SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Staff Report
Proposed Amended Rule 445 – Wood-Burning Devices

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TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

Rule 445 – Wood Burning Devices was adopted in March 2008 to implement the PM2.5[1] Control Measure BCM-03 of the 2007 Air Quality Management Plan (AQMP) to reduce PM2.5 emissions from wood-burning devices. Rule provisions apply to manufacturers, vendors, commercial firewood sellers, and persons owning or operating a wood-burning device. The majority of wood-burning devices in the South Coast Air Basin (SCAB)[2] are fireplaces and wood-stoves, but include any similar permanently installed, indoor or outdoor wood-burning devices. The rule also prohibits burning of products not intended for use as fuel, sale of unseasoned wood, and curtailment of wood-burning on "No-Burn" days when ambient PM2.5 concentration is forecast to exceed a threshold limit (currently at 29 $\mu g/m^3$)[3]. The rule was amended in May 2013 to implement Control Measure BCM-01 in the 2012 AQMP to address the U.S. EPA's lowering of the PM2.5 annual standard from 15 to 12 $\mu g/m^3$ to reflect a more health protective standard. The 2013 amendments expanded the wood-burning curtailment or No-Burn day restrictions by lowering the curtailment threshold from 35 to 30 $\mu g/m^3$, establishing criteria for Basin-wide curtailment, and also setting standards for commercially sold solid-fuel labeling. Exemptions are included for low income households, where the device is the sole source of heating, geographic elevations 3,000 feet or higher above mean sea level, and ceremonial fires. Rule 445 was amended in June 2020 to establish PM2.5 contingency measures that would be automatically implemented in the event that U.S. EPA determines that the SCAB had failed to meet a Reasonable Further Progress (RFP) milestone or to attain a PM2.5 National Primary Ambient Air Quality Standard by the attainment date, pursuant to CAA Section 172(c)(9).

The 2016 Air Quality Management Plan (AQMP) was developed to address the CAA requirements of the 2008 8-hour ozone standard. It was approved by the South Coast AQMD and the California Air Resources Board (CARB) and submitted to the U.S. EPA in April 2017. As an Extreme ozone nonattainment area, the SCAB relied on CAA section 182(e)(5) measures to comply with the attainment contingency requirement for the 2008 ozone standard to demonstrate compliance with RFP as well as contingency if the RFP milestones are not met. During the U.S EPA's evaluation of the 2016 AQMP, and as a result of a court's requirements for contingency measures in *Bahr v. EPA*, 836 F.3d 1218 (9th Cir. 2016), the U.S. EPA advised South Coast AQMD that the contingency measures identified in the 2016 AQMP were not sufficient, and that South Coast AQMD must adopt a local contingency measure to be triggered upon finding of failure to meet an RFP milestone for the 2008 8-hour ozone standard. On October 1, 2019, effective October 31, 2019, the U.S. EPA approved the ozone portion of the 2016 AQMP for the South Coast Air Basin, except for the RFP contingency measure requirement which was "conditionally approved"[4], relying on specific commitments to adopt new or modify existing rule or rules to provide for

1 Airborne fine particulate matter ≤ 2.5 micrometers in aerodynamic diameter (μm).

2 The South Coast Air Basin (SCAB or Basin) is a geographic region that encompasses Orange county and the non-desert portions of Los Angeles, Riverside and San Bernardino counties as defined in CCR, Title 17, Section 60104.

3 Micrograms per cubic meter. On 9/16/2020 US EPA published the finding of a failure to attain the 24-hour PM2.5 standard triggering the Rule 445(f)(2)(A) contingency provision lowering the PM2.5 forecast threshold from 30 μg/m3 to 29 μg/m3, effective November 1, 2020.

4 84 FR 52005

additional emissions reductions in the event that the South Coast Air Basin fails to meet an RFP milestone, and for CARB to submit the rule(s) to the U.S. EPA as a SIP revision within 12 months of the U.S. EPA's final action. Accordingly, the South Coast AQMD is under a deadline of October 31, 2020, to submit an RFP contingency measure to the U.S. EPA.

The proposed amendments, which would add ozone contingency measures to the rule, would be automatically implemented in the event that the U.S. EPA determines that the SCAB had failed to meet an RFP milestone or to attain an ozone NAAQS. These contingency control measures are necessary as part of comprehensive efforts to timely attain ozone standards.[5] When implemented the proposed contingency measures would automatically establish a Basin-wide No-Burn day threshold when the daily maximum 8-hour ozone air quality is forecast to exceed 80 ppb in any Source Receptor Area (SRA)[6]. The threshold would automatically be lowered consecutively to 75 ppb and 70 ppb for a second and third U.S. EPA finding of a failure to comply with a milestone/attainment requirement by the applicable due date, respectively. The proposed amendment would reduce ambient ozone by increasing the number of Basin-wide No Burn days. Staff has determined that during these additional months higher ozone days and ambient wood smoke concentrations are correlated.[7] Ozone emission reductions are anticipated from extending the current term of the wood-burning season (November, December, January and February) to include additional months (September, October, March and April), and adding a contingency provision for Volatile Organic Compound (VOC) emissions reductions from wood-burning curtailment in the rule. Both these provisions would become effective if proposed ozone contingency measures in the rule are triggered. Staff estimates that ozone contingency measures at 80, 75 and 70 ppb, if triggered, would result in an estimated 22.38, 46.10, and 88.43 TPY VOC emission reduction, respectively.

BACKGROUND

Ozone is a pollutant that is formed in the atmosphere by the reaction of oxides of nitrogen (NOx) and VOCs in the presence of sunlight. Numerous studies have linked inhalation of higher concentrations of ambient ozone with health effects such as increased mortality, respiratory and cardiovascular disease (see Health Effects section). The federal Clean Air Act (CAA) requires the U.S. EPA to set air quality standards for criteria pollutants and periodically review the latest health research to ensure that standards remain protective of public health. On July 18, 1997, the U.S. EPA revised the primary and secondary standards for ozone to a more health protective 0.08 ppm, averaged over an 8-hour period. In order to be further health protective, the 1997 8-hour ozone standard was lowered to 0.075 ppm in 2008, and to then 0.070 ppm in 2015.

Sections 172(c)(9) and 182(c)(9) of the CAA require contingency measures to be implemented if an ozone nonattainment area fails to meet reasonable further progress (RFP) milestones or fails to attain the NAAQS by the required attainment date. The U.S. EPA Ozone Implementation Rule

5 Discussion of 3% RFP demonstration.

6 See Attachment B

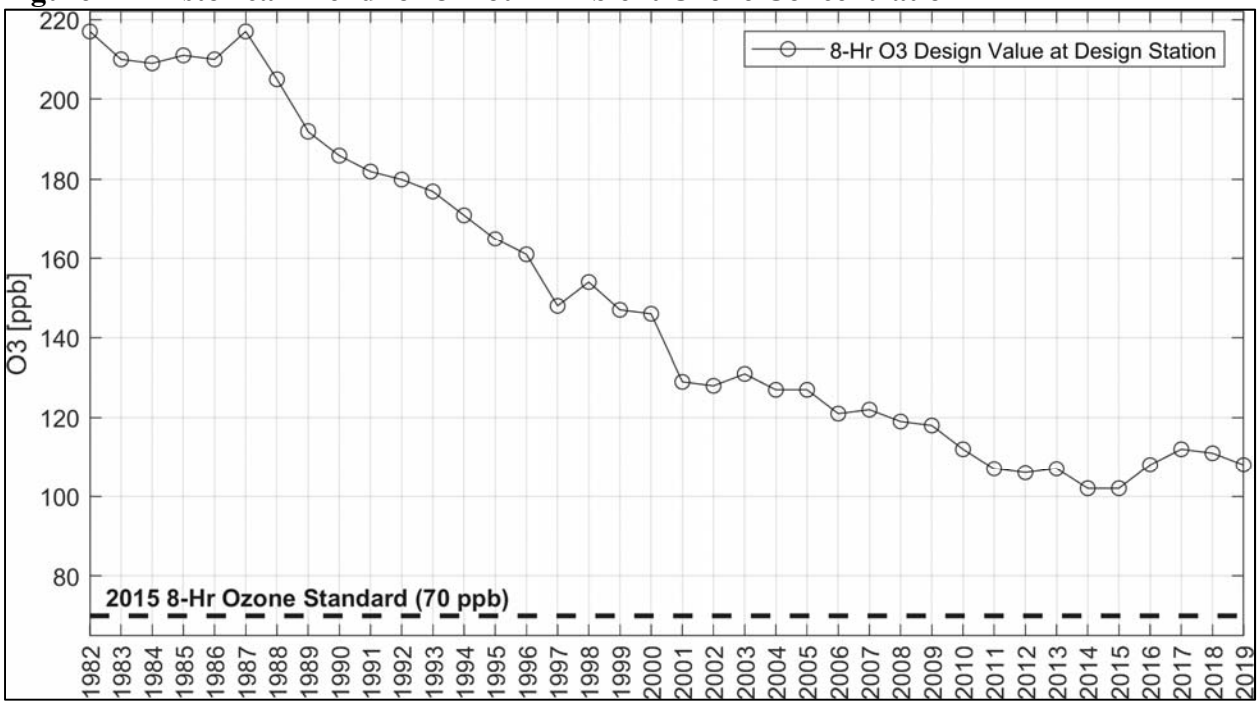
7 The US EPA AP-42 VOC emission factor for wood combustion is 229 pounds of VOC per ton of fireplace wood burned. Higher concentrations of levoglucosan, a product of wood-burning, have been measured in months with appreciable levels of ozone (see Background section).

also states that "contingency measures should represent one-year's worth of progress, amounting to reductions of three (3) percent of the baseline emissions inventory for the nonattainment area."[8] In addition, CAA Section 182(e)(5) allows Extreme nonattainment areas to rely on future development of new control techniques or improvement of existing control technologies as part of the control strategy for attainment of an ozone standard. A summary of the requirements and current designations for the 8-hour averaged federal ozone standards for the Basin is shown in Table 1. Figure 1 shows that while historically the Basin has trended downwards, it still remains in nonattainment for the status for the 8-hour ozone standards.

