

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Staff Report

Proposed New

**Regulation 6: Particulate Matter,
Rule 3: Wood-burning Devices**

Amendments to

**Regulation 1: General Provisions and Definitions, and
Regulation 5: Open Burning**

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I. EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (Air District) is proposing a new rule, Regulation 6: Particulate Matter, Rule 3: Wood-burning Devices. The purpose of the rule is to limit emissions of particulate matter (PM) and visible emissions from wood-burning devices as part of an overall wood smoke reduction program within the jurisdiction of the Air District. In addition, the Air District is proposing minor changes in current Regulation 1: General Provisions and Definitions and Regulation 5: Open burning, which are discussed later in this report.

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide (SO₂) and lead. The National Ambient Air Quality Standards (NAAQS) were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards, and in the cases of PM₁₀ and SO₂, far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

During recent winters, the Bay Area Air Basin exceeded the 24-hour PM_{2.5} NAAQS an average of 17 days. Air District staff anticipates a non-attainment designation for this newly lowered standard. The emission limitations in this proposed rule are intended to address this expected non-attainment status and reduce the adverse public health impacts of PM in the Bay Area. PM is of concern because it can enter nasal passages and the lungs and cause serious health effects such as aggravated asthma, nose and throat irritation, bronchitis, lung damage, and premature death. People with respiratory illnesses, children and the elderly are more sensitive to the effects of PM, but it can affect everyone.

The Bay Area experiences its highest PM concentrations in the winter, especially during the evening and night time hours. Wood-burning is the single greatest source contributing to the PM concentrations, based on an analysis of chemical composition of sampled airborne PM combined with emission inventory data. Emission calculations indicate wood smoke contributes only about 10 percent of total PM emissions on an annual basis, but approximately 33 percent of total wintertime PM_{2.5}. Reductions in wood smoke emissions will be necessary to achieve clean air on a district-wide basis. Staff estimated the expected emission reduction of PM_{2.5} due to implementation of this rule will be 983 tons per year or 716 tons in the wintertime (November through February).

A draft Environmental Impact Report (EIR) was prepared to investigate and discuss elements of the proposed regulation that could result in any potential environmental impacts. The EIR concludes that the proposed regulation would have no adverse environmental impact. A socioeconomic analysis mandated by Section 40728.5 of the California Health and Safety Code was prepared by Applied Economic Development, Berkeley, California. The analysis concludes that there are no significant impacts resulting from changes in household spending habits, meaning small businesses, particularly retail and services, are not disproportionately impacted by the rule.

The proposed rule would reduce wintertime PM_{2.5} levels by curtailing wintertime wood-burning emissions from all wood-burning devices, which includes fireplaces, EPA certified devices, pellet stoves and masonry heaters, and achieve additional reductions by requiring cleaner burning technologies in new construction. In addition, burning will be improved by limiting the moisture content of wood used throughout the year in wood-burning devices.

Currently, there is no Air District rule that directly limits emissions from wood-burning devices. Air District Regulation 1: General Provisions and Definitions has historically excluded regulation of any fires associated with residential heating and will be amended to remove this exclusion. An amendment to existing Regulation 5, Open Burning, will remove an exemption for outdoor wood fires set for recreational purposes and create a requirement to curtail burning outdoors during the winter.

II. BACKGROUND

A. Introduction

Wood-burning devices contribute substantial amounts of fine airborne particulate matter into the atmosphere. It is during the winter months, with certain meteorological conditions, that these devices contribute up to one third of total fine airborne particulate matter in air and threaten the public health.

Wood-burning devices are defined as any wood-burning stove or heater, pellet-fueled device, fireplace, or any indoor permanently installed device burning any solid fuel for space-heating or aesthetic purposes. In the process of burning wood or a solid-fuel product, such as manufactured logs, pressed logs or wood pellets, these devices must vent gases and combustion by-products through a flue or chimney. These emissions contribute to air pollution including PM.

