

SOCIOECONOMIC IMPACT ASSESSMENT

**PROPOSED NEW RULE 69.5.1 -
NATURAL GAS-FIRED WATER HEATERS**

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Prepared by

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EXECUTIVE SUMMARY

This report represents the results of a socioeconomic impact assessment (SIA) of the San Diego County Air Pollution Control District's (District) proposed new Rule 69.5.1 – Natural Gas-Fired Water Heaters. The proposed rule will help fulfill the District's commitment in the San Diego Regional Air Quality Strategy to implement all feasible control measures as required by state law.

Proposed new Rule 69.5.1 will regulate nitrogen oxide (NO_x) emissions from small water heaters. It applies to any person who manufactures, sells, offers for sale, distributes for use, or installs within San Diego County a new water heater with a heat input rating less than 75,000 Btu/hr. The rule requires NO_x emissions limit for new water heaters (referred to as ultra low-NO_x units) to be not higher than 10 nanograms per joule or 15 parts per million. For new water heaters used in mobile homes, the NO_x emission limit must not be higher than 40 nanograms per joule or 55 parts per million.

The proposed new rule requires manufacturers of water heaters to provide certification, labeling, and recordkeeping. The owners or operators of new water heaters do not need to obtain a Permit to Operate from the District.

There are approximately one million existing water heaters in San Diego County. Proposed new Rule 69.5.1 will apply when a unit reaches the end of its useful equipment life and is replaced, or when any new unit is installed. Upon full implementation, the rule is expected to reduce total NO_x emissions from all affected water heaters in San Diego County by approximately 75%, or 380 tons per year.

The annualized costs for ultra low-NO_x water heaters, on a per unit basis, are approximately \$24 higher than those for standard non-compliant units. The rule cost-effectiveness is between \$3 to \$6 per pound of NO_x reduced, depending on the heat input rating of the unit.

The proposed rule is not anticipated to have a significant economic impact on affected industries. The SIA demonstrates that the emission limits proposed in the rule are feasible considering the commercial availability and cost of compliant units.

I. INTRODUCTION

California law requires air pollution control districts (with populations of 500,000 people or higher) to perform a SIA when adopting, amending, or repealing rules and regulations that will significantly affect air quality and emission limitations.

The Health and Safety Code section 40728.5 specifies the following elements to be included in the SIA:

1. The necessity of adopting, amending, or repealing the rule or regulation in order to attain state and federal ambient air quality standards.
2. The type of business, including small business, affected by the rule or regulation.
3. The range of probable costs, including costs to industry or business, including small business, of the rule or regulation.
4. The emission reduction potential of the rule or regulation.
5. The impact of the rule or regulation on employment and the economy of the region affected by the adoption of the rule or regulation.
6. The availability and cost-effectiveness of alternatives to the rule or regulation.

This report presents the results of an of the District's proposed new Rule 69.5.1 (Natural Gas-Fired Water Heaters).

II. NECESSITY OF PROPOSED NEW RULE 69.5.1

San Diego County Air Basin does not attain the National and State Ambient Air Quality Standards for ozone. Both federal and state laws require the District to implement rules that control emissions of ozone precursors – volatile organic compounds and nitrogen oxides (NOx).

State law requires air districts in nonattainment areas to adopt every feasible measure to control ozone precursors in order to attain the Ambient Air Quality Standard for ozone at the earliest practicable date. Many air districts in California have already adopted rules regulating natural gas-fired water heaters with a more stringent NOx emission standard (10 nanograms/Joule (ng/J) for ultra low-NOx water heaters) than the standard in current District Rule 69.5. The San Diego Regional Air Quality Strategy identifies the 10 ng/J standard as a feasible measure to further control NOx emissions from water heaters contingent on the commercial availability of compliant equipment. Since compliant equipment is now readily available, the District is proposing the repeal of current Rule 69.5 and the adoption of proposed new Rule 69.5.1, which includes the 10 ng/J of NOx emission standard as a feasible measure.