Table 1 – Historical Summary for Ozone Standards and Attainment Dates

8-Hour Standard	Attainment Threshold	Basin Status	Basin Designation	Attainment Date
1997	0.08 ppm (80 ppb)	Nonattainment	Extreme	6/15/2024
2008	0.075 ppm (75 ppb)	Nonattainment	Extreme	7/20/2032
2015	0.070 ppm (70 ppb)	Nonattainment	Extreme	8/3/2038

Figure 1 – Historical Trend for 8-Hour Ambient Ozone Concentration



8 80 FR 12264.

The 2016 Air Quality Management Plan (AQMP) was developed to address the CAA requirements of the 2008 8-hour ozone standard. It was approved by the South Coast AQMD and the California Air Resources Board (CARB) and submitted to the U.S. EPA in April 2017. In accordance with the U.S. EPA's guidance, for the 2016 AQMP contingency measures, the South Coast AQMD relied on baseline emissions in future years, representing reductions achieved from existing rules and regulations with future implementation, to demonstrate compliance with RFP as well as contingency if the RFP milestones are not met. As an Extreme ozone nonattainment area, the South Coast Air Basin relied on CAA section 182(e)(5) measures to comply with the attainment contingency requirement for the 2008 ozone standard.

Since the adoption of the 2016 AQMP, the U.S. EPA has expressed concern that the RFP contingency element of the 2016 AQMP might not satisfy the court's requirements for contingency measures in *Bahr v. EPA*, 836 F.3d 1218 (9th Cir. 2016). In that case, the court held that control measures that have already been implemented do not comply with the requirement for "contingency measures" under CAA section 172(c)(9). U.S. EPA staff has interpreted that decision to mean that contingency measures must include a future requirement to be triggered by a finding of failure to attain or failure to make RFP.

During the U.S EPA's evaluation of the 2016 AQMP, and as a result of the *Bahr* decision, the U.S. EPA advised South Coast AQMD that the contingency measures identified in the 2016 AQMP were not sufficient, and that South Coast AQMD must adopt a local contingency measure to be triggered upon finding of failure to meet an RFP milestone for the 2008 8-hour ozone standard. On January 9, 2019, South Coast AQMD submitted to the U. S. EPA a letter committing to adopt a new rule or amend an existing rule to satisfy the contingency measure requirement. On May 2, 2019, the Executive Officer sent an additional clarification letter, explaining what specific requirements would be changed in the rules if that rule is selected for contingency measure.

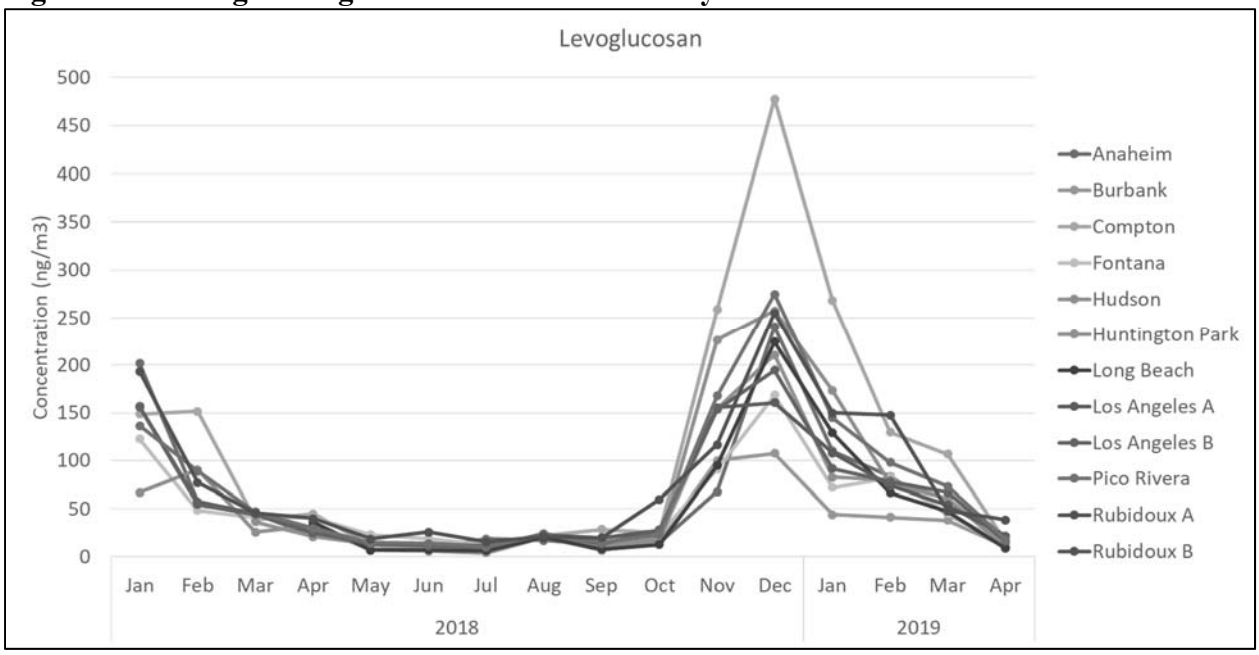
On October 1, 2019, effective October 31, 2019, the U.S. EPA approved the ozone portion of the 2016 AQMP for the South Coast Air Basin, except for the RFP contingency measure requirement which was "conditionally approved"[9]. The conditional approval relied on specific commitments from (1) South Coast AQMD to modify an existing rule or rules, or adopt a new rule(s), that would provide for additional emissions reductions in the event that the South Coast Air Basin fails to meet an RFP milestone, and (2) for CARB to submit the revised or new South Coast AQMD rule(s) to the U.S. EPA as a SIP revision within 12 months of the U.S. EPA's final action (effective October 31, 2019). Accordingly, the South Coast AQMD is under a deadline of October 31, 2020, to submit an RFP contingency measure to the U.S. EPA. The attainment contingency for the 2008 standard, currently relying on section 182(e)(5) measures, is required to be defined three years before the attainment year of 2032. Additional requirements are further discussed in the section titled Contingency Measures.

The proposed rule is designed to reduce ozone by extending the number of months during which wood-burning curtailment days may potentially be declared. As shown in Figure 2 below, higher

9 84 FR 52005

levels of levoglucosan (a product of wood-burning) are also measured[10] in the "shoulder" months of March, April, September and October on either side of the traditional current wood-burning season (November 1 through to the end of February). Figure 3 shows that there are also appreciable levels of ambient ozone during the shoulder months, so that a curtailment of wood-burning during the shoulder months is anticipated to reduce ambient ozone concentrations. This is also in line with U.S. EPA AP-42 emissions factor of 229 pounds of VOC emitted per ton of fireplace wood burned.[11]

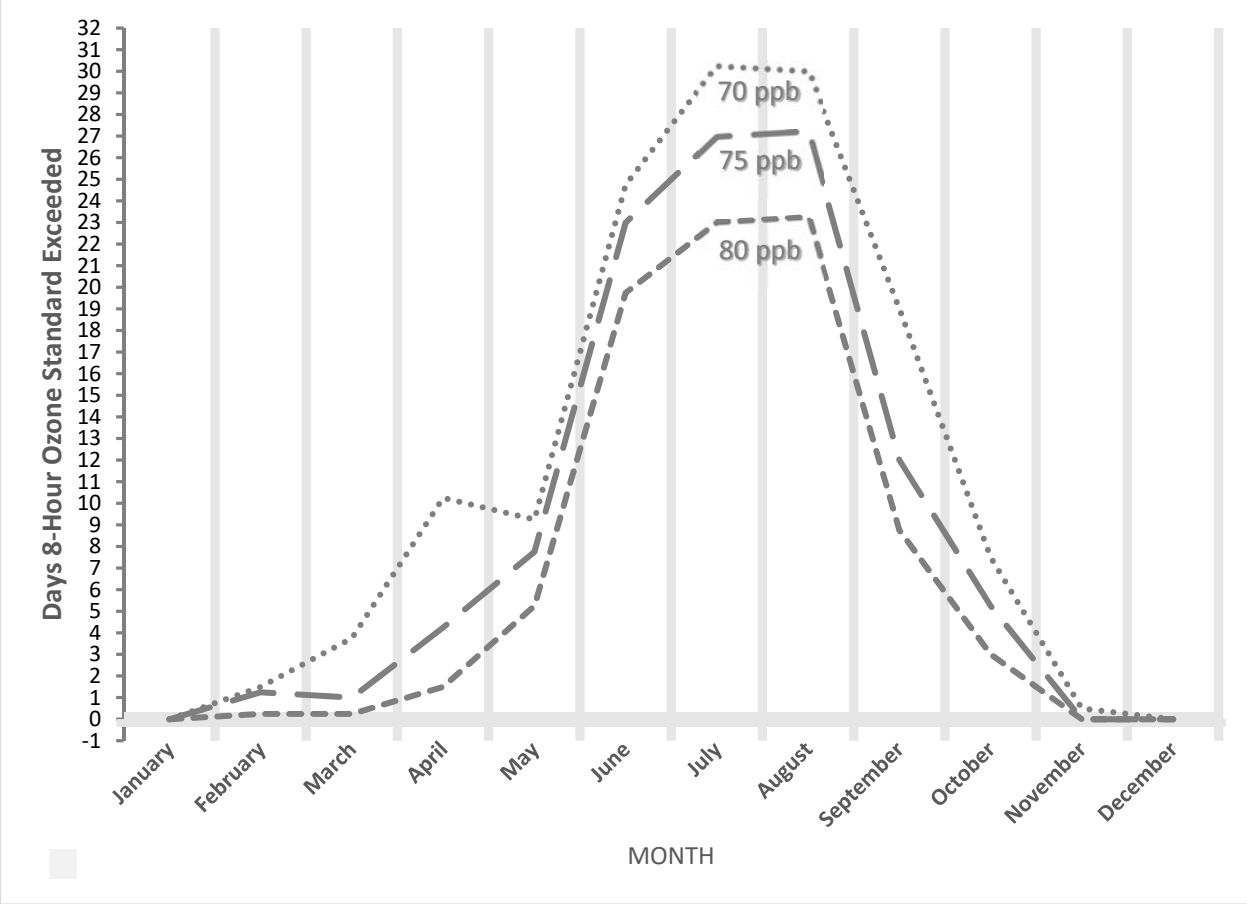
Figure 2 – Average Levoglucosan Concentrations by Month and Location