Emissions from wood-burning devices can vary depending on a variety of factors, including the design and age of the wood-burning device, the type and amount of fuel used, and the ability of the user to operate the device in accordance with manufacturer's specifications. This variation may be seen in Figure 1, "Relative Emissions of Fine

Particles”. The graph shows the average fine particle emissions in pounds per million Btu (British thermal unit, a heat value unit) for a variety of wood-burning devices. The figure also compares wood-burning devices to oil and gas-fueled furnaces.

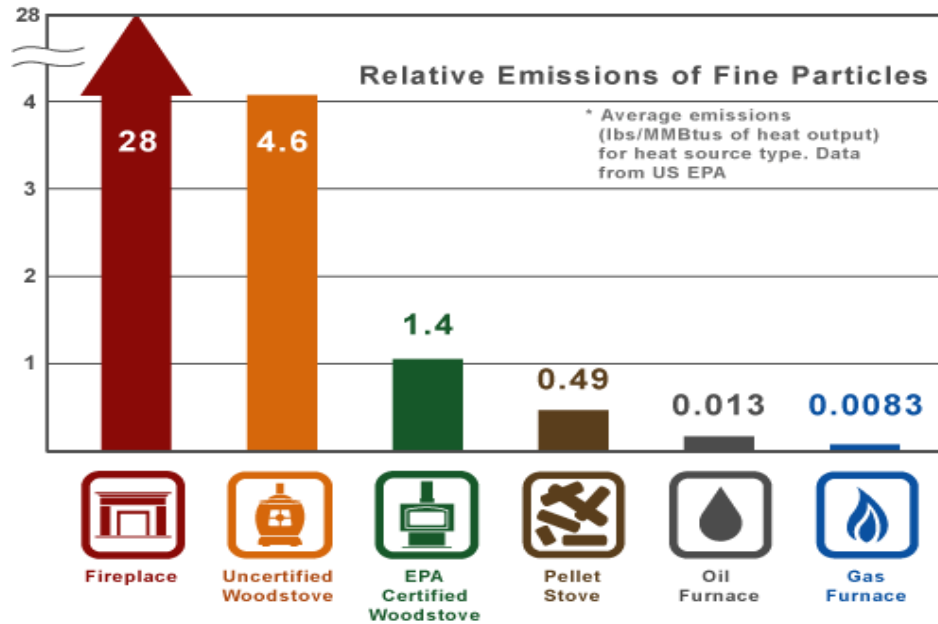


Figure 1 Relative Emissions of Fine Particles, by device type.
 (<http://www.epa.gov/airprogram/oar/woodstoves/refptext.html>)

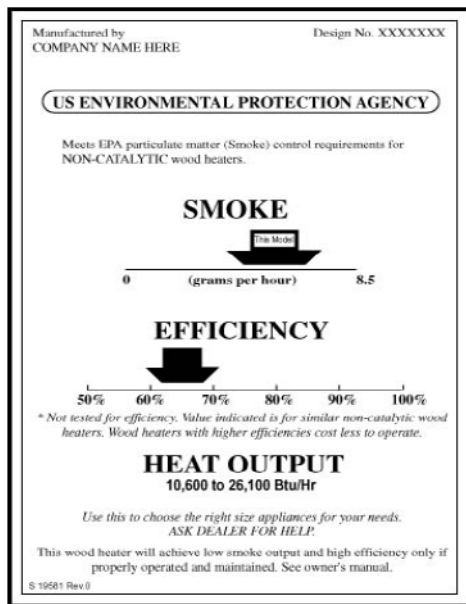
The United States Environmental Protection Agency (EPA) has established new source performance standards for residential wood-burning devices since 1988, including certification procedures.¹ The emission limits and effective dates for wood stoves are shown in Table 1.

