

CARB staff used EMFAC2011 to derive the emissions impact of an I/M Program for each pollutant and vintage of vehicle newly becoming 8 model-years old in the attainment years listed in Table 52. The emissions impact is reflected as a ratio of emissions with no I/M Program relative to a baseline with an I/M program. As a fraction, this would be: (no-I/M) / (I/M), where ratios greater than one reflect the degree of emissions benefits of having an I/M program in place. CARB staff applied the ratios calculated using EMFAC2011 to the output from EMFAC2021²⁵ because the newest model represents the current California fleetwide emissions reflecting the current model year distribution, populations, accrual rates (miles driven per year), and emissions rates. The details of EMFAC2011 setup and run are provided in in the next section.

CARB staff applied the following equation:

²³ <https://www.federalregister.gov/documents/2013/03/06/2013-05245/official-release-of-emfac2011-motor-vehicle-emission-factor-model-for-use-in-the-state-of-california>

²⁴ <https://ww2.arb.ca.gov/sites/default/files/2023-03/emfac2000-ef.pdf>

²⁵ Downloaded from EMFAC2021 web database: <https://arb.ca.gov/emfac/emissions-inventory>

Benefits of removing 8-year exemption = Age 8 No-I/M emissions - Age 8 I/M emissions = (EMFAC2021 Age 8 Gasoline Vehicle Emissions²⁶ × EMFAC2011 Age 8 No-IM/IM Ratio²⁷) - EMFAC2021 Age 8 Gasoline Vehicle Emissions²⁶

For ozone nonattainment areas, the estimated benefits include NO_x and ROG in tons per day for summer season. For PM_{2.5} nonattainment areas, because EMFAC2011 does not reflect benefits from tailpipe PM emissions from the Smog Check Program, the annual NO_x and ROG emission benefits are included instead, as these are precursors to secondary PM_{2.5} formation in the atmosphere.

It should be noted that, some of CARB's recent regulations, including Advanced Clean Cars II (ACC II) and Advanced Clean Fleets (ACF) were finalized and adopted after release of EMFAC2021. Therefore, the emission benefits estimated for this Measure using EMFAC2021 do not reflect the impacts from these regulations.

Instructions For Configuring and Running EMFAC2011

1. For the "I/M" scenario, in the main menu, click "Add New Scenario".

The screenshot shows the EMFAC2011 software interface. At the top, there is a menu bar with 'MAIN' and several empty slots. Below the menu bar is a window titled 'List of Available Scenarios' with a 'No file' status in the top right corner. The window is divided into two main sections. On the left is a large empty box for the 'List of Available Scenarios'. On the right is the 'Current Scenario Data' section, which contains the following fields: 'Number: 0 of 0', 'Name:', 'Calendar Year:', 'Season:', and 'Type:'. Below these fields are several buttons: 'IM Program Parameters', 'Add New Scenario', 'Edit Scenario', 'Delete Scenario', 'Save', 'Save As...', 'Run', 'Finish Editing', and 'Cancel'.

2. Select "State", "Use Average" in "Step 1 - Geographic Area", select modeled calendar year(s) in "Step 2 - Calendar Years", Select "Summer" for ozone NAAs or "Annual" for PM NAAs in "Step 3 - Season or Month", then click "Next".

²⁶ Include all gasoline vehicle classes subject to California Smog Check Program

²⁷ Derived based on light-duty vehicle classes under 8,500 lbs. in EMFAC2011

Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season

Step 1 - Geographic Area

Area Type: State

State

Air Basin

District

County

Calculation Method

By Sub-Area

Use Average

Step 2 - Calendar Years

Select

8 calendar years in the range 2023 to 2035 selected

Step 3 -- Season or Month

Summer

Cancel

Next >

Finish

- Click "Default Title" in "Step 4 - Scenario Title for Reports", select "All" in "Step 5 - Model Years", select "Modify" in "Step 6 - Vehicle Classes" and choose "PC/T1/T2/T3" from the pop-up window, select "Default" in "Step 7 - I/M Program schedule", then click "Next".

Input 1 | Input 2 | Mode and Output | Tech/IM | CYr Basis | . | . | .

Basic scenario data - Select or Enter Scenario Title

Step 4 -- Scenario Title for Reports

Statewide totals Avg Summer 8 CYrs 2023 to 2035 Default Title

Default Title

In Emfac Impact Rate reports, titles over 40 characters will be truncated!

Step 5 - Model Years

All model years selected

All

Modify

Step 6 - Vehicle Classes

MODIFIED: 4 of 21 vehicle classes selected

All

Modify

Step 7 - I/M Program Schedule

Standard I/M schedules

Default

Modify

Cancel

< Back

Next >

Finish

- In the tab "Burden - Area planning inventory", choose "Detailed Planning Inventories (CSV)" and click "Model Yrs". Select "Output Frequency" as "Day".

Input 1 | Input 2 | Mode and Output | Tech/IM | CYr Basis | . | . | .

Burden - Area planning inventory | **Emfac - Area fleet average emissions** | Calimfac - Detailed vehicle data

Scenario Type: BURDEN
Area-Specific Planning Emissions Inventory (tons/yr)

BURDEN Inventory Files and Reports

Planning Inventory (BUR)

☐ Standard ☐ HD Detail

Detailed Planning Inventories (CSV)

MVEI7G (BCD)

Weighted Model Year Activity (WT)

CEIDARS/CFUS (CTF)

Detailed Outputs (BDN)

☒ Model Yrs ☐ Tech Groups ☐ Speeds

Output Frequency
☐ Hour ☒ Day

Output Particulate As...
☐ Total PM
☒ PM10 ☐ PM2.5

Output Hydrocarbons As...
☐ TOG ☐ THC
☒ ROG ☐ CH4

Speed categories...
☐ 1 ☐ 5 ☒ 10 MPH

Cancel < Back Edit Program Constants Finish

5. No need to change any inputs in tab "Emfac - Area fleet average emissions". Leave any inputs at the default settings.

Input 1 | Input 2 | Mode and Output | Tech/IM | CYr Basis | . | . | .

Burden - Area planning inventory | **Emfac - Area fleet average emissions** | Calimfac - Detailed vehicle data

Scenario Type: EMFAC -- Area-specific fleet average emissions (g/hr) for selected temperatures, relative humidities speeds

Configure EMFAC Outputs

Temperal

Relative Humidities

Speed...

Emfac Rate Files

Binary Impacts (BIN)

ASCII Impacts (ERP)

Summary Rates (RTS)

Detailed Impact Rates (RTL)

Output Particulate As...
☐ Total PM
☒ PM10 ☐ PM2.5

Output Hydrocarbons As...
☐ TOG ☐ THC
☒ ROG ☐ CH4

Cancel < Back Edit Program Constants Finish

6. No need to change any inputs in tab "Calimfac - Detailed vehicle data". Leave any inputs at the default settings. Click "Finish" to go back to the main menu.

Input 1 | Input 2 | Mode and Output | Tech/IM | CYr Basis | . | . | . | .

Burden - Area planning inventory | Emfac - Area fleet average emissions | Calimfac - Detailed vehicle data

Scenario Type: CALIMFAC -- Detailed vehicle data (g/mi)

CALIMFAC Bag Options

- ☐ FTP Bag 1 (g/mi)
- ☐ FTP Bag 2 (g/mi)
- ☐ FTP Bag 3 (g/mi)
- ☐ UC Bag 1 (g/trip)
- ☐ UC Bag 2 (g/mi)
- ☒ FTP Composite (g/mi)

CALIMFAC Correction Factors

- ☐ No Correction Factors

Emission Factor Files and Reports

MY Emission Factor Regressions (OUT)

- ☐ I/M ☒ No I/M ☐ Tech Group

By Calendar Year (CYW)

- ☐ I/M ☐ No I/M ☐ I/M Credits

By Model Year (MY1, MY2)

Regime Fractions (RG1-RG6)

Output Particulate As...

- ☐ Total PM
- ☒ PM10 ☐ PM2.5

Output Hydrocarbons As..

- ☐ TOG ☐ THC
- ☒ ROG ☐ CH4

Cancel < Back Edit Program Constants Finish

7. In the "MAIN" menu, save the current input by clicking "Save", then click "Run" to start the model run. Only the .bdn output file is needed for data analysis, which shows the detailed emissions output by model year, vehicle class, and fuel type.

MAIN | . | . | . | . | . | . | . | .

