

# **SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

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## **Preliminary Draft Staff Report Proposed Amended Rule 1111 – NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces**

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## **EXECUTIVE SUMMARY**

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## EXECUTIVE SUMMARY

Rule 1111 reduces emissions of nitrogen oxides (NO<sub>x</sub>) from residential and commercial gas-fired fan-type space heating furnaces with a rated heat input capacity of less than 175,000 BTU per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 BTU per hour. The rule applies to manufacturers, distributors, sellers, and installers of such furnaces.

Rule 1111 was adopted by the SCAQMD Governing Board in December 1978 and amended in 1983, 2009, 2014, and March 2018. The more significant changes included: (1) the 2009 amendment lowering the NO<sub>x</sub> emissions from 40 to 14 nanograms per Joule (ng/J); (2) the 2014 amendment providing an alternate compliance option that allows the OEMs to pay a per unit mitigation fee of \$200 for each condensing furnace and \$150 for each other type of furnace, in lieu of meeting the new lower NO<sub>x</sub> emission limit, for up to 36 months past the applicable compliance date; and (3) the March 2018 amendment extending the mitigation fee alternate compliance option by 1.5 years for condensing furnaces and one year for non-condensing and weatherized furnaces, and increasing the mitigation fee to a range of \$300 to \$450, depending on the furnace type and heat input capacity, with no change to mobile home units.

As a companion to the rule amendment, staff has also proposed to establish a rebate program for consumers who purchase and install compliant furnaces in the SCAQMD to benefit consumers and incentivize the purchase of lower emitting compliant furnaces. The SCAQMD Governing Board authorized issuance of Request for Proposal (RFP) #P2018-05 on December 1, 2017, and the selection of Electric & Gas Industries Association (EGIA) on March 2, 2018, to implement the Rule 1111 rebate program.

At the March 2018 Public Hearing for the Rule 1111 amendment, the Governing Board approved the proposed amendments but also directed staff to return to the Board with a labeling requirement proposal for units that are subject to the mitigation fee alternate compliance option. The labeling would better inform consumers that non-compliant furnaces are subject to the mitigation fee, while compliant furnaces are commercially available and eligible for a consumer rebate.

Staff proposes to add labeling requirements for any furnace that is utilizing the mitigation fee alternate compliance option. The requirements will specify applicability, placement of the label, and label language.

## **CHAPTER 1: BACKGROUND**

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INTRODUCTION

REGULATORY HISTORY

EQUIPMENT AND PROCESS

REQUIREMENTS AND TESTS FOR NEW TECHNOLOGY

AFFECTED INDUSTRIES

PUBLIC PROCESS

## INTRODUCTION

The purpose of Rule 1111 – NO<sub>x</sub> Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces is to reduce NO<sub>x</sub> emissions from residential and commercial gas-fired fan-type space heating furnaces with a rated heat input capacity of less than 175,000 BTU per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 BTU per hour. The rule applies to manufacturers, distributors, sellers, and installers of such furnaces. It requires manufacturers to certify that each furnace model offered for sale in the SCAQMD complies with the emission limit using specific test methods approved by the SCAQMD and U.S. EPA. In lieu of meeting the lower emission limit, the current rule provides manufacturers an alternate compliance option of paying a per-unit mitigation fee for up to 3 to 4.5 years past the applicable compliance date depending on the furnace type. Most single family homes, many multi-unit residences, and some small commercial building in the SCAQMD use this type of space heating equipment.

## REGULATORY HISTORY

Rule 1111 was adopted by the SCAQMD Governing Board in December 1978, addressing all sizes of space heating furnaces. The original rule required all residential and commercial space heating furnaces to meet a NO<sub>x</sub> emission limit of 40 nanograms per Joule (ng/J) of heat output (equivalent to 61 ppm at a reference level of 3% oxygen and 80% Annual Fuel Utilization Efficiency (AFUE)) beginning January 1, 1984. At the December 1978 rule adoption Hearing, a rule requirement that all space heating furnaces meet a 12 ng/J NO<sub>x</sub> emission limit by 1995 was considered by the Governing Board but not adopted.