¹ Most wood-burning stoves to be sold in the United States must be certified by the U.S. EPA in accordance with Title 40 of the Code of Federal Regulations (CFR), Part 60, Subpart AAA -- Standards of Performance for New Residential Wood Heaters. A list of certified devices, including those that are exempt from certification but meet the emission standards, is maintained by EPA at <http://www.epa.gov/woodstoves/index.html>

	Wood Stove Type	
	Catalytic	Non-Catalytic
Phase I		
Emission Limit (gr/hr)	5.5	8.5
Effective date for mfg	7/1/88	7/1/88
Effective date for sales	7/1/90	7/1/90
Phase II		
Emission Limit (gr/hr)	4.1	7.5
Effective date for mfg	7/1/90	7/1/90
Effective date for sales	7/1/91	7/1/91

Table 1. Summary of New Source Performance Standards for Residential Wood Stoves. (AP42 for Woodstoves, July 29, 1996)

An EPA certified wood stove can be identified by a temporary paper label attached to front of the wood stove and a permanent metal label affixed to the back or side of the wood stove (Figure 2.) One purpose of certification is to verify and document, in accordance with standardized testing by an independent body, the wood-burning device is designed such that the PM emissions to the atmosphere are less than the applicable emission limits for the specific device type.



Temporary Wood Stove Label



Permanent Wood Stove Label

Figure 2. Example of an EPA certification on a wood-burning stove.

Not all wood-burning qualify for EPA certification; however many manufacturers recognize the advantage of certification, which is generally considered proof of cleaner

burning technology. EPA has recognized this demand and is developing test protocols for devices which are not required to get EPA certification, such as masonry heaters. The Air District supports this approach since it leads to cleaner burning devices and provides a national standard for clean burning devices under EPA guidance. These devices could be allowed for new construction, either in a new structure or as part of a remodel in the District, should certain models be able to demonstrate that they can meet future, voluntary EPA approved emission targets according to EPA approved test methods for low-mass fireplaces and masonry heaters.

B. Emissions Inventory

Burning wood dates back to early human history and, since it is a natural process, is sometimes thought to have a benign impact upon human health (Naeher, et al 2007). However, combustion processes, including the combustion of wood in wood-burning devices, are a major source of anthropogenic air pollution, including hydrocarbons, PM, toxic compounds, carbon monoxide, nitrogen oxides, and sulfur dioxides.

PM is a mixture of very small liquid droplets and solid particles suspended in the air. Negative health effects are linked to both droplets and particles. Numerous studies have shown that mortality and hospital admission related to pulmonary and cardiovascular disease increase on days with high particulate air pollution levels (Dominici et. al, 2006; Sällsten et. al, 2006). In addition to premature death in people with heart or lung disease, the EPA has conducted literature surveys on health studies that have linked exposure to PM, especially fine particles. Their synopsis discusses these studies and additional findings that link fine particulate to several other significant health problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks.

The EPA lowered the NAAQS after reviewing numerous health studies examining the deleterious impact of fine airborne particulate matter on public health. Air District staff conducted a peer-reviewed literature search to update staff's understanding of the most recent findings on the public health impacts of fine particulate. These studies find links to lung function decrements, inflammation and permeability, susceptibility to infection, cardiac affects, increased asthma attacks, more use of medicines, more doctor and hospital visits, increased absenteeism, and increased premature mortality within sensitive receptors. Several of these studies are listed in the Appendix of this report.

Residential wood combustion is an important contributor to ambient fine particle levels

in the United States (Fine 2004). Through the use of ambient PM monitoring (see Appendix F for Air District monitoring site map), chemical mass balance, Carbon-14 dating combined with Bay Area winter 2005 emission data, staff has estimated wood smoke as the single greatest contributor (~33%) to PM_{2.5} on peak days in the Bay Area. A breakdown of sources contributing to PM is shown in Figure 2 (Fairly 2008).