File: C:\emfac2011\statewide_0828_1.inp

List of Available Scenarios

01 Statewide totals Avg Summer 8 CYrs 2023 to 2035 Default Title

Current Scenario Data

Number: 1 of 1

Name: Statewide totals Avg Summer 8 CYrs 2023 to 2035 Default Title

Calendar Year: 2023

Season: Summer

Type: Calimfac

IM Program Parameters

Add New Scenario

Edit Scenario

Delete Scenario

Save

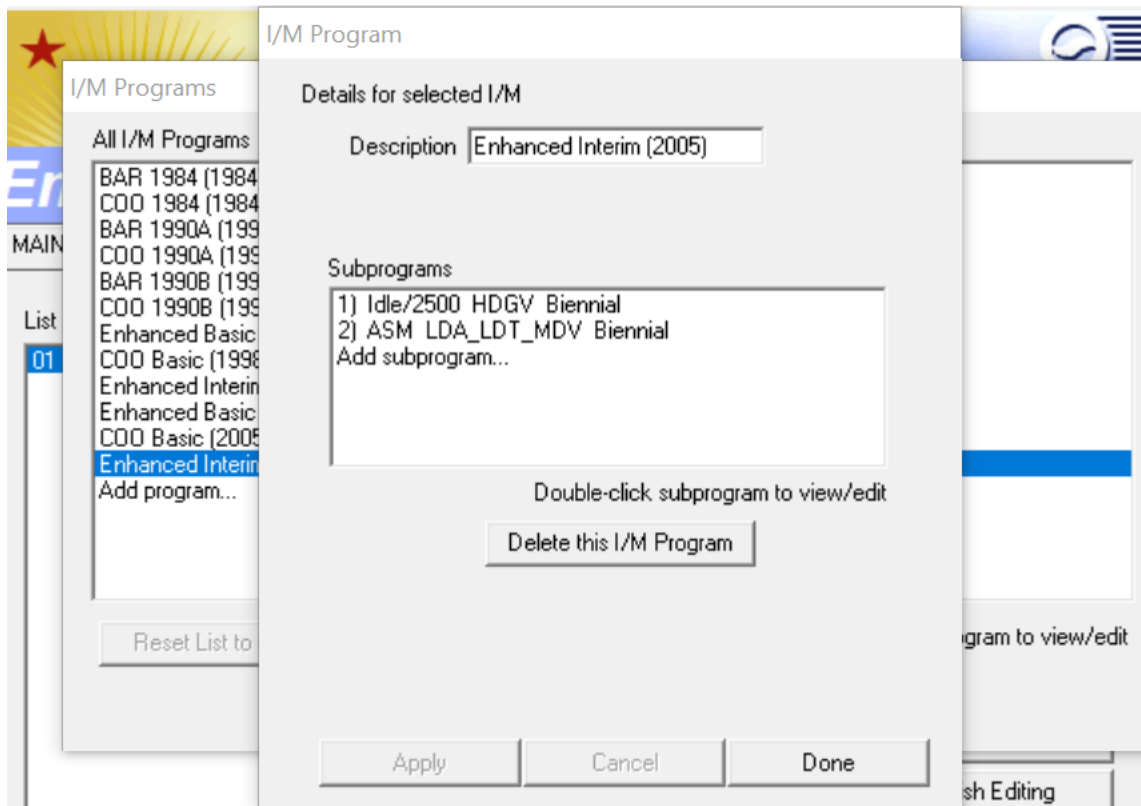
Save As...

Run

Finish Editing

Cancel

8. For "No-I/M" scenario, repeat Steps 1 to 6, except that in the main menu, click "IM Program Parameters", double click each program and delete, and click "Done" to go back to the main menu. Then proceed to Step 7 to start the model run.



Appendix C:

Carl Moyer Program Emissions Impacts Analysis Methodology

Moyer Program Emissions Reductions Estimates Methodology

CARB staff conducted analysis to determine the potential disbenefit of the Measure resulting from a potential loss in funding for the Moyer Program. If the Measure is triggered, the Moyer Program would receive less funding from fewer smog abatement fees being collected, as discussed in section 4C of this document. The calculation of the potential emissions disbenefit from losing Moyer Program funding consisted of two main components:

1. Vehicle Population
2. Moyer Program Statewide NOx Cost Effectiveness

The vehicle populations were estimated using EMFAC2021 and calculated as described in Appendix B. The statewide cost effectiveness was estimated as described in Appendix H of the Fiscal Year 2022-23 Funding Plan for Clean Transportation Incentives.²⁸

The methodology for calculating the potential emissions reductions loss is as follows:

First, CARB staff calculated the potential loss in funding by multiplying the smog abatement fee directed towards the Moyer Program of \$21 by the estimated vehicle population affected in each area for their respective attainment year. This results in the statewide total potential loss in funding if triggered in the respective area. An example calculation from a theoretical area missing attainment in 2023 is shown below.

$$\text{Total potential loss in funding resulting from an area missing attainment in 2023} = \text{Portion of smog abatement fee to Moyer} * 8\text{MYO vehicle population in nonattainment area in 2023}$$

Next, to find the area-specific foregone funding and related emission reductions, CARB staff used three years of historical Moyer Program funding allocations to local air districts to calculate the average proportion of funding typically awarded to each district. This district allocation calculation is done for each nonattainment area's corresponding local air district. An example calculation for a single local air district (District X) is shown below.

$$\text{District Allocation (\%)} = \frac{\text{Historical Average allocation to District X (\$)}}{\text{Total Carl Moyer Program Funding (\$)}}$$

The local air district allocation percentage for each area is then applied to the calculated loss in funding. This results in the potential loss in funding for each specific local air district.

²⁸ https://ww2.arb.ca.gov/sites/default/files/2022-10/proposed_fy2022_23_funding_plan_final.pdf

$$\text{Loss in funding for District X (\$)} = \text{District Allocation (\%)} * \text{Total potential loss in funding}$$

Divide the total loss in funding calculated for each area by the statewide NOx cost effectiveness and convert to tons per day. Each project is assumed to have a 10-year project life.

$$\text{Loss in reductions (tpd)} = \frac{\text{Loss in funding for District X (\$)}}{\text{statewide NOx cost effectiveness}/10/365 \left(\frac{\$}{\text{ton}} \right)}$$

The result is the total loss in potential emissions reductions for each district from foregone funding for Moyer Program projects.

Appendix D:
California Health and Safety Code § 44011(a)(4)(A) and (B)

State of California

HEALTH AND SAFETY CODE

Section 44011

44011. (a) All motor vehicles powered by internal combustion engines that are registered within an area designated for program coverage shall be required biennially to obtain a certificate of compliance or noncompliance, except for the following:

[REDACTED]

(4) (A) Except as provided in subparagraph (B), all motor vehicles four or less model-years old.

(B) (i) Beginning January 1, 2005, all motor vehicles six or less model-years old, unless the state board finds that providing an exception for these vehicles will prohibit the state from meeting the requirements of Section 176(c) of the federal Clean Air Act (42 U.S.C. Sec. 7401 et seq.) or the state's commitments with respect to the state implementation plan required by the federal Clean Air Act.

(ii) Notwithstanding clause (i), beginning January 1, 2019, all motor vehicles eight or less model-years old, unless the state board finds that providing an exception for these vehicles will prohibit the state from meeting the requirements of Section 176(c) of the federal Clean Air Act (42 U.S.C. Sec. 7401 et seq.) or the state's commitments with respect to the state implementation plan required by the federal Clean Air Act.

(iii) Clause (ii) does not apply to a motor vehicle that is seven model-years old in year 2018 for which a certificate of compliance has been obtained.

[REDACTED]

[REDACTED]

(Amended by Stats. 2017, Ch. 633, Sec. 1. (AB 1274) Effective October 10, 2017.)

**South Coast Air Basin Contingency Measure SIP Revision
for the 2015 8-Hour Ozone NAAQS**

**APPENDIX B: CARB'S AREA SOURCE INFEASIBILITY
JUSTIFICATION**

Draft CARB Contingency Measure Analysis

CARB Reactive Organic Gases Area Source Measure Analysis

CARB adopted the *California Smog Check Contingency Measure* to address contingency measure requirements throughout the State. U.S. EPA proposed to approve the *California Smog Check Contingency Measure* as a contingency measure on December 20, 2023. The Smog Check Contingency Measure, if triggered in a nonattainment area, would reduce the exemption for vehicles that are 8 model years old and newer to seven model years old and newer, thereby increasing the number of vehicles subject to Smog Check. This measure, if triggered, would achieve additional NO_x and ROG reductions beyond what is currently achieved by the Smog Check Program by identifying additional emissions control equipment failures from vehicles previously exempt.