10 http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iii/mates-iii-draft-report-january-2008/appendix-vii-pm2-5-source-apportionment-methodology.pdf

11 https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s09.pdf

Figure 3 - Average Number of Days per Month Ozone Standard Exceeded (2016-2019)



HEALTH EFFECTS & ENVIROMENTAL IMPACTS

The adverse effects of ozone air pollution exposure on health have been studied for many years, as documented by a significant body of peer-reviewed scientific research, including studies conducted in Southern California. The April, 2020 U.S. EPA document, Integrated Science Assessment of Ozone and Related Photochemical Oxidants,[12] summarizes the state of the scientific knowledge and research on ozone and its health effects. A summary of health effects information and additional references can also be found in Appendix I: Health Effects in the 2016 AQMP. Individuals working outdoors, children (including teenagers), older adults, people with preexisting lung disease, such as asthma, and individuals with certain nutritional deficiencies are the sub-groups most susceptible to the effects of ozone. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences and daily hospital admission rates, as well as increased mortality. An increased risk for asthma has been found in children who participate in multiple sports and live in high-ozone communities. Ozone exposure under exercising conditions is known to increase the severity of respiratory symptoms. Although lung volume and airway resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

High levels of ozone also can affect sensitive plants by inhibiting photosynthesis, reducing the growth rate, and increasing the susceptibility to disease, insects, and severe weather. This can result in reduced crop output and the loss of species diversity in natural environments.

Residential wood-burning is a significant source of VOC emissions, a key ozone precursor. Many of these VOCs are considered air toxics, such as formaldehyde, acetaldehyde, acetonitrile, acrolein, benzene, and dioxin[13]. Emissions from residential wood-burning devices are caused primarily by incomplete combustion and also include PM, CO, NOx, and SOx. Additionally, incomplete combustion of wood produces polycyclic organic matter (POM), a group of compounds classified as hazardous air pollutants under Section 112 of the CAA. Biomass burning is also a source of black carbon (soot) which studies suggest can influence climate by directly absorbing light, reducing the reflectivity of snow and ice through deposition and interacting with clouds. According to CARB[14], soot from residential wood combustion is forecast to be the largest individual anthropogenic (man-made) source of black carbon in 2030 if no new programs are implemented.

OZONE FORECASTING

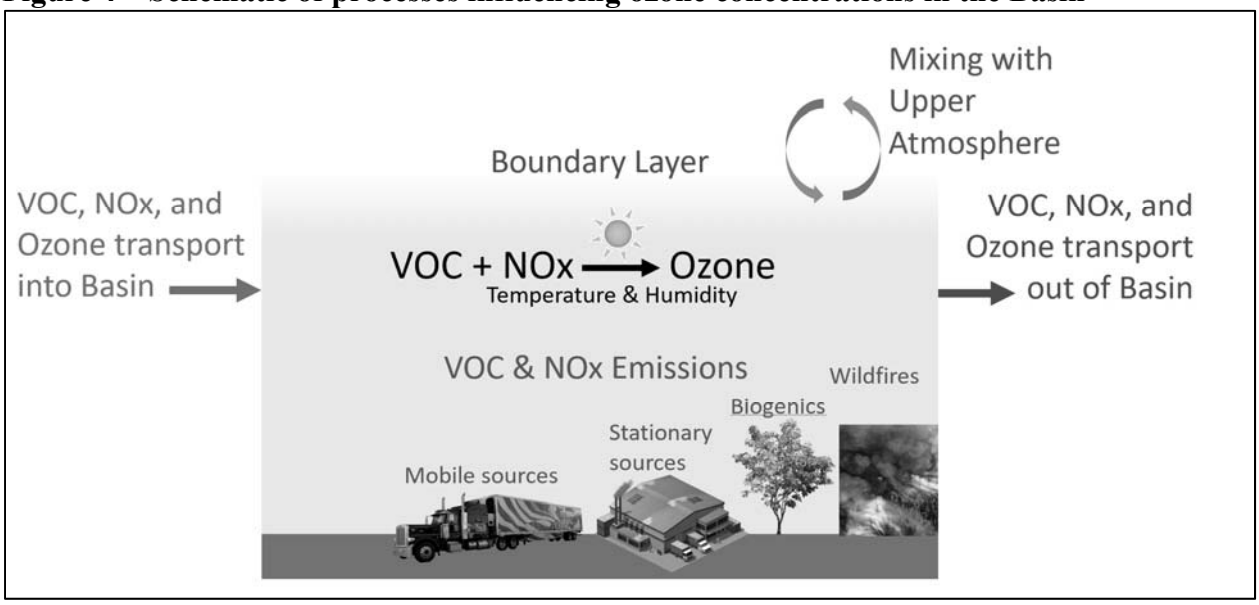
Figure 4 illustrates the processes influencing ozone concentrations in the Basin. NOx generated from combustion processes react with VOCs emitted from a wide variety of sources such as consumer products, mobile sources, vegetation, and combustion processes such as residential wood-burning to form ambient ozone. The chemical reactions that form ozone are highly complex and depend not only on NOx and VOC levels, but also on the ratio of VOC to NOx concentrations, temperature, the amount of sunlight, and other meteorological conditions. In addition, ozone can also be formed in one area and be transported to other areas.

12 U.S. EPA. (2020). Integrated Science Assessment of Ozone and Related Photochemical Oxidants (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-20/012, 2020. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=348522

13 Brown, S.G. et al, (2020). Assessment of Ambient Air Toxics and Wood Smoke Pollution among Communities in Sacramento County. Int. J. Environ. Res. Public Health, 17, 1080

14 CARB. Short-Lived Climate Pollutant Reduction Strategy. March 14, 2017. https://ww3.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf.

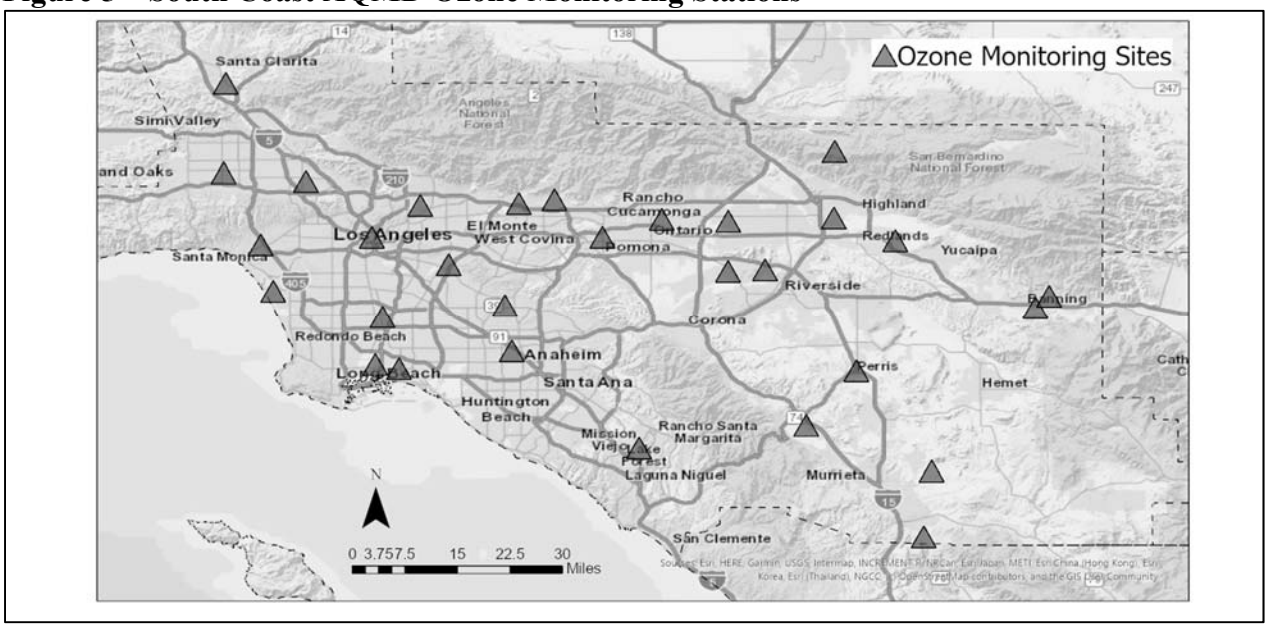
Figure 4 – Schematic of processes influencing ozone concentrations in the Basin



Ozone is measured at 27 stations operated by the South Coast AQMD throughout the Basin.[15] Compliance with the 8-hour ozone NAAQS is determined using a three (3) year average of the fourth highest (99th percentile) 8-hour daily maximum concentrations at each monitoring station, which is defined as the 8-hour ozone design value. The monitoring site with the highest measured values in an area is used for compliance purposes. Figure 5 illustrates the location of regulatory ozone monitors throughout the Basin, located in the same SRA's as currently defined in the rule (see Appendix B). Note that the proposed amendments do not change the existing definition of SRA's in the rule and the purpose of Figure 5 is to show the location of the ozone monitoring stations.