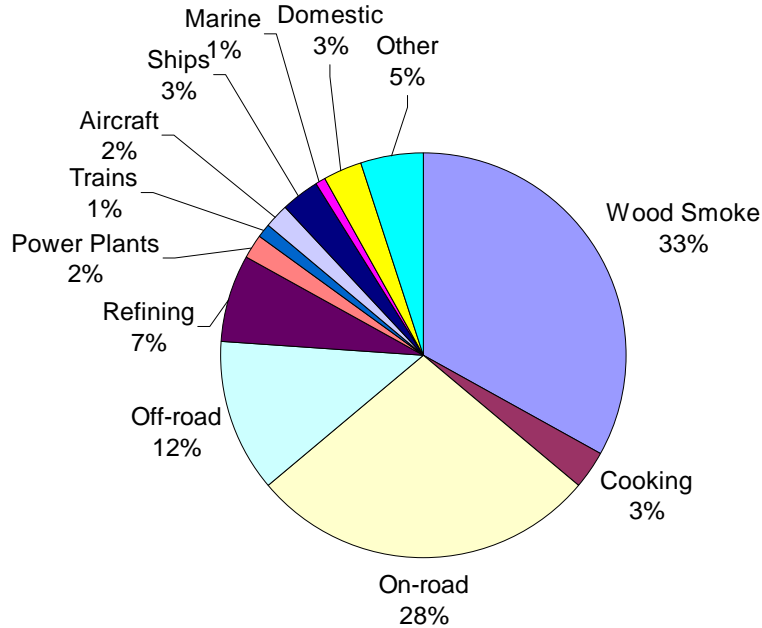


Figure 2. PM_{2.5} Concentration on Peak Days by Constituent in the Bay Area

To estimate the amount of PM coming from wood-burning, Air District staff used data from telephone survey results from Bay Area residents from multiple years. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor based on EPA documentation in AP-42, were then used to generate a PM estimate for each county in the Bay Area. These data are summarized in Table 2 in tons per day (tpd) and tons per year (tpy), for both PM₁₀ and PM_{2.5}.

County	Wood Stove, Inserts and Pellet Stoves PM ₁₀	Fireplace PM ₁₀	Wood Stove PM _{2.5}	Fireplace PM _{2.5}
Alameda	0.03 tpd	2.28 tpd	0.03 tpd	2.19 tpd
Contra Costa	0.76 tpd	4.32 tpd	0.73 tpd	4.15 tpd
Marin	1.03 tpd	0.37 tpd	0.99 tpd	0.36 tpd
Napa	0.33 tpd	0.41 tpd	0.32 tpd	0.39 tpd
San Francisco	0.03 tpd	0.28 tpd	0.03 tpd	0.27 tpd
San Mateo	0.38 tpd	0.70 tpd	0.36 tpd	0.67 tpd
Santa Clara	0.65 tpd	3.11 tpd	0.62 tpd	2.99 tpd
Solano (Part within Air District)	0.05 tpd	0.89 tpd	0.05 tpd	0.85 tpd
Sonoma (Part within Air District)	1.27 tpd	1.43 tpd	1.22 tpd	1.37 tpd
Total Emissions Bay Area	4.54 tpd	13.80 tpd	4.36 tpd	13.25 tpd
Total Emissions Bay Area	1657 tpy	5037 tpy	1591 tpy	4836 tpy

Table 2. Summary of PM emissions from wood-burning devices by county (based on 2005 data).

Because the category of PM₁₀ also includes PM_{2.5}, a large portion of PM₁₀ particles are also PM_{2.5} particles (Houck 1998). Therefore, the majority of PM from wood smoke is fine particles. It is these fine particles that are of greatest concern to public health according to recent studies (Woodruff 2006).

C. Available Control Technology

Increased PM emissions from wood-burning result from inefficient combustion of the wood. Increasing combustion efficiency reduces emissions and reductions in PM emissions can be achieved through use of cleaner burning wood devices and proper burning techniques.

Wood stoves are wood-burning devices that are enclosed to control combustion. EPA-certified stoves employ either a catalytic or non-catalytic system to increase combustion of the exhaust stream. These units are either stand alone or installed into a building's walls. A wood-burning insert can be placed in either a new or an existing fireplace.

Some EPA-certified stoves utilize a catalyst to reduce the ignition temperature so that additional combustion continues to occur in the gases exhausted from wood stoves. A catalyst in a stove is a ceramic honey-combed combustor that is coated with a noble metal, such as platinum or palladium. These types of stoves require maintenance and eventually catalyst replacement during the lifetime of the stove in order to operate properly. The EPA certification emission limit for catalytic stoves is 4.1 grams of particulate matter per hour.