The *California Smog Check Contingency Measure* includes, in Appendix A, analysis on the feasibility of contingency measures related to CARB's mobile source control programs that target both ROG and NO_x. CARB staff are now evaluating potential options for a contingency measure achieving ROG reductions from area sources that the State has authority to regulate, including both CARB and Department of Pesticide Regulation (DPR)'s regulations (Table 2), to determine feasibility given the contingency measure requirements under the Clean Air Act, recent court decisions and U.S. EPA draft guidance. The State currently has programs in place for these area sources and has evaluated a variety of regulatory mechanisms within existing and new programs for potential contingency triggers. Each measure was evaluated on whether it could be implemented within 60 days of being triggered and achieve the necessary reductions within 1-2 years of being triggered. Additionally, the technological feasibility of each option was considered to assess whether the measure would be technologically feasible to implement. More stringent requirements may be unavailable or economically infeasible to implement, especially in the time frame required for contingency measure implementation. Some measures aim to reduce VOC emissions as opposed to ROG emissions. However, VOC and ROG emissions are virtually equivalent. Thus, both terms are used interchangeably throughout this document.

Challenges for CARB Measures

Based on CARB's feasibility analysis, which is similar to our mobile source analysis, there are a few common components of CARB area source regulations that limit the options for contingency measures. CARB regulations that require development of new emissions control technologies or new product formulations require a long lead time for implementation. Manufacturers would need lead time to research, plan, certify, manufacture, and deploy lower-emitting alternatives to meet a new or accelerated standard.

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Additionally, consumer-based regulations necessitate that manufacturing is mature so that there is enough supply available to meet the additional demand. On the consumer side, additional time would be required for procurement implementation based on the new requirements. Thus, measures that require product turnover, new standards or reformulation are not appropriate to be used as a triggered contingency measure given the compressed timeline required for contingency.

CARB regulations are also technology-forcing, which makes it difficult to amend regulations or pull compliance timelines forward with only 1-2 years notice as industry needs time to research, plan, develop, and implement these new technologies and product formulations. It would be infeasible to require industry to purchase and install large numbers of new control technologies within one year if the technology is not readily available at a reasonable cost. CARB regulations are also the most stringent air quality control requirements in the country, so there are few opportunities to require additional stringency. CARB is driving sources under our authority to near-zero and zero-emissions everywhere feasible to provide for attainment of air quality standards across the State, and to support near-source toxics reductions and climate targets. However, these targets which are already being addressed in many CARB regulations also eliminate opportunities for a contingency measure.

Lastly, many of CARB's options for a contingency measure would require a full rulemaking process and would not be adopted by CARB and approved by U.S. EPA within the timeframe needed, making many of the options infeasible. Given U.S. EPA failure to submit and disapproval actions for the 75 ppb 8-hour ozone standard, sanction clocks have started and sanctions could be triggered in San Joaquin Valley, Coachella Valley, Mojave Desert and the Sacramento region in 2024. As such, CARB and these local air districts need to identify measure(s) that could realistically be adopted and submitted to U.S. EPA prior to that time. However, most CARB measures must go through a regulatory process that can take approximately five years from beginning development of a regulation to it being adopted by the CARB Board.

Based on CARB staff analysis, no additional measures were identified at this time to serve as a contingency measure to reduce ROG emissions beyond the California Smog Check Contingency Measure. More detail on the CARB staff analysis, including potential emission reduction options for each area source category are described in the following sections.

Consumer Products

Consumer products refer to chemically formulated products used by household and institutional consumers, such as detergents, personal care and cosmetics products, home

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and garden products, and disinfectants. CARB regulations for consumer products aim to reduce the amount of VOCs, toxic air contaminants, and greenhouse gases that are emitted from using these consumer products.

CARB is actively seeking further emission reductions to support ozone attainment in the South Coast and elsewhere in California. Towards this end, CARB's 2022 State SIP Strategy includes a consumer products statewide emissions reduction commitment of 20 tons per day (tpd) of VOCs.

To achieve the 20 tpd VOCs emission reduction, CARB staff anticipates casting a wide net in its review of product categories. CARB staff plans to launch a survey in early 2024 to collect sales and formulation data for products sold recently in California. Survey data will identify opportunities to further reduce ozone formation from consumer products. Staff expects to bring regulatory proposals to the Board by 2027.

The Consumer Products Rulemaking Process

In granting CARB authority to regulate consumer products, which were previously regulated by local air pollution control districts and air quality management districts, it was the Legislature's intent to have a single set of regulatory requirements applicable statewide, rather than a patchwork of regulations. CARB's Consumer Products Regulation applies statewide.

For any consumer products rulemaking, proposed amendments are the culmination of a multi-year public process by CARB to identify the most promising, technically-sound strategies to effectively help California meet its air quality challenges. The recent 2021 rulemaking took close to seven years and included the following three phases of regulatory development: 1) development and implementation of the three-year survey; evaluation and publication of 2013 through 2015 Consumer and Commercial Products Survey data; 2) evaluation of potential regulatory strategies based upon the survey data; and 3) development and refinement of Proposed Amendments.

Manufacturers need lead time to reformulate existing products to meet new VOC standards. Based on previous rulemakings, five significant milestones exist and are associated with reformulating products to meet new consumer product regulatory requirements: 1) research and development; 2) efficacy testing; 3) stability testing; 4) safety testing; and 5) consumer acceptance testing. In addition, manufacturers must make modifications to product labels. While there is some opportunity for manufacturers to run these processes concurrently, often a problem in any one of these milestones require the manufacturer to start the process again.

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When setting technology forcing standards, CARB may provide for a Technical Assessment prior to effective dates. This enables CARB to assess progress made by manufacturers in developing complying products. In cases where product development challenges result in infeasibility of timely implementation, the assessment could result in amendments to the standards or to extensions in compliance deadlines.

Additionally, technology forcing standards often require modifications to facilities, equipment, and manufacturing processes. This would be the case if a product is reformulated to use compressed gas propellant instead of liquefied gas propellant. Use of compressed gas propellant requires the purchase and installation of new equipment and modifications to facility assembly lines, necessitating sufficient lead time for implementation as well as certainty about implementation dates for the technology forcing standards. CARB staff will be evaluating increased use of compressed gas propellant for the upcoming consumer product rulemaking.

Trigger Feasibility

To provide reductions qualifying for contingency purposes, CARB would need to adopt regulatory amendments which yield emission reductions that could be implemented within a short period of time from a triggering event.

For a given product category for which CARB proposes more stringent VOC standards, CARB cannot call for earlier implementation of those standards for contingency purposes. This is because CARB already requires implementation under short timelines to maximize air quality benefits in support of expeditious attainment of ambient air quality standards.

Neither can CARB set lower limits for products that would be produced and warehoused, but not sold unless a triggering event occurred. Warehousing of “contingency” products would be cost prohibitive for manufacturers and would not provide the Consumer Products Program with the maximum feasible air quality benefits, as required by the Legislature. Some consumer products also have limited shelf life and given the uncertainty of when a triggering event may occur, such an approach is not feasible.

Technological Feasibility

The Legislature, in Health and Safety Code (H&SC) Section 41712(b)(2) and 41712(d), stipulates that CARB’s consumer product regulations must set standards which are commercially and technologically feasible. Therefore, during every consumer products rulemaking, CARB sets VOC limits that are the most technologically and commercially feasible at the time.

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CARB's Consumer Products Regulation does not require lower VOC content products in some parts of California, which could then be required in other parts of California in need of contingency reductions.

When proposing more stringent VOC standards, CARB cannot establish two increasingly restrictive sets of VOC limits: one limit in support of attainment, which would go into place by a defined date; and a second, more stringent limit which would only be implemented if contingency needs were triggered. This is because: (1) State law, stated in H&SC section 41712(b)(1), requires CARB to adopt the most stringent feasible standards for attainment purposes; and (2) further reductions from consumer products are needed for attainment of ozone ambient air quality standards.

Neither could CARB set a single, more restrictive VOC standard, implement those requirements, and then hold back a portion of the anticipated emission reductions for contingency purposes while still dedicating the majority of accruing reductions towards attainment targets. In such a case, additional actual emission reductions would not occur if contingency requirements were triggered. This approach would therefore not satisfy requirements for contingency reduction.

Even if no further VOC reductions were needed for attainment, setting more stringent standards for contingency purposes would still not be a viable undertaking. This is because the testing and development of lower VOC products meeting more stringent standards could take years and much investment by manufacturers. Timelines would not mesh with the quick turnaround time needed for contingency reductions. In short, CARB cannot require development of new consumer products just in case additional emission reductions are needed. This means CARB cannot produce contingency reductions by setting more stringent standards for consumer product categories other than those which CARB would regulate further to secure the 20 tpd VOC emission reduction target for attainment purposes.