15 Details describing the monitoring network are presented in the annual South Coast AQMD Monitoring Network Plan available at http://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan

Figure 5 – South Coast AQMD Ozone Monitoring Stations

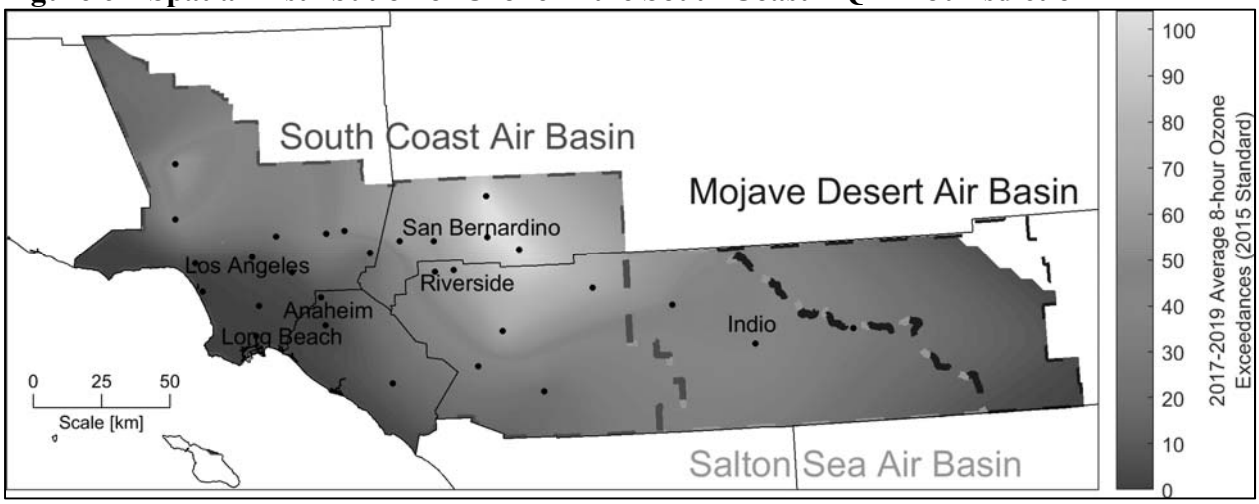


South Coast AQMD staff use weather forecasts, air pollution measurements, satellite data, and mathematical models to predict ozone, particulate (PM2.5 and PM10), nitrogen dioxide, and carbon monoxide concentrations. Forecast models are tools for making predictions, which are based on and evaluated by air pollution measurements. Traditionally, South Coast AQMD staff issued a daily air quality forecast summarizing conditions expected over the entire day for SRA's as shown in Figure 5 and Appendix B. With new models developed and maintained by NOAA[16] scientists, South Coast AQMD staff can also now issue hourly forecasts of PM2.5 and ozone for the next day. These models are customized using local measurements and state-of-the-science models of air pollution levels, resulting in more accurate predictions. The predicted pollutant levels are reported as an Air Quality Index (AQI). The higher the AQI, the higher the level of air pollution and potentially greater health concerns for the exposed population. Air quality forecasts are generated on the SRA level with models using monitoring data. However, not all SRAs contain an ozone monitoring station/equipment, in which case, the forecast is interpolated. Data is available in real-time and is used for air quality forecasting and public reporting of current conditions. AQI values, which are based on ozone, PM2.5, PM10, nitrogen dioxide, and carbon monoxide measurements, are reported in real-time on the South Coast AQMD and AirNow websites. Hourly forecasts provide more detailed information about pollution levels throughout the day. This can be useful, for example, in planning out what time of the day would be best for outdoor activities. For regulatory purposes however, a daily average forecast is used. The proposed rule amendments include a definition for the daily ozone air quality forecast as the predicted ambient maximum 8-hour average ozone concentration expected over the 24-hour period. This is to distinguish the daily ozone forecast which is used for forecasting No-Burn days from the hourly ozone forecast, which is provided for informational purposes only. Both hourly and daily Basin forecasts can be found on the South Coast AQMD website at: http://www.aqmd.gov/forecast.

16 The National Oceanic and Atmospheric Administration is a federal agency providing weather forecasts. https://www.noaa.gov/

Atmospheric chemistry and rates of dispersion are a strong function of topography and weather, leading to strong geographic variations in ozone concentrations. Ozone is formed in the atmosphere by reactions that take time to occur. The predominant afternoon onshore winds transport emissions towards the north into the San Fernando Valley and to the east towards the Inland Empire and the San Bernardino Mountains. These emissions react to form ozone as they are transported, generating higher concentrations as the plume moves north and east. Peak ozone concentrations in the Basin are generally highest in southwestern San Bernardino County. Figure 6 shows the distribution of ozone exceedance days in the Basin. Dilution of ozone and its precursors typically overcomes the competing effect of chemical formation as the plume moves beyond Crestline or the San Bernardino Valley.

Figure 6 – Spatial Distribution of Ozone in the South Coast AQMD Jurisdiction



RULE 445

Current provisions of Rule 445 control PM2.5 wood smoke emissions from wood-burning devices through several mechanisms. These include:

- New developments: prohibiting the installation of wood-burning devices in developments where construction began after March 9, 2009.

- Existing developments: by limiting the sale and installation of wood-burning devices to a:
  - U.S. EPA certified wood-burning heater,
  - pellet-fueled wood-burning heater,
  - masonry heater, or
  - dedicated gaseous-fueled fireplace insert.

- A prohibition against the burning of any product not intended for use as a fuel (e.g., trash, plastics, rubber products and treated wood).
- Sale of only seasoned wood fuel (20 percent or less moisture content by weight) by commercial wood-based fuel sellers between July 1, through to the end of February of the following year.

- A labeling requirement for commercial firewood sellers to affix an indelible label to each package of firewood advising at a minimum that there are times during the year (wood-burning season) when there may be a restriction on product usage (No-Burn days). The label or alternatively another form of written material which is provided must also list the No-Burn toll-free number and www.8774NOBURN.org website address. This advisory is intended to let the consumer know that on days declared to be No-Burn days, wood-burning is not allowed.

- PM2.5 Wood-Burning Season Mandatory Burning Curtailment (No-Burn): a prohibition on operating an indoor or outdoor wood-burning device, portable outdoor wood-burning device, or wood-fired cooking device during the wood-burning season (November 1 through February of the following year) based on the specified geographic area below 3,000 feet above mean sea level and applicable daily PM2.5 air quality forecast as follows:
  (A) Basin-wide if the daily PM2.5 air quality forecast exceeds 30 $\mu g/m^3$ for any source receptor area, or
  (B) subsequent to a determination by U.S. EPA, of a failure to comply with either a referenced PM2.5 standard or reporting requirement; the applicable daily PM2.5 air quality forecast as set forth in Contingency Measures.

- PM2.5 Contingency Measures: upon the issuance of a final determination by U.S. EPA, that the South Coast Air Basin has failed to comply with the following requirements the applicable date to:

  (A) meet any Reasonable Further Progress (RFP) requirement in an attainment plan approved in accordance with § 51.1012;

  (B) meet any quantitative milestone in an attainment plan approved in accordance with § 51.1013;

  (C) submit a quantitative milestone report required under § 51.1013(b); or,

  (D) attain the applicable PM2.5 NAAQS by the applicable attainment date,

  the contingency measure(s) shall be implemented, sequentially and in the order of stringency. The triggers for No-Burn threshold are as follows:

  (A) 29 $\mu g/m^3$ for first failure;

  (B) 28 $\mu g/m^3$ for second failure;

  (C) 27 $\mu g/m^3$ for third failure; and

  (D) 26 $\mu g/m^3$ for fourth failure.

Dedicated gaseous fueled fireplaces or electric powered devices are exempt from the provisions of Rule 445. Additional exemptions exist where there is no natural gas service within 150 feet of the property line, locations 3,000 feet or higher above mean sea level, when the device is the sole source of heat, when the device is in low income households, and for ceremonial fires, as defined in the Rule 444 – Open Burning.

CONTINGENCY MEASURES

In addition to the 2008 ozone standard, contingency measure requirements for other federal ozone standards are also applicable for the South Coast Air Basin. In 2015, the. U.S. EPA lowered the 8-hour standard to 0.070 ppm. The South Coast Air Basin is designated as Extreme nonattainment effective August 3, 2018. Contingency measures are required four years from the effective date of designation. Accordingly, the RFP and attainment contingencies for the 2015 8-hour ozone standard are due to U.S. EPA on August 3, 2022.