Rule 1111 was later amended in July 1983 in order to limit applicability based on a unit's size and to exempt larger commercial space heaters. The rule amendment limited applicability to furnaces with a heat input of less than 175,000 Btu per hour or, for combination heating and cooling units, a cooling rate of less than 65,000 Btu per hour. The July 1983 amendment also exempted units manufactured for use in mobile homes (manufactured housing), revised the definition of efficiency, and clarified testing procedures.

In November 2009, Rule 1111 was amended to be consistent with the objectives of the 2007 Air Quality Management Plan (AQMP) Control Measure CMB-03. The 2009 amendment established a new lower NO<sub>x</sub> emission limit of 14 ng/J (equivalent to 22 ppm at a reference level of 3% oxygen and 80% AFUE), and required the three major categories of residential furnace – condensing (high efficiency), non-condensing (standard), and weatherized – to meet the new limit by October 1, 2014, October 1, 2015, and October 1, 2016, respectively. Furthermore, new mobile home heating units, which were unregulated prior to the 2009 amendment, had to meet a NO<sub>x</sub> limit of 40 ng/J by October 1, 2012, with a future limit of 14 ng/J on October 1, 2018. The new lower NO<sub>x</sub> emission limit of 14 ng/J reflects a 65% reduction from the then current limit of 40 ng/J. To facilitate the depletion of existing inventories and to ensure a smooth transition to the new limits, Rule 1111 also provided a temporary 10-month exemption (a sell-through period) for units manufactured and delivered into the SCAQMD prior to the compliance date.

To encourage and accelerate technology development, the 2009 Rule 1111 amendment provided an incentive for early compliance with the 14 ng/Joule NO<sub>x</sub> emission limit, and a \$3 million fund was approved for this purpose. Manufacturers that delivered 14 ng/J furnaces into the SCAQMD prior to the applicable compliance date were given the opportunity to receive a payment of \$75 for each standard efficiency furnace and \$90 for each high-efficiency unit sold and delivered into the SCAQMD 90 days prior to the applicable compliance date. However, to date, no manufacturer has applied for this incentive.

The 2009 Rule 1111 amendment also required a technology assessment and status report to the Governing Board. This technology assessment evaluated both the feasibility of the new lower NO<sub>x</sub> emission limit and the rule implementation schedule. The SCAQMD Technology Advancement Office (TAO) initiated a Request for Proposals (RFP) to develop prototype residential furnaces that meet the new 14 ng/J NO<sub>x</sub> limit. The technology development projects were initiated in 2010 and completed in 2013. The total cost of the four projects was \$1,447,737 with \$447,737 provided by The Gas Company and \$50,000 provided by the San Joaquin Valley Unified Air Pollution Control District. The prototype furnaces developed through these four projects demonstrated that the new lower Rule 1111 NO<sub>x</sub> limit is achievable in all of the types of forced air residential heating furnaces produced for the United States market. However, additional time may be needed to commercialize 14 ng/J furnaces. This technology assessment was presented at the Governing Board meeting on January 10, 2014.

Rule 1111 was later amended in September 2014 to delay the compliance date for condensing furnaces and provide an alternate compliance option. The alternate compliance option allows manufacturers subject to Rule 1111 to pay a per unit mitigation fee of \$200 for each condensing furnace and \$150 for each other type of furnace distributed or sold into the SCAQMD, in lieu of meeting the new lower NO<sub>x</sub> emission limit. The mitigation fee alternate compliance option can be used for up to 36 months past the applicable compliance date. Depending on furnace type, the mitigation fee option will end, and the NO<sub>x</sub> limit of 14 ng/J will phase in, over the period from April 1, 2018, to October 1, 2021. Industry endorsed the mitigation fee approach. The 2014 amendment was State Implementation Plan (SIP)-approved in March 2016, and the mitigation fee will be used to offset foregone emissions reductions.