Further, CARB cannot, when seeking reductions in the very near-term (and consistent with contingency reduction timelines), rely on other jurisdictions whose regulations are resulting in lower-emitting consumer products which they could then offer for sale in California. California's Consumer Products Program is world-leading, cutting-edge and technology forcing. Manufacturers have not already developed products, and marketed them elsewhere, which they could direct to California in case a need for contingency reductions is triggered.

In summary, a consumer product contingency measure seeking additional emission reductions either by setting more restrictive standards, or by accelerating effective dates of standards, is infeasible.

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Oil and Gas

For decades, air districts with significant oil production have adopted and implemented rules designed to reduce criteria pollutant precursor emissions from the oil and gas sector to meet national ambient air quality standards (NAAQS) and Clean Air Act requirements. The air district rules control emissions of reactive organic gases (ROG) from tanks, separators, and compressors, and specify requirements for leak detection and repair (LDAR). The air district rules do not cover methane specific sources.

In 2017, CARB adopted the Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (also known as the Oil and Gas Methane Regulation) to address methane emissions from equipment and processes not already controlled for ROG purposes by existing air district rules. Although the Oil and Gas Methane Regulation is intended to reduce methane emissions, many of the covered sources also emit ROG as co-pollutants, and therefore the regulation also reduces ROG emissions. Only four air districts in California with nonattainment areas have oil and gas equipment subject to the regulation: Sacramento Metropolitan Air Quality Management District, San Joaquin Valley Air Pollution Control District, South Coast Air Quality Management District, and Ventura County Air Pollution Control District. The air district rules and the Oil and Gas Methane Regulation complement one another and together reduce ROG emissions from California's oil and natural gas sector.

Starting in 2012, U.S. EPA established regulations to reduce air pollution from the oil and natural gas industry consisting of new source performance standards. U.S. EPA also promulgated a Control Techniques Guideline in 2016 for the Oil and Natural Gas Industry which requires all states with applicable nonattainment areas to meet the prescribed levels of control in order to satisfy reasonably available control technology requirements. The CTG requirements are met in California via air district rules and CARB's submittal of the Oil and Gas Methane Regulation. In December 2023, U.S. EPA finalized updated regulations for the oil and natural gas industry including more stringent new source performance standards and, for the first time, Emissions Guidelines. U.S. EPA's recent Emissions Guidelines will require that CARB amend the Oil and Gas Methane Regulation to meet the more stringent requirements.

Methane and ROG emissions can originate from oil and gas infrastructure when natural gas is either intentionally released ("vented" emissions) or unintentionally leaked ("fugitive" emissions). Intentional releases can occur due to process designs (e.g., as a fluid to operate pneumatic devices), for safety or maintenance reasons, or for when no other control or disposal options exist (where allowed). Unintentional leaks can occur due to factors such as defects or wear in connections, valves, seals, and similar mechanisms, or due to process

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upsets, system malfunctions, or human error. Vented emissions can be controlled primarily by replacing equipment with lower-emitting models or adding vapor collection systems to equipment, and the further controls that will be required under the recent U.S. EPA Emissions Guidelines represent all controls that are technologically feasible. Fugitive emissions are addressed through leak detection and repair (LDAR) to find and fix unintentional leaks. In each of these areas, there are no additional available feasible control measures that could meet the requirements of a contingency measure.

First, there are not currently any additional measures in the Oil and Gas Methane Regulation that could be triggered without undertaking amendments to the regulation. The process for amending a regulation takes years to complete and requires the development of new measures, stakeholder engagement, and the formal regulatory process itself.

Second, even if the length of the regulatory process were not a barrier, no available surplus emission reductions could reasonably be implemented within the short timeframe required upon a triggering event. Implementation of additional controls requires at least two to three years for oil and gas facilities to comply with. New controls are not easily installed on equipment and would take additional time to upgrade, which likely does not fit in the contingency timeline required. Each of the potential emission reduction mechanisms in the Oil and Gas Methane Regulation are analyzed below:

- Reduce venting through equipment replacement or vapor control (control venting emissions):
 - The Oil and Gas Methane Regulation already includes strict venting standards for most categories of equipment designed to vent natural gas as part of normal operation. The areas where further control of vented emissions may be feasible are all being addressed by U.S. EPA's Emissions Guidelines (finalized December 2023), which are standards that CARB must meet for existing sources to demonstrate compliance with the Clean Air Act; these are measures that must be implemented and cannot be held in reserve for use as triggered contingency measures. These include banning all associated gas venting, requiring all pneumatic controllers to be zero-emission, and requiring minimization of emissions from liquids unloading to the greatest extent possible.
- Expand/increase LDAR (control fugitive emissions):
 - Under the Oil and Gas Methane Regulation, LDAR is already mandated on a quarterly basis using a very sensitive methodology (U.S. EPA's Method 21). The only exemption that results in a significant number of sources not being subject to LDAR is for equipment handling exclusively heavy oil¹, which is not

¹ Oil with an API gravity of less than 20.

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economically feasible to control based on analysis using currently available data.

In summary, there are no new technologically feasible control measures that CARB can implement in the Oil and Gas Methane Regulation that could meet the triggering timelines and other requirements, and are available to use as contingency measures.

Petroleum Marketing – Vehicle Refueling

Vapor recovery systems are installed at gasoline dispensing facilities (GDFs) to collect, contain, and return gasoline vapors that would otherwise escape into the atmosphere. Gasoline vapor emissions contain smog forming volatile organic compounds (VOCs) that are controlled in two phases at GDFs. Phase I vapor recovery collects vapors displaced from a storage tank when a cargo tank truck delivers gasoline. Phase II vapor recovery collects and stores vapors displaced during the transfer of gasoline from the GDF storage tanks into the vehicle tank. Stored gasoline vapors in the GDF tanks are then transferred into gasoline cargo tank trucks during Phase I activities and returned to gasoline terminals for processing. CARB regulations establish statewide performance standards for vapor recovery systems that must be achieved during the transfer and storage of gasoline. In addition, all vapor recovery systems must undergo CARB certification tests to demonstrate compliance with applicable performance standards before those systems can be sold, offered for sale, or installed in California.

Vapor recovery system performance standards for GDFs have become more stringent over the years. Since 2001, CARB has adopted over a dozen significant advancements as part of the Enhanced Vapor Recovery (EVR) program. Phase I EVR requires more durable and leak-tight components, along with an increased collection efficiency of 98%. Phase II EVR includes three major advancements: (1) dispensing nozzles with less spillage and required compatibility with ORVR (onboard refueling vapor recovery) vehicles, (2) a processor to manage the headspace pressure within the GDF storage tank, and (3) an in-station diagnostic (ISD) system that provides warning alarms to alert a GDF operator of potential vapor recovery system malfunctions. Phase I EVR was fully implemented in 2005 and Phase II EVR was fully implemented by 2011.

Additionally, CARB's air toxic control measure for benzene requires retail GDFs to install Phase I and Phase II systems to reduce public exposure. Exceptions to the measure include gasoline (1) dispensed from or transferred to a storage tank with a capacity less than 260 gallons, (2) dispensed to implements of animal husbandry; or (3) dispensed to vehicles with fuel tanks less than 5 gallons capacity.

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Since the implementation of Phase I and Phase II EVR in 2011, CARB staff has made additional improvements to the vapor recovery program. For GDF equipped with underground storage tanks, a total of four regulatory amendments were completed between 2011 and 2023 to strengthen performance standards, adjust implementation dates to reflect evolving technology, clarify dimension requirements for nozzles and vehicle fill pipes, and improve cost effectiveness for system upgrade requirements. Two of the most recently implemented control measures, hose permeation and more stringent nozzle spillage standard, are described below.

- Hose Permeation Standard:

CARB adopted performance standards for gasoline dispensing hose permeation on July 26, 2012. The intent of this standard is limiting the amount of gasoline that permeates through the dispensing hose. Hose permeation performance standards only apply to hoses in which liquid gasoline contacts the outer hose wall, specifically: Phase II vacuum assist and conventional hoses (latter are installed in facilities that are exempt from Phase II because they fueled predominately vehicles equipped with ORVR). Existing facilities subject to the performance standard were allowed four years from the effective date to attain compliance. The effective date is defined as the date when the first dispensing hose meeting the performance standard is certified by CARB.

The first conventional and vacuum assist hoses that met the new permeation standard were certified by CARB on June 10, 2014, and September 24, 2014, respectively. These certification dates establish the effective dates and associated four-year periods (commonly referred to as “the four-year clock”) for existing subject GDFs to comply. Existing GDFs that used conventional hoses and vacuum assist hoses had until June 10, 2018, and September 24, 2018, respectively to comply with the low permeation hose standard. New GDFs constructed after the effective dates that use vacuum assist or conventional hoses are required to install low permeation hoses at the time of construction.