III. SUMMARY OF PROPOSED NEW RULE 69.5.1

The new proposed rule will:

- Specify NO_x emission limits of 10 nanograms per joule or 15 parts per million (ppmv) for new residential-type water heaters, and 40 nanograms per joule or 55 ppmv for new mobile home water heaters.
- Prohibit the manufacture, sale, offer for sale, distribution, or installation, for use within San Diego County, of any new unit with a rated heat input capacity of less than 75,000 Btu/hr that does not comply with the emission standards of the rule.
- Require a manufacturer of any new unit to be offered for sale within San Diego County, to submit to the District a statement certifying that each model of water heater complies with the provisions of the rule.
- Require a manufacturer to display on the shipping carton and the nameplate of every new unit to be offered for sale within San Diego County, the model number of the unit in compliance with proposed new Rule 69.5.1 or, alternatively, the most current requirements of the South Coast Air Quality Management District (SCAQMD) Rule 1121 (Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters).
- Require a manufacturer to keep emissions test records and certification records for as long as the unit model is offered for sale or sold within San Diego County, or for three calendar years after manufacture, whichever is longer.
- Provide a twelve-month period after the date of adoption before the new rule takes effect.

IV. TYPE OF INDUSTRIES AFFECTED BY PROPOSED NEW RULE 69.5.1

Proposed new Rule 69.5.1 will affect manufacturers (NAICS 335228), distributors and wholesalers (NAICS 423720), and installers (NAICS 238220) of water heaters. These units are used throughout the residential and commercial sectors in San Diego County that need a supply of hot water.

V. ESTIMATED NO_x EMISSIONS IN SAN DIEGO COUNTY AFFECTED BY THE PROPOSED NEW RULE

Existing natural gas-fired water heaters rated less than 75,000 Btu/hr are currently exempt from District requirements for a permit to operate. Thus, the District does not have a comprehensive inventory of existing units operating in San Diego County within the applicable size rating. However, based on natural gas fuel usage,¹ and natural gas consumption by end use², the total NO_x emissions from existing units are estimated to be about 500 tons per year.

VI. EMISSION REDUCTION POTENTIAL AND COST-EFFECTIVENESS OF THE PROPOSED NEW RULE

Ultra low-NOx units that comply with the proposed emission standards of the rule are currently available on the market. This availability is due to similar rules that have already been adopted by other California air districts. Full implementation of proposed new Rule 69.5.1 is expected to reduce annual NOx emissions by approximately 380 tons per year, or by 75% of the original controlled emission level, with the cost-effectiveness ranging between \$3 and \$6 per pound of NOx emissions reduced.

VII. RANGE OF PROBABLE COSTS TO INDUSTRY INCLUDING SMALL BUSINESS

A variety of ultra low-NOx units are now commercially available as a result of rules adopted by the South Coast, Ventura County, San Joaquin Valley, and other California air districts. Therefore, compliance with proposed new Rule 69.5.1 is not expected to increase costs for manufacturers for developing new technology.

There will be no immediate impact on existing residences and businesses that presently have water heaters on the premises. The rule requirements, which are effective 12 months after the date of adoption, will apply only when an existing unit is replaced or a new unit is installed.

The current average cost of an ultra low-NOx unit is in general somewhat higher than the cost of a conventional unit. Table 1 below shows the annualized cost of ultra low-NOx and conventional units of different sizes for persons who will need to replace an old unit or install a new one. The costs of equipment are based on information obtained from various manufacturers and include installation expenses. The annualized costs were calculated assuming 12 years of useful equipment life, and 6% interest.

The table shows that the difference in annualized costs is estimated at \$24 per year. It should be noted that newer ultra low-NOx units have a higher efficiency than conventional units, resulting in fuel cost savings and help offset the increase in cost of ultra low-NOx units. Furthermore, the cost differential is anticipated to reduce as demand for ultra low-NOx units increases over time and per-unit manufacturing costs fall, while demand for non-compliant conventional units decreases and per-unit manufacturing costs rise. Therefore, proposed new Rule 69.5.1 will not have a negative economic impact on industry including small business in San Diego County.