Rule 1111 was last amended in March 2018. Based on considerations of technology development and implementation status, stakeholders' input, and the need to encourage development and sale of compliant products, the following amendments were made to Rule 1111: (1) increasing the mitigation fee in two phases to a range of \$300 to \$450, depending on the furnace type and heat input capacity; (2) extending the mitigation fee alternate compliance option by 1.5 years for condensing furnaces, and one year for non-condensing and weatherized furnaces; (3) providing an exemption from the mitigation fee increase for units encumbered in a contractual agreement by OEMs and distributors for new construction, if contracts were signed prior to January 1, 2018; (4) providing an exemption of rule applicability for natural gas furnaces to be installed with propane conversion kits for propane firing only, with a defined labeling requirement; and (5) removing the 120 day lead time requirement for certification application submittal.

As a companion to the March 2018 rule amendment, staff also proposed to establish a rebate program for consumers who purchase and install compliant furnaces in the SCAQMD to benefit consumers and incentivize the purchase of lower emitting compliant furnaces. The SCAQMD Governing Board authorized the issuance of Request for Proposal (RFP) #P2018-05 on December 1, 2017, and selected Electric & Gas Industries Association (EGIA) on March 2, 2018, to implement the rebate program. Current funding for this rebate program include the previously authorized \$3 million and the incremental increase of Rule 1111 mitigation fees in the March 2018 amendment, dedicated to \$500 per furnace for the first 6000 rebates, and \$300 per condensing furnace and \$200 per each other type of furnace thereafter. The District will be closely monitoring the program with a “real-time” dashboard, and may seek additional funds or make other adjustments based on program performance. EGIA is anticipated to start receiving application in May 2018 for this Clean Air Furnace Rebate Program.

At the March 2018 Public Hearing for the Rule 1111 amendment, the Governing Board expressed concern that consumers should be informed that they are paying a fee for non-compliant furnaces sold in the marketplace and that there are compliant units commercially available that are eligible for money back through the rebate program. The Board directed staff to return to the Board with a labeling requirement in the rule to address these concerns.

## **EQUIPMENT AND PROCESS**

Fan-type gas-fired furnaces heat a building by circulating air from inside the building through the furnace. In a fan-type furnace, air is heated when it passes through a heat exchanger. Combustion gases heat up the inside of the heat exchanger and building air moving past the outside of the heat exchanger removes heat from the outside surface. A blower (fan) pulls air through one or more intake ducts and pushes the air past the heat exchanger and through another set of ducts, which direct the heated air to different parts of the building. The heated air circulates through the building before it is again pulled into the intake ducts and re-heated. This process continues until a specific temperature is detected by a thermostat in the building, which then shuts off the furnace. When the temperature at the thermostat goes below a set point, the thermostat sends a signal for the furnace to turn on.

## **REQUIREMENTS AND TESTS FOR NEW TECHNOLOGY**

Gas furnaces in the United States must meet the ANSI Z21.47/CSA 2.3 standard referred as CSA certification, mainly to ensure safety. To be sold and installed in the SCAQMD jurisdiction, they must also be certified by the SCAQMD for Rule 1111 NOx emission limit compliance by specific test methods approved by the SCAQMD and U.S. EPA. OEMs may also participate in AHRI certification program for verification test of output heating capacity and annual fuel utilization efficiency. As gas furnaces should be installed according to building Heating, ventilation, and air conditioning (HVAC) requirements, manufacturers have training programs for installers.

## **AFFECTED INDUSTRIES**

Proposed Amended Rule 1111 affects manufacturers (NAICS 333), distributors and wholesalers (NAICS 423), and retailers and dealers (NAICS 444) of residential furnaces. Because heating units regulated by the rule are used in most residential and many commercial settings for heating small buildings, construction and building contractors and installers (NAICS 238 and 811) related to residential furnaces are also affected by PAR 1111. The Air Conditioning Heating and Refrigeration Institute (AHRI), the major manufacturer's trade organization, indicates that there are no manufacturers of fan-type gas-fired residential furnaces in the SCAQMD. However, these companies do maintain regional sales offices and distribution centers in the SCAQMD and there are manufacturers of other types of heating furnaces in the SCAQMD.