- More Stringent Nozzle Spillage Standard:

In April 2015, CARB adopted new performance standards and specifications for Enhanced Conventional (ECO) nozzles that are installed at non-retail GDFs, which are exempt from Phase II requirements by district rules. These GDFs fueled predominantly vehicles that are equipped with ORVR, which collects displaced vapor during vehicle refueling.

CARB staff have compiled and evaluated mass emission factors for nozzle spillage based on CARB certification test data for three EVR nozzles and two ECO nozzles. In April 2020,

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staff found that the mass emission factors based on certification data for all five nozzles are substantially lower than applicable performance standards. This finding demonstrated nozzles are performing much better than predicted for EVR implementation at the time CARB adopted the EVR regulations.

Consequently, in December 2020, the Board approved a more stringent performance standard of 0.05 lbs/kgal for nozzle spillage for both EVR and ECO nozzles to preserve emission reductions that are already occurring and prevent emissions from increasing.

Recent analysis indicates that CARB certified vapor recovery systems designed for use at GDFs are well over 90% effective² in reducing VOC emissions that would otherwise be emitted to the atmosphere. Given the maturity and robustness of the program and the stringency of existing control measures that have been implemented statewide, there are no available additional control measures that would be feasible to implement within the timeframes required for contingency measures. Even if more stringent control measures could be adopted, they would not be able to be implemented in the contingency timeframe required as manufacturers and retailers would need more than two years of lead-time, as has been provided in the past, to comply with new standards.

CARB staff believes future amendments will improve existing test procedures and ease the burden of compliance for GDF operators without causing any increase in emissions or costs. Further, absent any changes to vapor recovery controls, CARB staff expects that gasoline vapor emissions will track proportionally to fuel dispensed. As California transitions to more fuel-efficient vehicles, zero emission vehicles, and alternative fuel sources, gasoline consumption and associated vapor emissions are expected to decrease. However, as long as gasoline remains a major fuel source, CARB will need to maintain an active and effective vapor recovery program.

In summary, California has the most comprehensive vapor recovery program applicable to GDFs in the country, and there are no new technologically feasible control measures that could meet the triggering timelines and other requirements, and are available to use as contingency measures. California's program includes:

1. rigorous performance standards for Phase I transfer, Phase II transfer, In-Station Diagnostic systems, hose permeation, storage tank pressure management, and nozzle spillage,
2. strong enforcement of performance standards by local air districts, and

² https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2023/vapor_recovery_2023/isor.pdf

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3. going well beyond US EPA's Stage I (Phase I in California), which is the sole focus of US-EPA's vapor recovery requirements.

Going forward, the vapor recovery program will remain an important part of California's efforts to control regional ozone levels and reduce public exposure to benzene.

Petroleum Marketing – Cargo Tanks

In California, gasoline vapor emissions are controlled to reduce emissions of air pollutants, specifically VOCs and various toxic air contaminants (TACs) such as benzene. Emissions are controlled during the transfer of gasoline from storage tanks at refineries or terminals/bulk plants to tanker trucks also called cargo tanks (CTs). Cargo tanks transport gasoline to service stations also called GDFs. The Cargo Tank Vapor Recovery Program (CTVRP) regulations require annual testing of CTs to ensure that they do not exceed the allowable leak rate. Such tests are performed by CT owner/operators or independent testing contractors. Test results are submitted to CARB CTVRP staff for review and provide the basis for issuing a certification document with a decal, which must be renewed annually. To ensure the integrity of the program, CTVRP staff monitors the testing conducted by CT owners, operators, and contractors. Additionally, CTVRP staff perform random inspections and testing of CTs. Also, loading facilities are prohibited from transferring gasoline to CTs with invalid or expired certifications. Because of the severe and unique air pollution problems facing California, CARB's gasoline vapor control standards for CTs are more stringent than comparable federal standards.

CARB first adopted the cargo tank vapor recovery certification regulations on April 18, 1977. These regulations established a five-minute static pressure test with an allowable leak rate to prevent excessive gasoline vapor emissions and a one-minute test for CARB inspectors to monitor CTs loaded with gasoline. There have been six amendments to this regulation (1984, 1995, 1998, 2013, 2017, 2023). These amendments were mostly administrative in nature. However, the 1995 amendment reduced the allowable leak rate by 50%, making the CTVRP the strictest emission standards in the nation.

Altering of a CT design to control emissions would require input and approval from federal agencies such as Department of Transportation (DoT) and U.S. EPA, along with State agencies such as State Fire Marshal and California Highway Patrol. Getting such approval to implement new controls may take years due to the cumbersome approval process. The CTVRP already requires more stringent emission standards than the U.S. EPA. The current CARB and U.S. EPA standard is measured in Inches of Water Column (WC"). As an example, a cargo tank in California is not allowed to leak more than 0.5 WC" (0.018psi) in a five-minute test. CTs are as vapor tight as the current industry standards and design allows for.

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There is currently no design or technology that can reduce this number. Additionally, as mentioned, design alterations would require numerous and lengthy federal, State(s), and local municipalities approvals. Implementation of any new standards would also require long lead times to deploy new technologies and would likely take more than two years. As the population of zero emission vehicles increases on California roads, emissions from CTs will be reduced due to a decline in demand for gasoline.

In summary, due to the timelines involved in development of technology, altering CT designs, and anticipated drop in gasoline demand, there are no new technologically feasible control measures in the CTVRP that could meet the triggering timelines and other requirements, and are available to use as contingency measures.

Portable Fuel Containers (Gas Cans)

Portable Fuel Containers (PFCs), or gas cans, are used to fill a variety of equipment, including lawnmowers, vehicles, and personal watercraft. However, spillage and evaporative emissions can occur, which can result in ozone-forming smog and health related problems. In California, gas cans use low permeation materials and automatic sealing nozzles to minimize or eliminate spillage and evaporative emissions. All gas cans sold in California must be certified by CARB as meeting the low-emission requirements.

CARB staff analyzed PFCs to identify potential contingency measure options. It would not be possible to begin implementation of any contingency measures for PFCs within 60 days. CARB does not regulate consumer use of PFCs and must achieve emission reductions through performance requirements, including emission standards, for new PFCs.

Manufacturers would need more than 1-2 years to design, certify, and manufacture PFCs that meet more stringent emission standards. Additionally, CARB regulations typically need to allow additional time for sell-through provisions to allow for consumers and retailers to transition to the new products, which further extends the implementation timeline. Adopting more stringent emission standards is not feasible to implement as a contingency measure because the regulatory process would take approximately 5 years from start to finish. The standards currently in place are also the most stringent standards across the nation.

In summary, there are no new technologically feasible control measures in the PFC regulations that could meet the triggering timelines and other requirements and are available to use as contingency measures.

Pesticides

Pesticides are used for urban and agricultural pest management across the State and are an area-wide source of ROG and other types of emissions. Pesticides are regulated under both

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federal and state law. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the U.S. EPA has authority to control pesticide distribution, sale, and use. The Department of Pesticide Regulation (DPR) has primary and broad authority to regulate the sale and use of pesticides in California. The pesticide element of the ozone SIP requires DPR to develop and implement regulations to reduce ROG emissions by specified amounts from agricultural and structural pesticide applications in nonattainment areas. CARB is supporting DPR to use its broad authorities to reduce ROG emissions as well as limit harmful exposures to pesticides impacting communities across the State.

DPR can generally reduce exposures to pesticides through the development and implementation of necessary restrictions on pesticide sales and use and by encouraging integrated pest management. Mitigation measures may be implemented by several methods, including regulations, local permit conditions, pesticide label changes, or product cancellation. Current regulations set limits on applications of certain pesticides and specify methods for application to protect public health. DPR regulations have been found by U.S. EPA to meet RACT, RACM, and BACM requirements as a part of past SIP submittals. Most recently, as a part of the 2022 State SIP Strategy developed to support attainment of the 70 ppb ozone standard across California, DPR committed to update their 1,3-Dichloropropene (1,3-D) regulations for health risk mitigation and volatile organic compound emissions reductions. The regulatory updates address both cancer and acute risk to non-occupational bystanders through requirements including those on applicators to use totally impermeable film tarpaulins or other mitigation measures that provide a comparable degree of protection from exposure. DPR submitted the rulemaking documents to the Office of Administrative Law on November 7, 2023, for final review and if approved will go into effect on January 1, 2024.