For the 1997 ozone standard, the RFP demonstration was included in the 2007 AQMP (Tables 6-2A and 6-2B).[17] For all milestone years, RFP was met based on reductions in baseline emissions. The baseline emissions incorporated the rules and regulations adopted/amended before the 2007 AQMP. Since the 2007 AQMP, many rules and regulations have been adopted/amended which provide additional emission reductions beyond those described in the 2007 AQMP baselines. Thus, the South Coast AQMD has already met its RFP milestone requirements for the 1997 standard. For the attainment contingency, South Coast relied in part on the commitment to submit by 2020 additional contingency measures meeting the requirements of CAA sections 172(c)(9) and 182(e)(5).[18] A Contingency Measure Plan was developed and submitted prior to January 1, 2020 to address the requirements in section 182(e)(5).[19] The proposed contingency measures included in PAR 445 would also address the attainment contingency requirement for the 1997 ozone standard.

Contingency measures should provide for emission reductions approximately equivalent to either one (1) year's worth of air quality improvement or 1 year's worth of reductions needed for RFP in the years following RFP milestone and attainment years. While the proposed amendments in Rule 445 satisfy a 'triggering mechanism' requirement set by the U.S. EPA based on the *Bahr* case, the reductions from the rule alone are not adequate to satisfy the 1-year's worth of progress, which is defined as a 3% emission reduction requirement of either NOx or VOC (or combined) per year. [20] However, additional surplus reductions available through existing regulations and programs in place will ensure that the 1-year's worth of progress is achieved.

The RFP and contingency measure requirements for the 2008 ozone standard were evaluated as part of the 2016 AQMP[21] and subsequently in the 2018 SIP update[22]. Both evaluations

17 2007 Air Quality Management Plan. Available at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2007-air-quality-management-plan/2007-aqmp-final-document.pdf?sfvrsn=2

18 76 FR 57871 and 77 FR12673

19 Contingency Measure Plan for the 1997 8-hour Ozone Standard for the South Coast Air Basin. Available at http://www.aqmd.gov/docs/default-source/planning/1997-ozone-contingency-measure-plan/1997-8-hour-ozone-draft-contingency-measure-plan---120619.pdf?sfvrsn=6

20 80 FR 12264

21 2016 Air Quality Management Plan. Available at http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

22 2018 California SIP Update. Available at https://ww2.arb.ca.gov/resources/documents/2018-updates-california-state-implementation-plan-2018-sip-update

demonstrated that baseline emissions in the South Coast Air Basin not only provided the required RFP progress, but surplus reductions amounting to at least one year's worth of progress (i.e. 3% emission reductions) needed for contingency measures (see Tables VI-C-1A and VI-C-1B of 2016 AQMP, and Tables IX-2 and X-4 of 2018 SIP Update). In other words, given the considerable amount of emission reductions generated from existing rules and regulations, there are surplus reductions for each of the milestone year after accounting for RFP and contingency requirements.

Based on the above analysis, the South Coast Air Basin satisfies the contingency requirements set in CAA section 172(c)(9) and the U.S. EPA's Ozone Implementation Rule. South Coast AQMD's PAR 445, Wood-Burning Devices, provides a contingency measure to be undertaken if the Basin fails to meet RFP or attain the applicable ozone standards by the applicable date. The emission reductions anticipated from PAR 445, in conjunction with reductions from existing rules and regulations, are expected to achieve the reductions equivalent to or more than 1-year's worth of progress. PAR 445 addresses the contingency measures for RFP and attainment for the applicable ozone standards (1997 8-hour ozone standard, 2008 8-hour ozone standard and 2015 8-hour ozone standard).

PROPOSED AMENDMENTS TO RULE 445

Proposed amendments to Rule 445 will not affect current PM2.5 related rule provisions or any existing exemptions. Staff is proposing the addition of ozone related contingency provisions with the following elements:

- The proposed amendments would add contingent ozone provisions to the rule which if triggered would also establish an extended Wood-Burning Season for ozone. If ozone contingencies are triggered, on days during the Wood-Burning Season based on ozone (September 1 through April 30) curtailment is mandatory when the daily maximum 8-hour ambient ozone concentration for the Basin is forecast to exceed thresholds in the rule based on NAAQS 8-hour ozone standards.

- Subsequent to rule adoption by the Governing Board, ozone contingency provisions in the rule that will automatically take effect upon a final determination by U.S. EPA of either, a failure to attain an ozone NAAQS, or comply with an RFP requirement, by the applicable due date.

- Curtailment thresholds corresponding to the 1997 (80 ppb), 2008 (75 ppb) and the 2015 (70 ppb) 8-hour ozone NAAQS.

- Contingency measures under the proposed rule achieve emissions reductions not otherwise relied upon in the current control strategy by incrementally lowering the curtailment forecast threshold for ozone with both incremental and cumulative emissions reductions quantified (see Appendix A). Figure 7 is a graphic showing the months during the wood burning season for which PM2.5, and (if the first ozone contingency measure in the proposed rule is triggered) ozone curtailment days may be declared. Note that there are no curtailment days in the months of May, June, July and August.

Figure 7 – Wood-Burning Season (Months) for Ozone and PM2.5

MONTH	*January*	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*
Current Wood Burning Season	◄►	◄►									◄►	◄►
Curtailment for PM2.5	◄►	◄►									◄►	◄►
Potential Wood Burning Season*	◄►	◄►	◄►	◄►					◄►	◄►	◄►	◄►
Potential Curtailment for Ozone*	◄►	◄►	◄►	◄►					◄►	◄►	◄►	◄►

* if the first ozone contingency measure in the proposed rule is triggered

Specific proposed amendments to the rule are as follows:

(a) Purpose	Clarifies that the purpose of the amendment is to add contingency measures in the rule for applicable 8-hour NAAQSs. Contingency measures would only become effective if triggered by failure to comply with any applicable RFP requirement, or applicable 8-hour ozone standard by the applicable attainment date. Rule Text: The purpose of this rule is to reduce the emission of particulate matter from wood-burning devices and establish contingency measures for applicable ozone standards.
(c)(3) Definitions - Daily Maximum 8-Hour Ozone Air Quality Forecast	Defines the standard to be used for declaring ozone No-Burn or curtailment days. Rule Text: DAILY MAXIMUM 8-HOUR OZONE AIR QUALITY FORECAST means the maximum predicted ambient average ozone concentration, during any rolling eight (8) hour time period for the entire consecutive 24-hour period, beginning at midnight of the current day and ending upon the subsequent midnight.
(c)(24) Definitions – Wood Burning Season	The Wood-Burning Season encompasses the term during which a curtailment day may potentially be called based on ambient conditions. Currently, the term spans the months of November through to the end of February. Staff proposes bifurcating the definition of wood-burning season in the rule to retain the current effective term for PM2.5 and define a new effective term for ozone. The span of existing wood-burning months (November, December, January and February) would be increased to include "shoulder" months on either side of the current term – expanding the season to September 1 through April 30. The wood-burning season for ozone would be

	implemented and only become effective upon the first final determination of a finding of a failure to comply with any applicable RFP requirement, or applicable 8-hour ozone standard by the applicable attainment date, triggering the first contingency measure for an ozone forecast threshold at 80 ppb. However, potential PM2.5 curtailment days may still only be declared November 1, through to the end of February exclusively, while ozone curtailment days may potentially be declared on any day during the wood-burning season. It is unlikely that any ozone curtailment days will be declared from November 1 through February however as ozone levels typically would not exceed thresholds during these months. Figure 7 shows the wood burning months of the year and the effective months for ozone and PM2.5 graphically. Rule Text: WOOD-BURNING SEASON means for: (A) PM2.5, the consecutive entire four (4) months of November, December, January, and February. (B) Ozone, upon triggering any one of the ozone contingency provisions in subparagraph (g), the consecutive entire eight (8) months of September, October, November, December, January, February, March and April.
(d)(5) – Requirements – Labeling and Sell through Provisions	For clarity, a past effective date is deleted, a typo corrected, and a reference updated. These amendments do not change or have any impact on the existing provisions in the rule. Rule Text: Labeling and Sell-Through Provision ~~Effective November 4, 2013, n~~No commercial firewood seller shall sell, offer for sale, or supply wood-based fuel without first attaching a permanently affixed indelible label to each package or providing written notice to each buyer at the time of purchase of bulk firewood that at a minimum that states the following: Use of this and other solid fuel products may be restricted at times by law. Please check (1-877-4NO-BURN) or (www.8774NOBURN.org) before burning. (A) Alternative language, toll-free telephone number or web address for the information specified in subdivision (~~g~~k) may be used, subject to Executive Officer approval.
(e) - Requirements - Wood-Burning Season PM2.5 Mandatory	Clarifies and confirms the existing triggering provisions regarding PM2.5. No change is being proposed to any existing PM2.5 provisions in the rule and

Burning Curtailment (No-Burn day)	these amendments do not change or have any impact on the existing provisions in the rule. Rule Text: Wood-Burning Season PM2.5 Mandatory Burning Curtailment (No-Burn day) No person shall operate an indoor or outdoor wood-burning device, portable outdoor wood-burning device, or wood-fired cooking device on a calendar day during the wood-burning season for PM2.5 so declared to the public by the Executive Officer to be a mandatory wood-burning curtailment (No-Burn) day based on the specified geographic area below 3,000 feet above mean sea level and applicable daily PM2.5 air quality forecast as follows: (1) Basin-wide if the daily PM2.5 air quality forecast for any source receptor area exceeds 30 $\mu g/m^3$, or (2) subsequent to a determination by U.S. EPA, pursuant to 40 CFR § 51.1014(a) of a failure to comply with either a referenced PM2.5 standard or reporting requirement; the applicable daily PM2.5 air quality forecast as set forth in subdivision (f) PM2.5 Contingency Measures.
(f) – Requirements - PM2.5 Contingency Measures	Clarifies and confirms the existing contingency measures regarding PM2.5. No change is being proposed to any existing PM2.5 provisions in the rule and this amendment does not change or have any impact on the existing provisions in the rule. Rule Text: PM2.5 Contingency Measures