## **PUBLIC PROCESS**

The proposed labeling requirements were discussed at the March 28, 2018, Working Group meeting. The proposal will also be discussed at the April 13, 2018, Public Consultation and the April 20, 2018, Stationary Source Committee (SSC) meetings. The Public Hearing for PAR 1111 is scheduled for June 1, 2018.

## **CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1111**

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### **PROPOSED AMENDMENTS TO RULE REQUIREMENTS**

## PROPOSED AMENDMENTS TO RULE REQUIREMENTS

In lieu of meeting the 14 ng/J NO<sub>x</sub> emission limit, paragraph (c)(5) provides furnace manufacturers that are subject to Rule 1111 an option to pay a per unit mitigation fee for up to 3 to 4.5 years past the Table 1 compliance date depending on the type of furnace. As a companion to Rule 1111, the SCAQMD Clean Air furnace rebate program provides consumers an incentive to purchase and install furnaces that are certified to meet the 14 ng/J NO<sub>x</sub> emission limit. The incentive is \$500/furnace for the first 6000 rebates, and thereafter \$300/condensing furnace and \$200/others. The labeling requirements are intended to inform the consumer market that non-compliant furnaces are subject to the mitigation fee, while compliant furnaces are commercially available and eligible for a consumer rebate.

### Labeling Requirements

Staff proposes to add new paragraph (e)(3) to require any furnace that is for distribution or sale inside of the SCAQMD that is not certified to meet 14 ng/J emission limit to have a label on the furnace and the shipping container no later than October 1, 2018.

Staff recommends to specify the label language to read: “For installation in SCAQMD only: This furnace is not meeting SCAQMD Rule 1111 14 ng/J NO<sub>x</sub> emission limit, and thus is subject to a mitigation fee of up to \$450 and not eligible for the Clean Air Furnace Rebate Program.

**Website link to the rebate program.”**

The mitigation fee is based on the timing (Phase One or Two) and the furnace type and size as shown in Table 2 of Rule 1111 and also shown in the following Table 2-1, as approved by the Governing Board in March 2018:

Table 2-1

Furnace		Phase One Mitigation Fee		Phase Two Mitigation Fee		Phase Two Mitigation Fee Option End Date
Size Range	Furnace Category	Phase One Mitigation Fee Start Date	Phase One Mitigation Fee (\$/Unit)	Phase Two Mitigation Fee Start Date	Phase Two Mitigation Fee (\$/Unit)	
≤ 60,000 BTU/hr	Condensing	May 1, 2018	\$275	October 1, 2018	\$350	September 30, 2019
	Non-condensing	October 1, 2018	\$225	April 1, 2019	\$300	September 30, 2019
	Weatherized	October 1, 2018	\$225	April 1, 2019	\$300	September 30, 2020
	Mobile Home	October 1, 2018	\$150	April 1, 2019	\$150	September 30, 2021
> 60,000 Btu/hr and ≤ 90,000 BTU/hr	Condensing	May 1, 2018	\$300	October 1, 2018	\$400	September 30, 2019
	Non-condensing	October 1, 2018	\$250	April 1, 2019	\$350	September 30, 2019
	Weatherized	October 1, 2018	\$250	April 1, 2019	\$350	September 30, 2020
	Mobile Home	October 1, 2018	\$150	April 1, 2019	\$150	September 30, 2021
> 90,000 BTU/hr	Condensing	May 1, 2018	\$325	October 1, 2018	\$450	September 30, 2019
	Non-condensing	October 1, 2018	\$275	April 1, 2019	\$400	September 30, 2019
	Weatherized	October 1, 2018	\$275	April 1, 2019	\$400	September 30, 2020
	Mobile Home	October 1, 2018	\$150	April 1, 2019	\$150	September 30, 2021

In lieu of the specified label language, the manufacturers may be provided an option to use a self-designed label or a label referencing other air district requirements that is approved no later than July 31, 2018 by the SCAQMD Executive Officer.