DPR has divided pesticide products into two groups for SIP purposes: fumigants and non-fumigants. The lead time needed to develop regulations for both groups of pesticide products may not fit in the contingency timeline required. For fumigant pesticide products, the primary measure to reduce ROG emissions is to change fumigation methods, such as deeper injection into the soil and covering fumigated areas with tarps that have low permeability. Developing new fumigation methods normally requires several years of research followed by rulemaking that usually requires two years or more to complete. For non-fumigant pesticide products, the primary measure to reduce ROG emissions is to change product formulations to reduce the ROG content. This also takes several years of research and rulemaking to complete. Additionally, changing product formulation normally requires review and registration of a new product by U.S. EPA and this takes a year or more to complete. For both fumigant and non-fumigant products, little work on contingency measures can be done beforehand due to changing pesticide use patterns. Pesticide products that contribute the most emissions currently may not be the ones that contribute

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the most in the future due to changing cropping patterns, introduction of new pesticide products, and other factors.

Further, DPR regulations are the most stringent pesticide controls in the country and represent all measures that are technologically feasible at this time. For example, U.S. EPA's Office of Pesticide Programs also works to reduce emissions to reduce toxic exposure and their measures are implemented through nationwide product label changes. U.S. EPA has nearly completed its most recent review of 1,3-D with minimal label changes, while DPR's 1,3-D regulations include fumigation method requirements that will further reduce emissions. CARB and DPR are not aware of any other states with regulatory requirements to reduce ROG emissions from pesticide products.

At this time, no additional measures for regulating pesticides have been identified for use as a contingency measure. However, DPR has developed a process to identify possible additional control measures through its roadmap for sustainable pest management (SPM). SPM is a process of continual improvement that integrates an array of practices and products aimed at creating healthy, resilient ecosystems, farms, communities, cities, landscapes, homes, and gardens. SPM examines the interconnectedness of pest pressures, ecosystem health, and human wellbeing. Going forward, CARB will continue to partner with DPR and explore the best methods to limit pesticide exposures, while also reducing emissions of volatile organic compounds.

Summary

At this time, CARB is including a zero-emission component in most of our regulations, both those already adopted and those that are in development, and the vast majority of these regulations are statewide in scope. Beyond the wide array of sources CARB has been regulating over the last few decades, and especially considering those we are driving to zero-emission, there are few area sources of emissions left for CARB to implement additional controls upon under its authorities for contingency purposes in the Coachella Valley.

Beyond the Smog Check Contingency Measure, no additional contingency measures were identified for mobile and non-mobile sources through CARB's analysis as shown in Table 1. Considering the air quality challenges California faces, if a measure achieving such reductions were feasible, CARB would implement the measure to support expeditious attainment of the NAAQS as the Clean Air Act requires rather than withhold it for contingency measure purposes. Further, should there be a measure achieving the required emission reductions, the measure would likely take more than 1-2 years to implement

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during which time the expected emission benefits could be reduced due to natural turnover of products and equipment.

Table 1: Assessment of Potential CARB Contingency Measures

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Pesticides	Fumigant products ROG reduction	Effective 4/1/16; Revise existing field fumigation methods.; Effective 1/1/24; Restrict use of 1,3-D for only agricultural commodities, set limits on application rate and methods to limit exposure/ emissions.	Require more stringent limitations and stricter application methods.	No; Trigger for use limit for 4 NAAs included in existing regulations; Standards requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days. Infeasible to achieve reductions within two years.	No; Research needed to achieve additional reductions.
	Non-fumigant products ROG reduction	Effective 11/1/13; Sale and use restrictions for products that have any of 4 primary active ingredients and applied to any of 7 crops in San Joaquin Valley.	Require use of "low-VOC" products.	No; Trigger requiring "low-VOC" products that have any of 4 primary active ingredients and applied to any of 7 crops in San Joaquin Valley included in existing regulations; Standards requirements need years of lead time to be implemented; infeasible to pull forward standards within 60 days. Infeasible to achieve reductions within two years.	No; Research needed to achieve additional reductions.

Draft CARB Contingency Measure Analysis

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Oil and Gas	Oil and Gas Methane Regulation	Adopted 3/23/17. Requires quarterly monitoring of methane emissions and some equipment will require vapor collection systems.	Reduce venting through equipment replacement or vapor control (control venting emissions). Expand/increase LDAR (control fugitive emissions).	No; Standards and requirements need years of lead time to be implemented; infeasible to pull forward standard within 60 days. Purchasing would not happen immediately or within one year of trigger; infeasible to achieve reductions within one 1-2 years.	No; only feasible controls are required to be implemented under U.S. EPA's Emissions Guidelines (finalized December 2023). No; current LDAR requirements are the most stringent in the country.
Consumer Products	Consumer Products	Amended 3/25/21. Lowered VOC standards for hair-care products, personal fragrance, manual aerosol air fresheners, and aerosol crawling bug insecticide.	Adopt and implement more stringent emission standards; pull forward compliance deadlines	No; Standards and requirements need years of lead time to be implemented; infeasible to pull forward standard within 60 days. Purchasing and manufacturing would not happen immediately or within one year of trigger; infeasible to achieve reductions within one 1-2 years.	No; cannot require manufacturers to develop new formulations and products only for contingency and to warehouse just for contingency purposes. Also, since California has the most stringent requirements, cannot bring in lower-emitting products already manufactured for other markets.
Consumer Products	Portable Fuel Container (PFC) Regulation	Amended 4/1/2017. Updated certification test fuel, established 4 year certification term, and streamlined test procedures with U.S. EPA.	Adopt and implement more stringent emission standards	No; Standards requirements need years of lead time to be implemented; infeasible to enforce more stringent standards within 60 days. Purchasing would not happen immediately or within one year of trigger; infeasible to achieve reductions within 1-2 years.	No; standards currently in place are the most stringent.

Draft CARB Contingency Measure Analysis

Emission Source	Regulatory Programs	Latest Amendment Requirements	Contingency Options	Trigger Feasibility	Technological Feasibility
Cargo Tanks (hauling gasoline)	Cargo Tank Vapor Recovery Program	Amended 10/01/23, Administrative in nature; corrected grammatical errors, removed imprecise language regarding alternative test procedures.	Setting more stringent standards	No; technology in this field has no new innovations and standards are more stringent than federal guidelines.	No; current standards and requirements are the most stringent in the nation and current technologies are most advanced.
Petroleum Marketing – Vehicle Refueling	Enhanced Vapor Recovery	Adopted July 26, 2012; performance standards for gasoline dispensing hose permeation April 2015; New performance standards and specifications for ECO Nozzles, including a more stringent nozzle spillage standard over EVR nozzles. December 2020; more stringent performance standard of 0.05 lbs/kgal for nozzle spillage for both EVR and ECO nozzles	Adopt and implement more stringent emission and performance standards	Standards requirements need years of lead time to be implemented; infeasible to enforce more stringent standards within 30 or 60 days. Purchasing would not happen immediately or within one year of trigger; infeasible to achieve reductions within one year.	California has the most comprehensive vapor recovery program applicable to GDFs in the country; no additional opportunities for increased stringency

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**APPENDIX C: TRANSPORTATION CONTROL MEASURES
INFEASIBILITY JUSTIFICATION**

Transportation Control Measures (TCMs)

Transportation Control Measures (TCMs) are strategies that reduce motor vehicle emissions by decreasing vehicle trips, vehicle usage, vehicle miles traveled (VMT), vehicle idling, and traffic congestion. TCMs are either one of the 16 types listed in CAA Section 108 (refer to the list below) or any other measures aimed at reducing emissions or concentrations of air pollutants from transportation sources by decreasing vehicle usage or altering traffic flow and congestion conditions. According to the U.S. EPA's Transportation Conformity Regulations, measures based on vehicle technology, fuel, or maintenance that control emissions from vehicles under fixed traffic conditions are not considered TCMs.

List of TCMs under CAA Section 108:

- (i) Programs for improved public transit;
- (ii) Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles;
- (iii) Employer-based transportation management plans, including incentives;
- (iv) Trip-reduction ordinances;
- (v) Traffic flow improvement projects that achieve emission reductions;
- (vi) Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service;
- (vii) Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during period of peak use;
- (viii) Programs for the provision of all forms of high-occupancy, shared-ride services;
- (ix) Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;
- (x) Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
- (xi) Programs to control extended idling of vehicles;
- (xii) Programs to reduce motor vehicle emissions, consistent with title II of the CAA, which are caused by extreme cold start conditions;
- (xiii) Employer-sponsored programs to permit flexible work schedules;

- (xiv) Programs and ordinances to facilities non-automotive travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of the transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity;
- (xv) Programs for new construction and major reconstructions of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest; and
- (xvi) Program to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks.