EPA-certified non-catalytic stoves, on the other hand, achieve low-emission, cleaner burning by decreasing the firebox size, increasing turbulence (mixing) within the firebox, and adding baffles as well as secondary burn tubes to combust exhaust gases. These stoves still require maintenance to operate effectively, but do not have a catalyst to

replace. The EPA certification emission limit for non-catalytic stoves is 7.5 grams per hour.

Pellet stoves were developed during the 1970's to provide additional alternatives to fossil fuel. These devices burn pellets very cleanly and do not require EPA certification, although many manufacturers have the devices certified by the EPA. Pellet stoves burn wood that has been compressed into pellet form for combustion and easy storage. Some pellet stoves burn products other than wood, such as wheat or corn. In addition to the need to be vented to the outside of the structure, pellet stoves require electricity to utilize active air and fuel management systems to control combustion efficiency.

A pellet stove is a factory-built, highly engineered, wood-burning device that utilizes solid-fuel pellets usually made from wood waste products. Some newer pellet stoves can now burn agricultural products such as corn or other biomass renewable energy pellets. Some pellet stoves are not required to be EPA-certified due to either the high air-to-fuel ratios (a high volume of air moving through the device relative to the amount of fuel) or high burn rates (high rate of fuel combustion) they utilize. Pellet stoves control both fueling rates and combustion rates with engineered machinery such as screw conveyors and air blowers. Modern pellet stoves by design are cleaner burning. In fact, some pellet stoves have been EPA certified under the exact same testing methods used by regular wood-burning stoves and inserts, thereby demonstrating equivalent low PM emission levels to EPA-certified devices. For most modern pellet stoves, their emissions have been demonstrated to be in the lower range, lower PM emission levels, of the EPA certification requirements.

A masonry heater is a site-built, or site-assembled, solid-fueled heating device consisting of a firebox, a large masonry mass, and a maze of heat exchange channels. While a masonry heater may look like a fireplace, it operates differently. It stores heat from a rapidly burning fire within its masonry structure, and slowly releases the heat over time. The suggested fueling method is to burn short, hot fires with many hours in between fires. Masonry heaters are not required to be EPA certified due to the high air-to-fuel ratios they utilize and the weight of these devices. While these devices cannot be emission tested using the same testing methods as used for EPA certified devices and many pellet stoves, a conversion is available. This conversion method, however, is not widely accepted.

The EPA does not have any formal or required certification process, mandatory or voluntary, for these devices yet. Until such time as EPA has such a process, staff is proposing that masonry heaters not be considered approved devices in the proposed regulation. However, the proposed rule has a provision to allow masonry heater to be allowed in new construction, either in a new structure or as part of a remodel, should EPA develop a certification process in the future for these devices.

Proper burning techniques focus on proper fuel selection and fire-building. Dry or “seasoned” wood has a moisture content of 20 percent or less. This wood burns more efficiently since less heat is required to vaporize water in the wood. Proper wood placement for a fire also improves the combustion efficiency. Requiring proper labeling of seasoned wood for sale will provide the consumer with the necessary information on how to comply with mandatory wood-burning curtailment. Overall, an efficient fire leads to more complete combustion, lower emissions and lower fuel costs. Table 3 shows the range of efficiencies of various wood heater types.

Wood Heater Type	Efficiency %	
	Range	Average
Conventional	41.7 – 63.1	53.6
Non-catalytic	66.2 – 72.6	68.3
Pellet - certified	57.6 – 75.2	67.5
Pellet - exempt	33.4 – 70.5	55.5
Catalytic	63.0 - 78.4	67.9
Masonry	54.0 – 65.0	58.4

Table 3. Summary of Wood Heater Net Efficiencies (AP42 for Woodstoves, July 1996)

D. Regulatory Framework

Wood smoke has been a concern for the Air District as scientific research began establishing a stronger link between emissions from wood combustion and public health. Since 1991, the Air District has promoted various voluntary programs to reduce wood smoke emissions. These programs include a voluntary curtailment program, an annual random public survey to assess wood-burning practices in the Bay Area and a model ordinance for local governments to adopt to reduce PM from wood smoke. The Air District has also directed a financial incentives program on a limited basis promoting cleaner burning technologies.