TABLE 1 – Total Installed and Annualized Costs of Combustion Units Subject to Proposed Rule 69.5.1

<i>Size Range of Units Heat Input Rating (Btu/hr)</i>	<i>Ultra Low-NOx Unit Average Installed Cost (\$)</i>	<i>Non-compliant Unit Average Installed Cost (\$)</i>	<i>Ultra Low-NOx Unit Average Annualized Cost (\$ /yr)</i>	<i>Non-compliant Unit Average Annualized Cost (\$/yr)</i>
32,000	900	700	112	88
36,000	1,000	800	121	97
40,000	1,200	1,000	145	121
65,000	1,400	1,200	160	137
75,000	1,700	1,500	202	178

VIII. IMPACT OF THE PROPOSED NEW RULE ON EMPLOYMENT AND THE REGIONAL ECONOMY

The District is required by state law to incorporate every feasible measure to control ozone precursors and to attain the Ambient Air Quality Standard for ozone at the earliest practicable date. The California Air Resources Board interprets “every feasible measure” to mean that, at a minimum, an air district should follow similar regulations that have been successfully implemented elsewhere. Various air districts in California have already demonstrated feasibility through the adoption of rules that are similar to proposed new Rule 69.5.1. For example, the SCAQMD Rule 1121 emission standards have applied to the type of equipment that would be subject to proposed new Rule 69.5.1 since early 2008.

The proposed rule will require retail establishments and contractors to distribute, sell or install units with ultra low-NOx burners. It is a point-of-sale rule in which new, ultra low-NOx units will replace existing higher emission units gradually over time. The rule will provide a twelve month sell-through period for conventional non-compliant units currently in business inventories to be sold or installed before new compliant ultra low-NOx units are required. Therefore, the rule will not have a negative impact on manufacturers or distributors of this equipment.

As noted previously, while ultra low-NOx units are typically more expensive than standard non-compliant units, it is anticipated that equipment costs will decrease over time due to advances in technology and increase in demand for lower emission units, and thus, combined with fuel cost savings relative to conventional units, the economic impact on the equipment users will be minimal.

In its socioeconomic impact assessment of Rule 74.11,³ the Ventura County Air Pollution Control District concluded that there would be no impact of the rule on employment and the regional economy. It is reasonable to assume that a similar conclusion can be made as a result of the adoption of proposed new Rule 69.5.1, considering that complying equipment is widely available and the cost differential will not significantly affect residences or businesses in San Diego County.

IX. AVAILABILITY AND COST-EFFECTIVENESS OF ALTERNATIVES

There are mainly two possible alternatives for proposed new Rule 69.5.1 – adopt a less stringent rule or adopt a more stringent rule.

The first alternative of adopting a less stringent rule is not a reasonable alternative. Other air districts in California currently have adopted rules that regulate units to the same emission standards as those in proposed new Rule 69.5.1. Thus, a less stringent rule would be inconsistent with State law that requires the District to adopt all feasible control strategies to reduce NOx emissions.

The second alternative of adopting a more stringent rule is not technologically feasible. There are no water heaters commercially available at this time that can operate with a NOx emissions limit significantly less than the 10 ng/J proposed in proposed new Rule 69.5.1.

X. CONCLUSION

Proposed new Rule 69.5.1 will not negatively impact affected residences or industries, including small businesses. It will not affect employment or the economy of San Diego County, but will bring considerable environmental benefits by reducing emissions of nitrogen oxides that are precursors of ground level ozone, a major component of photochemical smog.

References

1. California Energy Demand 2010-2020 Commission – Adopted Forecast, December 2009.
2. California Energy Commission, Demand Analysis Office.
3. Ventura County Air Pollution Control District, Rule 74.11 – Natural Gas-Fired Water Heaters, Staff Report, November 2009.