(g) – Requirements - Wood-Burning Season Ozone Mandatory Burning Curtailment (No-Burn day)	Specifies the triggers for ozone contingency measures, triggered upon a final determination, by the U.S. EPA that the Basin has failed to comply with either an ozone RFP requirement or an applicable 8-hour NAAQS, by the applicable due date. Contingency measures, triggered for each final determination of a failure to comply or missed milestone, increase in stringency by decreasing the curtailment forecast threshold in a step wise fashion at 80, 75 and 70 ppb. These forecast thresholds reflect the requirements for the 1997, 2008 and 2015 8-hour ozone NAAQS, respectively. Once in effect, operation of wood-burning devices on No-Burn days based on the daily maximum 8-hour ozone forecast as defined in paragraph (c)(3), during the wood-burning season for ozone, from September 1 through April 30 as defined in paragraph (c)(24), is prohibited in all areas of the Basin located below 3,000 feet. Rule Text: (g) Ozone Contingency Measures (1) Upon the issuance of a final determination by U.S. EPA, that the South Coast Air Basin has failed to comply with the following requirements by the applicable date to: (A) meet a Reasonable Further Progress (RFP) requirement in an approved attainment plan for an applicable ozone NAAQS; or (B) attain an applicable ozone NAAQS by the applicable attainment date, the applicable contingency measure(s) specified in paragraph (g)(2) shall be implemented, sequentially and in the order of stringency. (2) Basin-wide, below 3,000 feet above mean sea level, no person shall operate an indoor or outdoor wood-burning device, portable outdoor wood-burning device, or wood-fired cooking device on a calendar day during the wood-burning season for ozone, so declared by Executive Officer to be a curtailment (No-Burn) day due to forecasted ambient ozone concentration levels, if the daily maximum 8-hour ozone air quality forecast for any SRA exceeds: (A) 80 ppb, upon a final determination of a first failure to comply with any of the provisions of paragraph (g)(1); (B) 75 ppb, upon a final determination of a second failure to comply with any of the provisions of paragraph (g)(1); and (C) 70 ppb, upon a final determination of a third failure to comply with any of the provisions of paragraph (g)(1).

(h) – Rule 444 Clarification	Clarifies that the proposed amendments will not impact the current implementation of Rule 444, including the necessity for prescribed burns essential for forestry management and prevention/mitigation of wildfires. Currently, Rule 444 restricts open burning on certain days during the wood-burning season for PM2.5 (November 1 through to the end of February). This provision confirms that the reference to Rule 444 provisions will remain unchanged and curtailment days for the purposes of Rule 444 do not include the expanded wood-burning months for ozone (September, October, March and April) when prescribed burns are critical for effective forestry management. Rule 444 also currently prohibits open burning at a forecast threshold of 150 AQI which corresponds to the proposed 85 ppb ambient ozone concentration threshold. Rule Text: i) Prohibitions on Permissive Burn Days as described in Rule 444(c)(25)(C) or restrictions on Marginal Burn Days as described in Rule 444 (c)(21)(D) shall be in effect only if a No-Burn day is declared during any of the consecutive months of November, December, January or February.
Other	Other clarifications include updating the numbering sequence in the rule and various references. For example, references in paragraph (i)(7) of the proposed rule are updated.

VOC EMISSION REDUCTION

Appendix A provides a detailed methodology for the estimated VOC emission reductions from the proposed rule. The methodology is based on an analysis of relevant historical daily ambient ozone concentrations in the Basin from January 2016 through December 2019. Table 2 summarizes the estimated total annual VOC emission reductions as detailed in Appendix A. Upon rule amendment, if contingency measures are triggered the resulting VOC emissions reduction will be 22.38 TPY, based on the anticipated number of annual Basin-wide curtailment days at a daily maximum 8-hour ozone air quality forecast threshold of 80 ppb. Similarly, upon triggering a second contingency measure (lowering the forecast threshold to 75 ppb) and triggering a third contingency measure (lowering the forecast threshold to 70 ppb), would result in estimated VOC emissions reductions of 46.10 and 88.43 TPY, respectively.

Table 2 - Estimated VOC Reductions (TPY) By Ozone Curtailment Thresholds

Contingencies	Upon Triggering the First Contingency Measure	Upon Triggering a Second Contingency Measure	Upon Triggering a Third Contingency Measure
Forecast Threshold	80 ppb	75 ppb	70 ppb
TPY	22.38	46.10	88.43

AFFECTED SOURCES

An estimated 1.4 million wood-burning devices are subject to the provisions of Rule 445.[23] The number of affected sources is not anticipated to change greatly since wood-burning devices have lengthy useful lifetimes and Rule 445 prohibits the installation of wood-burning devices in new developments. Rather it is anticipated that the proposed amendments will decrease the number of days that the devices can be operated resulting in emissions reductions. No additional costs are expected to be incurred. Provisions of the proposed amended rule would extend the prohibition on use of wood burning devices to additional days almost exclusively for ambience use of these devices. Wood burning devices that are the sole source of heat for a dwelling or structure are specifically exempted from the No-Burn mandate.

PUBLIC PROCESS

PAR 445 is being developed through a public process. A Public Consultation Meeting is scheduled for September 30, 2020, with close of comments on October 13, 2020 and the proposal is scheduled to be presented at the Stationary Source Committee on October 16, 2020. A Public Hearing regarding the proposed amendments to Rule 445 is scheduled for October 27, 2020. A public workshop with 75 days' notice, pursuant to Health & Safety Code § 40440.7, was not required because the proposed amendment does not significantly affect emissions limitations or air quality, as discussed in the paragraph on socioeconomic assessment requirements.

SOCIOECONOMIC ASSESSMENT

The proposed amendment is exempt from the requirement to prepare a socioeconomic assessment because as proposed, the amendments will not have a significant effect on emissions limitations or air quality. (Health & Safety Code § 40440.8). On adoption, the proposed amendments will not result in emissions reductions. Emission reductions from the proposed amendments would occur only if the specified triggering actions occur, thereby automatically adding curtailment based on ozone forecasting, expanding months for curtailment, and by sequentially lowering the ozone

23 James E. Houck and Brian N. Eagle, "Residential Wood Combustion Emission Inventory South Coast Air Basin and Coachella Valley Portion of Salton Sea Air Basin 2002 Base Year" Based on a 2002, www.omni-test.com, October 24, 2006, http://www.omni-test.com/publications/SCAQMD-RWC4.pdf.

curtailment threshold after multiple triggering actions. Staff does not anticipate any of the triggering actions to occur, and those emission reductions are therefore uncertain to occur. Even if one or two triggering events occurs, the amount of reductions would still be less than the CEQA significance threshold of 55 lb/day. Staff believes experiencing a third triggering event is very unlikely so there is no significant effect requiring a socioeconomic report. Consistent with Health & Safety Code § 40703, the direct costs expected to be incurred by regulated parties from PAR 445 are discussed below.

PAR 445 contingency measures, if triggered, would affect commercial firewood sellers in the Basin and the general public. Commercial firewood sellers belong to the industry of fuel dealers (NAICS 454319). Based on a South Coast AQMD staff survey, there are about 86 commercial firewood sellers in the Basin, out of which 31 are located in Los Angeles County, 24 in Orange County, 16 in Riverside County, and the remaining 15 in San Bernardino County. Additionally, PAR 445 would affect the general public who use wood-burning fireplaces and other wood-burning devices. The cost impacts of Basin-wide curtailment on firewood sellers are expected to be minimal because the additional number of No-Burn days for ozone due to this proposed amendment is expected to be small, at about 14 days, during the wood-burning season for ozone. The majority of commercial firewood sellers are expected to be small facilities. A lack of data on number of employees and gross annual sales of the affected commercial firewood sellers precludes staff from determining their small business status. Cost impacts to the general public are also expected to be minimal as wood-burning in the South Coast AQMD is done mainly for aesthetic purposes and there are cost-effective alternatives to burning wood for heating.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Sections 15002(k) and 15061, the proposed project is exempt from CEQA pursuant to CEQA Guidelines Sections 15061(b)(3) and 15308. Further, there is no substantial evidence indicating that any of the exceptions to the categorical exemption applies to the proposed project pursuant to CEQA Guidelines Section 15300.2. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062. If the project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties. In addition, the Notice of Exemption will be electronically filed with the State Clearinghouse to be posted on their CEQAnet Web Portal, which may be accessed via the following weblink: https://ceqanet.opr.ca.gov/search/recent.

CONCLUSION

PAR 445 amendments are necessary to promulgate new contingency measures to satisfy U.S. EPA concerns that existing contingency measures do not satisfy requirements under CAA section 172(c)(9) subsequent to the decision in *Bahr vs. EPA*. As such, the proposed amendments would add new contingency measures specific to ozone that would be triggered upon a finding of a failure to comply with either an ozone NAAQS or ozone RFP milestone, by the applicable due date. Furthermore, the South Coast AQMD is under a deadline of October 31, 2020, to submit an RFP contingency measure to the U.S. EPA, which includes such an element and so amending Rule 445 satisfies this requirement by demonstrating such contingency measures for ozone in the rule. The proposed amendments accomplish this mandate by adding an ozone curtailment

provision to the rule and then incrementally lowering the wood-burning curtailment threshold for ozone during an eight-month long wood-burning season for each determination of a failure to comply. These amendments would become effective, after adoption by the Governing Board, without any further action, and are anticipated to result in additional No-Burn days during the wood-burning season. Contingency measures, if triggered, are anticipated to successively establish the daily maximum 8-hour ozone air quality forecast threshold at 80, 75 and 70 ppb with VOC emissions reductions anticipated to average 22.38, 46.10 and 88.43 TPY, respectively. Existing PM2.5 rule provisions and existing open burn provisions are not impacted by the proposed amendments. Furthermore, the proposed amendments are anticipated to have negligible cost impacts and no significant environmental impacts.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirement to Make Findings:
California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the South Coast AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity
Proposed Amended Rule 445 is needed to promulgate additional contingency measures required under Clean Air Act Section 172(c)(9), 42 U.S.C. Section 7502(c)(9), to be put into effect and which can be automatically triggered upon an EPA finding of failure to meet reasonable further progress or attainment for an applicable ozone standard, as required by Bahr v. EPA, 836 Fd.3d 1218 (9th Cir. 2016).