The voluntary curtailment program is called Spare the Air Tonight (STAT). The program advises Bay Area residents to not burn wood on evenings with meteorological conditions leading to increased PM levels that already impact public health. The Air District has also conducted an annual wintertime survey following STAT advisories in order to ascertain and document the public’s attitudes and behavior with respect to burning wood.

The Air District developed and promoted a model ordinance that cities and counties may adopt to further reduce wood smoke impacts in their community. The model ordinance includes the following suggested elements:

- curtails burning during STAT advisories;
- specifies criteria for cleaner wood-burning devices; and

- limits fuel type to materials appropriate for wood-burning devices (no garbage, etc).

Local ordinances, based on the Air District’s model ordinance to reduce PM from wood smoke, have been adopted by 40 of the 107 Bay Area cities and eight of nine counties. The local ordinances that have been adopted vary in the degree to which they incorporate elements of the model ordinance. Those jurisdictions that have adopted an ordinance with a mandatory, as opposed to voluntary, curtailment provision are shown in Table 4, along with other provisions of their ordinances.

CITY	Adopted	Curtailment Action upon STAT Advisory	Certified Device in New Construction	Certified Device in Remodels	Prohibits Conversion from Gas to Wood
Fremont	Jul 02	Mandatory	✓	✓	✓
Gilroy	Mar 05	Mandatory	✓	✓	
Los Gatos	Dec-92	Mandatory	✓	✓	
Martinez	Sep 05	Mandatory	✓	✓	✓
Mill Valley	Sep 05	Mandatory	✓	✓	✓
Oakland	May 05	Mandatory	✓		✓
Rohnert Park	Sep 04	Mandatory	✓	✓	✓
San Pablo	Dec 01	Mandatory	✓	✓	✓
Union City	Apr-99	Mandatory	✓	✓	✓

Table 4. Cities that have adopted a mandatory requirement in local ordinances.

The Air District will continue to support adoption of ordinances in individual jurisdictions. No provision in the proposed new Regulation 6, Rule 3 prohibits a local jurisdiction from adopting a more stringent requirement in a local ordinance.

The Air District co-sponsored and managed a financial incentive, or “wood stove change-out,” program in Santa Clara County as part of an air quality mitigation program required by the California Energy Commission. Rebates were offered to residents to remove non-EPA-certified wood-burning devices, install only EPA-certified devices, or to retrofit wood-burning fireplaces with natural gas fireplaces. More recently the Air District offered financial incentives for upgrades throughout the entire Air District. The District distributed \$500,000 in two phases; a pilot phase in January 2008 and an enhanced program in April 2008. The District’s Cleaner Burning Technology Incentives Program will provide similar incentives in the future.

In developing the proposed regulation, the Air District reviewed similar regulation in other Air Districts. Table 3 is a summary of the requirements at other air districts. The table heading identifies six elements. These six elements are common in regulations to reduce wood smoke and are described in detail later in this report. The following is a brief description of each standard:

- **Mandatory Solid Fuel Burning Curtailment:** Prohibits burning wood or other solid fuel during periods when air quality is unhealthy.

- Prohibition of Exceeding Visible Emission Limit: Places limits on the density of emissions resulting from wood or other solid fuel combustion.
- Sale, Transfer or Installation Criteria for Devices: Establishes specifications for wood-burning devices which are to be sold, resold or installed within the air district.
- Criteria for Devices in New Building Construction: Requires new building construction to install wood-burning devices with cleaner burning emissions criteria or gas-fueled devices.
- Prohibition against Burning Garbage or Certain Fuel: Prohibits the burning of garbage and/or other materials not suitable as a fuel in a wood-burning device.
- Requirements for Sale of Seasoned Wood: Establishes criteria for the sale of firewood, such as having a moisture content of less than 20 percent to reduce emissions when combusted.