Staff is soliciting input on alternative approaches to the proposed labeling requirements. Such alternative would need to comply with the intent of the labeling requirements.

## **CHAPTER 3: IMPACT ASSESSMENT**

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**EMISSION REDUCTIONS AND COST EFFECTIVENESS**

**CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS**

**SOCIOECONOMIC IMPACT ASSESSMENT**

**DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY  
CODE SECTION 40727**

**INCREMENTAL COST-EFFECTIVENESS**

**COMPARATIVE ANALYSIS**

**CONCLUSION AND RECOMMENDATIONS**

## **EMISSION REDUCTIONS AND COST EFFECTIVENESS**

The proposed amendments do not result in any significant effect on air quality and do not result in any changes on emissions. As a result, a cost effectiveness analysis is not required.

## **CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS**

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, has reviewed the proposed amendments to Rule 1111 pursuant to: 1) CEQA Guidelines Section 15002(k) - General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 - Review for Exemption, procedures for determining if a project is exempt from CEQA. SCAQMD staff has determined that it can be seen with certainty that there is no possibility that the proposed amendments to Rule 1111 may have a significant adverse effect on the environment. Therefore, the project is considered to be exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. A Notice of Exemption will be prepared pursuant to CEQA Guidelines Section 15062 - Notice of Exemption. If the proposed project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

## **SOCIOECONOMIC IMPACT ASSESSMENT**

*A socioeconomic analysis will be conducted and released for public review and comment at least 30 days prior to the SCAQMD Governing Board Hearing on PAR 1111, which is anticipated to be heard on June 1, 2018.*

## **DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727**

California Health and Safety Code Section 40727 requires that prior to adopting, amending, or repealing a rule or regulation, the SCAQMD 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. In order to determine compliance with Sections 40727, 40727.2 require a written analysis comparing the proposed amended rule with existing regulations.

The following provides the draft findings.

**Necessity:** A need exists to amend Rule 1111 to provide labeling requirements for any furnace that is utilizing the mitigation fee alternate compliance option.

**Authority:** The SCAQMD obtains its authority to adopt, amend, or repeal rules and regulations from California Health and Safety Code Sections 39002, 40000, 40001, 40440, 40440.1, 40702, 40725 through 40728, 41508, and 41700.

**Clarity:** PAR 1111 has been written or displayed so that its meaning can be easily understood by the persons affected by the rule.

**Consistency:** PAR 1111 is in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or federal regulations.

**Non-Duplication:** PAR 1111 does not impose the same requirement as any existing state or federal regulation, and is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

**Reference:** In amending this rule, the SCAQMD hereby implements, interprets, or makes specific reference to the following statutes: Health and Safety Code sections 39002, 40001, 40702, 40440(a), and 40725 through 40728.5.

## **INCREMENTAL COST-EFFECTIVENESS**

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option that would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SO<sub>x</sub>, NO<sub>x</sub>, and their precursors. The proposed amendment does not include new BARCT requirements; therefore this provision does not apply to the proposed amendment.

## **COMPARATIVE ANALYSIS**

H&S Code §40727.2 (g) for comparative analysis is applicable when the proposed amended rules or regulations impose, or have the potential to impose, a new emissions limit or standard, or other air pollution control requirements. In this case, a comparative analysis is not required.

## **CONCLUSION AND RECOMMENDATIONS**

The proposed amendments are needed to inform consumers that non-compliant furnaces are subject to the mitigation fee, while compliant furnaces are commercially available and eligible for a consumer rebate, and thus steer the consumer choice towards the compliant furnaces for much needed NO<sub>x</sub> emission reduction.

## **REFERENCES**

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## REFERENCES

SCAQMD, 2009. *Staff Report: Proposed Amended Rule 1111 – NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces*. South Coast Air Quality Management District, November 2009.

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SCAQMD, March 2018. *Board letter: Execute Contract to Implement Consumer Rebate Program for Rule 1111 Compliant Natural Gas-Fired, Fan-Type Central Furnaces*