In terms of transportation planning and programming, the Basin falls under the jurisdiction of the Southern California Association of Governments (SCAG) and the four County Transportation Commissions (CTCs) in the Basin, namely Los Angeles County Metropolitan Transportation Authority, Riverside County Transportation Commission, Orange County Transportation Authority and the San Bernardino County Transportation Authority. Consequently, TCM projects are proposed, implemented, and updated by SCAG and CTCs as part of the ongoing transportation planning and programming processes. SCAG serves as the Metropolitan Planning Organization (MPO) for the Basin.

SCAG and the CTCs have established a comprehensive and formal process for identifying, evaluating, and selecting TCMs. CTCs, through an extensive project development and selection process, serve as the lead agencies responsible for recommending transportation projects, including TCM projects within the Basin, for funding under SCAG's long-range Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

Connect SoCal 2024 is the currently adopted RTP/SCS.¹ The RTP/SCS is updated every four years to incorporate changes in trends, assess progress made on projects, and adjust growth forecasts for population and employment changes. This long-range RTP/SCS integrates land use and transportation strategies aimed at achieving California Air Resources Board (CARB) greenhouse gas emissions reduction targets, providing a vision for transportation investments throughout the region. By utilizing growth forecasts and economic trends projecting over a period of more than 20 years, the RTP/SCS considers the role of transportation within the broader context of land use, the economy, the environment, and future quality-of-life goals. It identifies regional transportation strategies and a Sustainable Communities Strategy to address our mobility needs, air quality, and the challenges of climate change.

The RTP/SCS is developed through a collaborative process guided by SCAG's governing board, the Regional Council, its Policy Committees, Sub-committees, the Transportation Working Group, numerous technical advisory committees, working groups, and task forces, CTCs, subregions, local governments, state and federal agencies, environmental and business communities, tribal governments, non-profit groups, as well as the general public.

¹ <https://scag.ca.gov/connect-socal>

In addition, the TCM projects in the Basin are programmed and updated as part of SCAG's short-term Federal Transportation Improvement Program (FTIP) development process. The FTIP implements the RTP/SCS and is updated every two years.

SCAG develops the FTIP in partnership with the CTCs of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura, as well as the California Department of Transportation (Caltrans) Districts 7, 8, 11, and 12. The FTIP is a multimodal list of capital improvement projects to be implemented over a six-year period. It identifies specific funding sources and funding amounts for each project. The FTIP is prioritized to implement the region's overall strategy for providing mobility, improving the efficiency and safety of the transportation system, and supporting efforts to attain federal and state air quality standards by reducing transportation-related air pollution in the region. It must include all federally funded transportation projects in the region, as well as all regionally significant transportation projects requiring approval from federal funding agencies, regardless of funding source. The FTIP is developed incrementally to implement the programs and projects outlined in the RTP/SCS. The 2025 FTIP was adopted by SCAG in September 2024.²

The regular RTP and FTIP public update processes ensure that the identification and implementation of TCMs are routine considerations that assist SCAG in its efforts to support attainment of applicable National Ambient Air Quality Standards (NAAQS) in the Basin.

In the Basin, the following three categories of TCM projects and programs are identified and developed by the CTCs and included in SCAG's RTP/SCS and FTIP:

1. Transit and non-motorized modes;
2. High Occupancy Vehicle (HOV) Lanes and their pricing alternatives; and
3. Information-based Transportation Strategies (e.g., traffic signal synchronization).

In addition, Rule 2202 – On-Road Motor Vehicle Mitigation Options was adopted to reduce mobile source emissions generated from employee commute trips. Rule 2202 applies to larger employers in the region with more than 250 employees and requires these employers to implement one or more emission reduction options to reduce emissions from employee commute trips into their worksite. Rule 2202 is designed to reduce emissions of Volatile Organic Compounds (VOCs), Oxides of Nitrogen (NOx), and Carbon Monoxide (CO), by an equal or greater amount to that achievable through trip reduction. Rule 2202 provides employers with a menu of emission reduction options to implement and meet an Emission Reduction Target (ERT) for their worksite. The types of vehicles included in Rule 2202 emission calculations are passenger vehicles and light-duty vehicles (LT1 and LT2). Rule 2202 applies to approximately 1,250 worksites in the region consisting of about 670,000 peak window employees (starting work between 6:00-10:00am). Rule 2202 was amended in August 2023 to require additional data reporting, including reporting on telework policies and behaviors that may be different today than before the COVID-19 pandemic. This data will not be reported until 2025, and potential future amendments to Rule 2202 may be considered based on this data. Finally, Rule 2202 has

² <https://scag.ca.gov/2025-ftip>

not been approved into the SIP, and emission reductions associated with this rule are not SIP-creditable to the rule. Rule 2202 is therefore not a feasible measure for contingency.

As documented in Appendix IV-C of the South Coast AQMD's 2022 AQMP, which was adopted by the AQMD Governing Board in December 2022, it has been determined that the TCMs being implemented in the Basin encompass all TCM RACMs. None of the candidate measures reviewed, which have not been implemented, meet the criteria for RACM implementation. Appendix IV-C also includes a list of completed TCM projects and a list of TCM projects currently being implemented in the Basin.

TCMs are not suitable as contingency measures because they must be developed through the area's regional and county long-range transportation planning processes, which typically operate on a four-year cycle. Furthermore, TCMs are funded by various federal, state, and increasingly, local sources, each with their respective programming requirements. Therefore, considering the significant time required to advance these projects through the planning and funding processes, TCMs are not viable options as contingency measures.

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**APPENDIX D: EMISSION SOURCES AND APPLICABLE
RULES**

Table D-1

Applicable South Coast AQMD VOC Rules for EICs Contributing > 1% of 2037 Stationary Source Emissions in the South Coast Air Basin

EIC	Source Category	Subcategory	Material	VOC (tpd)	VOC (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
120-122-0242-0000	LANDFILLS	CLASS II AND III LANDFILLS	MUNICIPAL SOLID WASTE (MSW)	9.63	3.87	1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills	Waste Disposal
199- 170-0240-0116	OTHER (WASTE DISPOSAL)	COMPOSTING	SOLID WASTE (UNSPECIFIED)	6.40	2.57	1133.1 – Chipping and Grinding Activities, 1133.2 – Emission Reductions from Co-Composting Operations, 1133.3 – Emission Reductions from Greenwaste Composting Operations	Waste Disposal
220-204-0500-0000	DEGREASING	COLD CLEANING (BATCH - CONVEYOR - SPRAY GUN)	PETROLEUM NAPHTHA	5.72	2.30	442 – Usage of Solvents, 1122 – Solvent Degreasers, 1171 – Solvent Cleaning Operations	Cleaning and Surface Coatings, Degreasing
220-995-3000-0000	DEGREASING	OTHER	ORGANIC CHEMICALS (UNSPECIFIED)	2.52	1.01	443 – Usage of Solvents, 1122 – Solvent Degreasers, 1171 – Solvent Cleaning Operations	Cleaning and Surface Coating, Degreasing
230-218-9000-0000	COATINGS AND RELATED PROCESS SOLVENTS	AUTO REFINISHING	COATINGS (UNSPECIFIED)	9.38	3.77	442 – Usage of Solvents, 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations	Coatings and Related Processes, Motor Vehicle Non-Assembly Line Coating Operations
230-230-9000-0000	COATINGS AND RELATED PROCESS SOLVENTS	METAL PARTS AND PRODUCTS COATINGS	COATINGS (UNSPECIFIED)	6.07	2.44	442 – Usage of Solvents, 1107 – Coating of Metal Parts and Products, 1125 – Metal Container, Closure, and Coil Coating Operations	Cleaning and Surface Coatings, Metal Products Coating Operations

EIC	Source Category	Subcategory	Material	VOC (tpd)	VOC (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
250-292-8202-0000	ADHESIVES AND SEALANTS	ADHESIVES AND SEALANTS	ORGANIC SOLVENT BASED ADHESIVES AND SEALANTS (UNSPECIFIED)	3.48	1.40	442 – Usage of Solvents, 1168 – Adhesives and Sealant Applications	Adhesives and Sealants
330-319-0120-0000	PETROLEUM MARKETING	LPG TRANSFER AND DISPENSING LOSSES	LIQUIFIED PETROLEUM GAS (LPG)	3.70	1.49	1177 – Liquefied Petroleum Gas Transfer and Dispensing	Petroleum Production and Marketing, LPG Transfer and Dispensing Losses
330-395-1100-0000	PETROLEUM MARKETING	CARGO TANKS - PRESSURE RELATED FUGITIVE LOSSES	GASOLINE (UNSPECIFIED)	2.69	1.08	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510- 500-9060-0000	CONSUMER PRODUCTS	AEROSOL COATINGS	NONFLAT COATINGS (UNSPECIFIED)	3.10	1.24	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6793-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	HAND SANITIZER	9.05	3.64	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6750-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	PERSONAL FRAGRANCE PRODUCT (FRAGRANCE <= 20%)	8.34	3.35	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification

EIC	Source Category	Subcategory	Material	VOC (tpd)	VOC (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
510-506-6760-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	HAIR SPRAY	7.36	2.96	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6906-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	OTHER PERSONAL CARE PRODUCTS	7.02	2.82	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6780-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	RUBBING ALCOHOL	6.53	2.62	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6580-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	MULTI-PURPOSE SOLVENTS AND PAINT THINNERS	4.34	1.74	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6590-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	DISINFECTANTS	4.21	1.69	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6652-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	GENERAL PURPOSE CLEANERS - NON-AEROSOLS	4.01	1.61	Subject to CARB authority	Refer to Appendix B: CARB's Area Source

EIC	Source Category	Subcategory	Material	VOC (tpd)	VOC (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
							Infeasibility Justification
510-506-6790-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	LAUNDRY DETERGENT	3.93	1.58	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6741-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	HAND AND BODY LOTIONS	3.98	1.60	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6713-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	LIQUID/PUMP SPRAY AIR FRESHENERS	2.58	1.04	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6700-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	MULTI-PURPOSE LUBRICANT	2.50	1.01	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6742-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	SUN SCREEN/TANNING PRODUCTS	2.88	1.16	Subject to CARB authority	Refer to Appendix B: CARB's Area Source Infeasibility Justification
510-506-6732-0000	CONSUMER PRODUCTS	CONSUMER PRODUCTS	UNDERARM DEODORANTS	2.67	1.07	Subject to CARB authority	Refer to Appendix B: CARB's Area

EIC	Source Category	Subcategory	Material	VOC (tpd)	VOC (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
							Source Infeasibility Justification

Table D-2

Applicable South Coast AQMD NO_x Rules for EICs Contributing > 1% of 2037 Stationary Source Emissions in South Coast Air Basin

EIC	Source Category	Subcategory	Material	NO _x (tpd)	NO _x (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
010-005-0254-0000	ELECTRIC UTILITIES	BOILERS	NATURAL GAS	0.45	1.08	1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxide of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion- Boilers, Steam Generators, and Process Heaters
010-045-0110-0000	ELECTRIC UTILITIES	I.C. TURBINE ENGINES	NATURAL GAS	1.50	3.62	1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines, 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities	Fuel Combustion- Combustion Turbines
030-040-0100-0000	OIL AND GAS PRODUCTION (COMBUSTION)	I.C. RECIPROCATING ENGINES	GASEOUS FUEL (UNSPECIFIED)	0.65	1.58	1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines	Fuel Combustion- Reciprocating Internal Combustion Engines
040-005-0130-0000	PETROLEUM REFINING (COMBUSTION)	BOILERS	PROCESS GAS	0.73	1.76	1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations	Fuel Combustion- Boilers, Steam Generators, and Process Heaters
040-010-0130-0000	PETROLEUM REFINING (COMBUSTION)	PROCESS HEATERS	PROCESS GAS	2.35	5.69	1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations	Fuel Combustion- Boilers, Steam Generators, and Process Heaters
050-005-0110-0000	MANUFACTURING AND INDUSTRIAL	BOILERS	NATURAL GAS	0.52	1.27	1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxide of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion- Boilers, Steam Generators, and Process Heaters

EIC	Source Category	Subcategory	Material	NOx (tpd)	NOx (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
050-010-0110-0000	MANUFACTURING AND INDUSTRIAL	PROCESS HEATERS	NATURAL GAS	0.54	1.30	1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxide of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion- Boilers, Steam Generators, and Process Heaters
050-040-0110-0000	MANUFACTURING AND INDUSTRIAL	I.C. RECIPROCATING ENGINES	NATURAL GAS	2.58	6.24	1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines	Fuel Combustion- Reciprocating Internal Combustion Engines
050-995-0110-0000	MANUFACTURING AND INDUSTRIAL	OTHER	NATURAL GAS	2.15	5.20	474 – Fuel Burning Equipment - Oxides of Nitrogen, 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters	Fuel Combustion- Incinerators, Reciprocating Internal Combustion Engines, Boilers, Steam Generators, and Process Heaters
050-995-1500-0000	MANUFACTURING AND INDUSTRIAL	OTHER	RESIDUAL OIL (UNSPECIFIED)	0.73	1.76		
060-005-0110-0000	SERVICE AND COMMERCIAL	BOILERS	NATURAL GAS	0.80	1.93	1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxide of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion- Boilers, Steam Generators, and Process Heaters
060-030-0110-0000	SERVICE AND COMMERCIAL	WATER HEATING	NATURAL GAS	0.42	1.03	1121 – Control of Nitrogen Oxides from Residential Type, Natural-Gas-Fired Water Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion- Residential and Commercial Fuel Combustion

EIC	Source Category	Subcategory	Material	NOx (tpd)	NOx (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
060-040-0110-0000	SERVICE AND COMMERCIAL	I.C. RECIPROCATING ENGINES	NATURAL GAS	0.82	1.99	474 – Fuel Burning Equipment - Oxides of Nitrogen, 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines	Fuel Combustion- Reciprocating Internal Combustion Engines
060-040-1200-0000	SERVICE AND COMMERCIAL	I.C. RECIPROCATING ENGINES	DIESEL/DISTILLATE OIL (UNSPECIFIED)	1.48	3.59		
060-995-0120-0000	SERVICE AND COMMERCIAL	OTHER	LIQUIFIED PETROLEUM GAS (LPG)	0.57	1.37	474 – Fuel Burning Equipment - Oxides of Nitrogen, 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces, 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters	Fuel Combustion - Boilers, Steam Generators, and Process Heaters, Residential and Commercial Fuel Combustion, Incinerators
060-995-0110-0008	SERVICE AND COMMERCIAL	OTHER	NATURAL GAS	0.98	2.37		
060-995-0110-0007	SERVICE AND COMMERCIAL	OTHER	NATURAL GAS	3.54	8.56		
099-040-1200-0000	OTHER (FUEL COMBUSTION)	I.C. RECIPROCATING ENGINES	DIESEL/DISTILLATE OIL (UNSPECIFIED)	2.53	6.11	1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, 474 – Fuel Burning Equipment - Oxides of Nitrogen	Fuel Combustion - Reciprocating Internal Combustion Engines
120-132-0136-0000	LANDFILLS	FLARES	WASTE GAS	0.42	1.01	1118.1 – Control of Emissions from Non-Refinery Flares	Petroleum Production and Marketing – Vapor Recovery/Flares
130-130-0240-0000	INCINERATORS	INCINERATION	SOLID WASTE (UNSPECIFIED)	0.82	1.99	1165 – Control of Emissions from Municipal Solid Waste Incinerators	Waste Disposal
320-358-0010-0000	PETROLEUM REFINING	CATALYTIC CRACKING	HYDROCARBON COMPOUNDS (UNSPECIFIED)	0.45	1.08	1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations	Petroleum Production and Marketing - Other Refining-Related Operations

EIC	Source Category	Subcategory	Material	NOx (tpd)	NOx (%)	South Coast AQMD Applicable Rules	Location in Infeasibility Justification
610-606-0110-0000	RESIDENTIAL FUEL COMBUSTION	FUEL COMBUSTION - SPACE HEATING	NATURAL GAS	2.01	4.86	1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces	Fuel Combustion - Residential and Commercial Fuel Combustion
610-608-0110-0000	RESIDENTIAL FUEL COMBUSTION	FUEL COMBUSTION - WATER HEATING	NATURAL GAS	1.78	4.31	1121 – Control of Nitrogen Oxides from Residential Type, Natural-Gas-Fired Water Heaters, 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel Combustion - Residential and Commercial Fuel Combustion
610-610-0110-0000	RESIDENTIAL FUEL COMBUSTION	FUEL COMBUSTION - COOKING	NATURAL GAS	1.21	2.94	No applicable rule identified, but included in control measure R-CMB-03 in the 2022 AQMP	-
610-995-0110-0000	RESIDENTIAL FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	NATURAL GAS	2.68	6.47	No applicable rule identified, but included in control measure R-CMB-04 in the 2022 AQMP	-
610-995-0120-0000	RESIDENTIAL FUEL COMBUSTION	OTHER	LIQUIFIED PETROLEUM GAS (LPG)	1.61	3.90	No applicable rule identified, but included in control measure R-CMB-04 in the 2022 AQMP	-