Authority
The South Coast AQMD Governing Board has authority to adopt Proposed Amended Rule 445 pursuant to the California Health and Safety Code Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, and 41508.

Clarity
Proposed Amended Rule 445 is written or displayed so that its meaning can be easily understood by the persons directly affected by it. The addition of definitions will improve the clarity.

Consistency
Proposed Amended Rule 445 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.

Non-Duplication
Proposed Amended Rule 445 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

Reference
By adopting Proposed Amended Rule 445 the South Coast AQMD Governing Board will be implementing, interpreting or making specific the requirements in Clean Air Act Section 172(c)(9), 42 U.S.C. Section 7502(c)(9), as articulated by Bahr v. EPA, 836 F3d 1218 (9th Cir. 2016).

COMPARATIVE ANALYSIS

Under California Health and Safety Code Section 40727.2, the South Coast AQMD is required to perform a comparative written analysis when adopting, amending, or repealing a rule or regulation. The comparative analysis is relative to existing federal requirements, existing or proposed South Coast AQMD rules and air pollution control requirements and guidelines which are applicable to wood-burning devices. The proposed ozone-related amendments to Rule 445 do not conflict or overlap with existing federal requirements for wood burning devices. Existing provisions of Rule 445 for PM2.5 do not conflict with existing federal requirements for PM2.5 for wood burning devices in U.S. EPA's New Source Performance Standards, 40 CFR pt. 60, Sub. AAA. South Coast AQMD's only other regulation pertaining to burning, Rule 444 regulates open burning and does not conflict with Rule 445.

Appendix A – VOC Emission Reductions Expected from the Rule Amendment

VOC Emission Reductions Expected from the Rule 445 Amendment

1. Baseline Emissions

Annual average VOC emissions developed for the 2016 AQMP were utilized to estimate reductions expected from the proposed amended Rule 445. The two emission categories subject to the rule are Residential Wood combustion for Wood Stoves and Fireplaces. The annual average emissions of VOC from the two categories are 7.414 tons per day (TPD) in 2017. The rule baseline emissions do not change in future years due to full implementation of the current rule in year 2015 and the rule amendment adopted in June 5, 2020 is not implemented yet.

The rule baseline emissions were allocated to each Source Receptor Area (SRA) using a spatial allocation factor developed based on the U.S. Census American Community Survey (ACS) data regarding fuel type used to heat households. ACS is conducted every year to update a portion of the population. Excluding mountainous areas with altitude higher than 3000 ft, the basin-wide total emissions subject to the rule are 6.526 TPD in annual average emissions.

Residential wood burning has a distinctive seasonal signal with more activity during cold months and less in warm months. Wood burning emissions used to be allocated in January to April and October to December[1]. However, while recent levoglucosan measurements indicate that the bulk of wood-burning occurs during the months of November through February, some wood burning occurs throughout the year in the South Coast Air Basin. Levoglucosan is an organic compound indicating the presence of wood burning smoke. The measurements were taken at 10 locations within the South Coast Air Basin as a part of Multiple Air Toxics Exposure Study V (MATES V) conducted during the period of May 2018 to April 2019. Figure A-1 provides monthly fraction of levoglucosan concentrations using averages of the 10 sites data. The measurements indicate that December has the highest wood burning activities and July has the lowest. The CARB's method to allocate annual average emissions from wood combustion to each month is included for comparison in Figure A-1. While levoglucosan data is still preliminary, it clearly indicates the presence of wood burning smoke during summer months. Therefore, the monthly allocation factors based on the levoglucosan data are used to estimate emission reductions benefits from the proposed rule amendment.

[1] CARB Methodology Updates: Residential Wood Combustion, 2015. Available at https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-1_2011.pdf

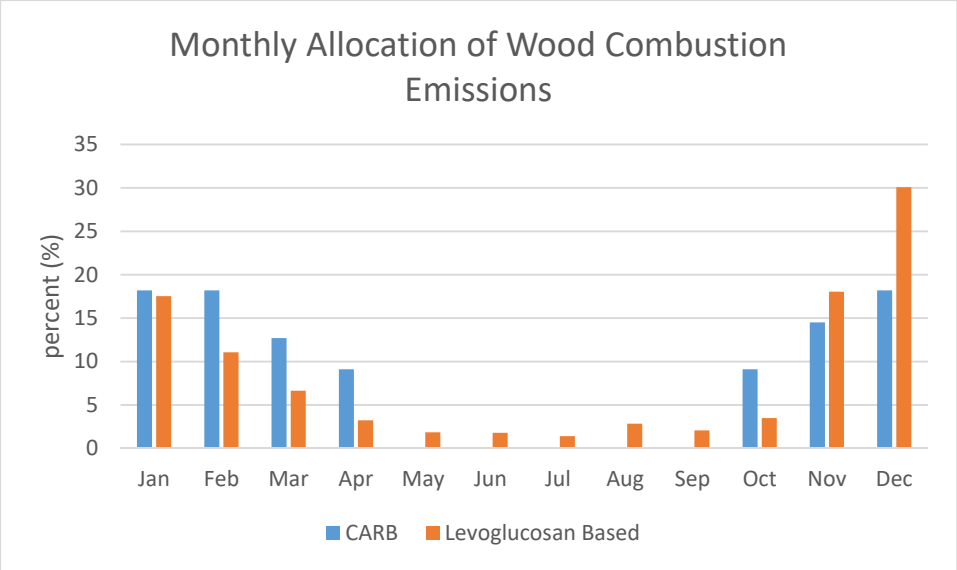


Figure A-1 - Monthly Allocation of Wood Combustion Emissions

Daily average VOC emissions for each month are provided in Table A-1. The daily average emissions for each month follows the trend in levoglucosan concentrations shown in Figure A-1, showing the highest wood combustion emissions in December and the lowest in July.

Table A-1 - Calculation of 2017 Daily Average VOC Emissions Per Month

Month	Number of days per month	Percent of Emissions Occurring in each Month (%)	VOC Emissions per Month (tons per year)	VOC Emissions per Day in each Month (tons per day)
1	31	17.53	417.5	13.468
2	28	11.06	263.4	9.406
3	31	6.64	158.2	5.103
4	30	3.23	77.0	2.566
5	31	1.84	43.8	1.412
6	30	1.79	42.6	1.420
7	31	1.41	33.6	1.083
8	31	2.84	67.6	2.180
9	30	2.06	49.2	1.639
10	31	3.48	82.9	2.674
11	30	18.05	430.0	14.334
12	31	30.07	716.3	23.106
Annual Total	365	100.00	2381.9	6.526

2. Emission Reductions from the Proposed Rule Amendment

The proposed amendment includes two mechanisms to expand the wood burning curtailment program. The first mechanism is to expand the curtailment season from the current four months (November to February) to eight months (September to April). The second mechanism is to define a threshold for daily maximum 8-hour ozone over which curtailment is triggered, during the curtailment season. Contingency measure thresholds for daily maximum 8-hour ozone are 80, 75 and 70 ppb, corresponding to the proposed curtailment thresholds in the rule.

In order to estimate emission reductions benefits from the amendment, the number of days exceeding a specific threshold were counted using 2016-2019 data (Table A-2). These numbers are the average of the four year data so they appear as a fraction of a day.

This analysis assumes that the wood-burning season for ozone, September 1 through April 30, is effective upon the first final determination of a finding of a failure to comply with any applicable RFP requirement, or applicable 8-hour ozone standard by the applicable attainment date, triggering the first contingency measure for an ozone forecast threshold at 80 ppb, as the proposed amendment defines the ozone wood burning season.

Table A-2 - The Number of 8-hour Ozone Exceedance Days Per Month

Month	Number of days exceeding 70 ppb	Number of days exceeding 75 ppb	Number of days exceeding 80 ppb
1	0.00	0.00	0.00
2	1.50	1.25	0.25
3	3.75	1.00	0.25
4	10.25	4.25	1.50
5	9.25	7.75	5.25
6	24.75	23.00	19.75
7	30.25	27.00	23.00
8	30.00	27.25	23.25
9	19.00	12.00	8.75
10	7.50	5.25	3.00
11	0.50	0.00	0.00
12	0.00	0.00	0.00

The number of exceedance days were multiplied by the daily average VOC emissions specified for each month, and multiplied by 0.75 to account for 75 percent compliance rate, to estimate emission reductions associated with each curtailment threshold (Table A-3). Table A-4 summarizes net VOC reductions with the expansion of curtailment season and ozone as curtailment trigger.

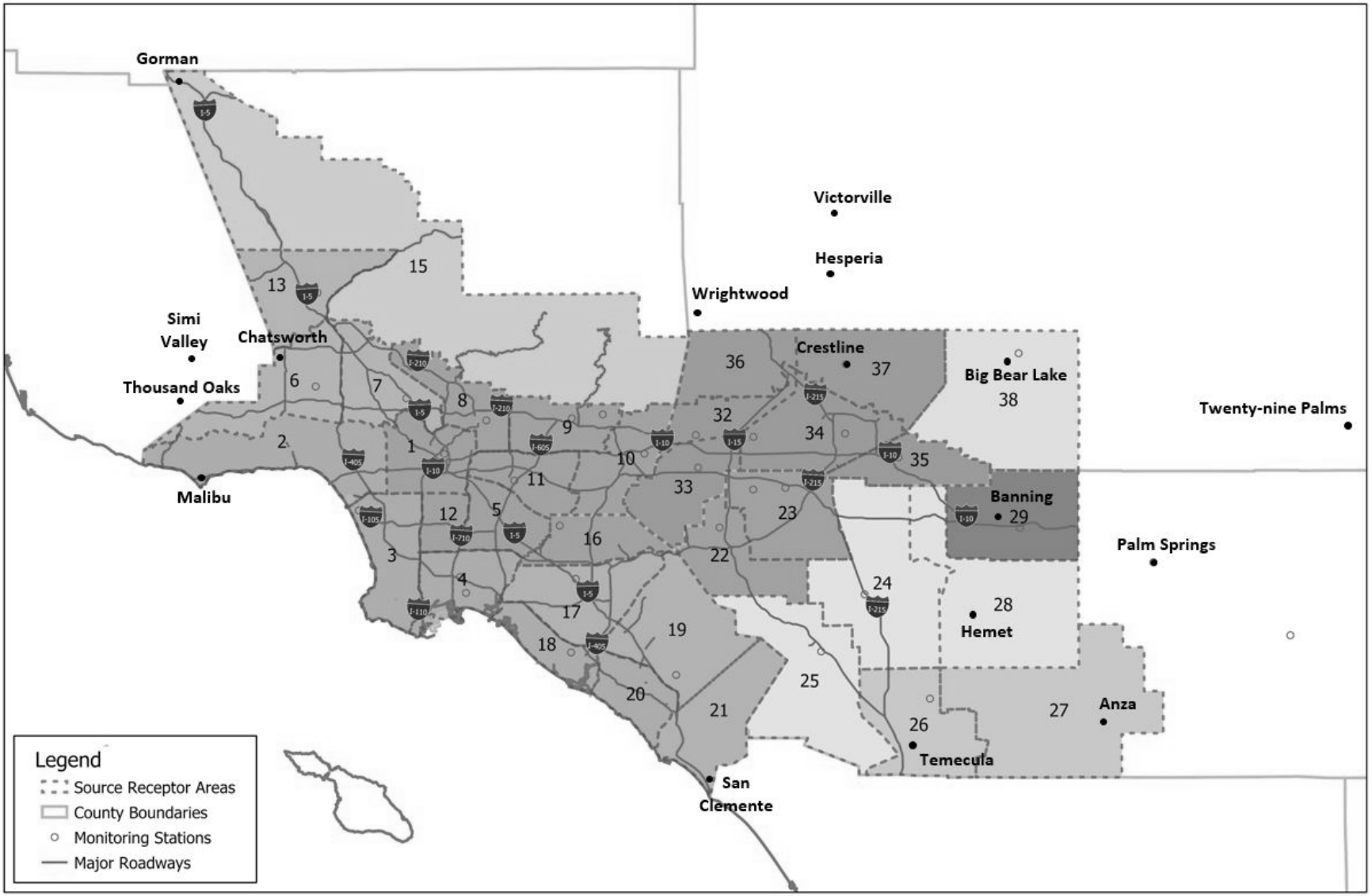
Table A-3 - VOC Emission Reductions Per Month (tons/month) for Each Curtailment Threshold

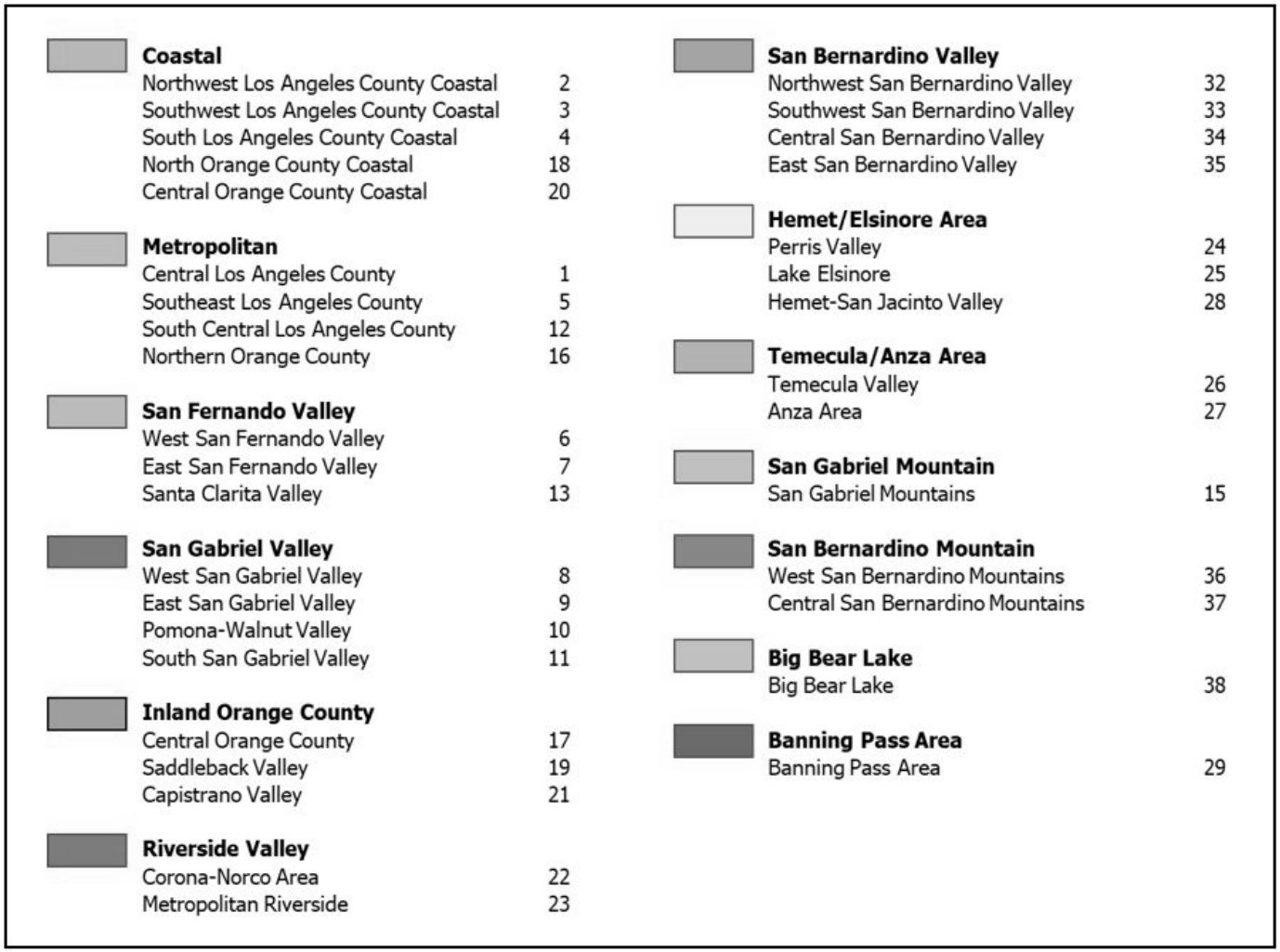
Month	70ppb	75ppb	80ppb
Jan	0.00	0.00	0.00
Feb	10.58	8.82	1.76
Mar	14.35	3.83	0.96
Apr	19.72	8.18	2.89
May	9.79	8.21	5.56
Jun	26.36	24.49	21.03
Jul	24.57	21.93	18.68
Aug	49.04	44.55	38.01
Sep	23.36	14.75	10.76
Oct	15.04	10.53	6.02
Nov	5.38	0.00	0.00
Dec	0.00	0.00	0.00

Table A-4 . Cumulative VOC emission reductions expected during curtailment season (September through April) from the rule amendment.

Curtailment Threshold	70ppb	75ppb	80ppb
VOC Reductions (tons per year)	88.43	46.10	22.38

APPENDIX B – Source Receptor Areas (SRAs)




Coastal
Northwest Los Angeles County Coastal 2
Southwest Los Angeles County Coastal 3
South Los Angeles County Coastal 4
North Orange County Coastal 18
Central Orange County Coastal 20
Metropolitan
Central Los Angeles County 1
Southeast Los Angeles County 5
South Central Los Angeles County 12
Northern Orange County 16
San Fernando Valley
West San Fernando Valley 6
East San Fernando Valley 7
Santa Clarita Valley 13
San Gabriel Valley
West San Gabriel Valley 8
East San Gabriel Valley 9
Pomona-Walnut Valley 10
South San Gabriel Valley 11
Inland Orange County
Central Orange County 17
Saddleback Valley 19
Capistrano Valley 21
Riverside Valley
Corona-Norco Area 22
Metropolitan Riverside 23
San Bernardino Valley
Northwest San Bernardino Valley 32
Southwest San Bernardino Valley 33
Central San Bernardino Valley 34
East San Bernardino Valley 35
Hemet/Elsinore Area
Perris Valley 24
Lake Elsinore 25
Hemet-San Jacinto Valley 28
Temecula/Anza Area
Temecula Valley 26
Anza Area 27
San Gabriel Mountain
San Gabriel Mountains 15
San Bernardino Mountain
West San Bernardino Mountains 36
Central San Bernardino Mountains 37
Big Bear Lake
Big Bear Lake 38
Banning Pass Area
Banning Pass Area 29