AIR DISTRICT	RULE	CONTROL ELEMENT					
		Mandatory Solid Fuel Burning Curtailment	Prohibition of Exceeding Visible Emission Limit	Sale, Transfer or Installation Criteria for Devices	Criteria for Devices in New Building Construction	Prohibition Against Burning Garbage or Certain Fuel	Requirements for Sale of Seasoned Wood
San Joaquin Valley	4901	✓	✓	✓	✓	✓	✓
Great Basin	431	✓	✓	✓	✓	✓	
Sacramento	417			✓		✓	✓
	421	✓	N/A	N/A	N/A	N/A	N/A
Yolo-Solano	2.40			✓	✓	✓	✓
Northern Sonoma	R4-1			✓		✓	✓
Monterey Bay	400					✓	
Shasta	3.23			✓	✓	✓	
Butte	207			✓	✓	✓	
Feather River	3.17			✓	✓		
South Coast	445			✓	✓	✓	

Table 5. Other Air Districts' Wood Smoke Reduction Programs.

The control elements shown in the column headings of Table 5 reflect the breadth of current rules regulating wood smoke. The proposed Regulation 6, Rule 3, draws from those control elements which have proven effective in maximizing the reduction of PM from wood smoke and at the same time minimizing economic or lifestyle adjustments required of impacted stakeholders. Stakeholders include individual residents and organizations such as manufacturer and vendor-based industries and hearth-related organizations.

III. REGULATORY PROPOSAL

The proposed new Regulation 6, Rule 3, would:

- Restrict operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove or fireplace insert on specific days during the winter when air quality is forecast to exceed the National Ambient Air Quality Standard for PM_{2.5}.
- Limit excessive visible emissions from wood-burning devices.
- Require cleaner burning technology (EPA Phase II certified wood-burning device, pellet stove, approved low-mass fireplace or masonry heater) when wood-burning devices are sold, resold or installed.
- Require cleaner burning technology (EPA Phase II certified wood-burning device, pellet stove, approved low-mass fireplace or masonry heater) if wood-burning devices are permitted for installation in new building construction.
- Prohibit the burning of garbage, plastics and other inappropriate types of materials.
- Require labeling and disclosure of the moisture content on wood sold for use within District, including instructions on how to dry the wood if it has a moisture content greater than 20 percent by weight.
- Require a warning label on packages of wood and other solid fuels (such as pressed logs and pellets) stating ~~the use of the product can be harmful to public health and~~ a message to check Air Quality status before burning these products.

The proposed new Regulation 6, Rule 3, provides limited exemptions from the curtailment standard.

The proposed rule requires public awareness information to be included with sale of each wood-burning device addressing proper use of the device and information on the health effects of wood smoke. Wood-burning device manufacturers and sellers are required to provide documentation that the device meets the emission limits of this proposed rule. Sellers of firewood must label firewood or solid fuel with a health warning regarding the harmful effects of wood smoke on public health. Sellers of seasoned firewood must properly label firewood as seasoned. Sellers of non-seasoned wood must properly label the wood as not appropriate for burning and provide information on how to properly dry the wood before burning.

The proposed rule includes standard test methods for the determination of visible emissions, the moisture content of wood, the amount of particulate emissions from the use of a wood-burning device, and a reference to the EPA certification and equivalency process.

Mandatory Solid Fuel Burning Curtailment

This standard would prohibit the operation of a wood-burning device whenever the Air District forecasts an excess of the NAAQS for PM_{2.5} levels. Forecasts for mandatory curtailments will be posted on the Air District's website or provided by news releases, phone-line or email list-serve as well as other means deemed appropriate by the Air District.

The proposed rule has a limited exemption from this standard for a person:

- whose wood-burning device is the only source of space heat; or
- located where natural gas is unavailable; or
- located where electrical service is unavailable (which includes power outages).

Visible Emission Limitation

The Ringelmann No. 1 limit is a visible emission standard equivalent to 20% opacity. This standard will limit excessive visible emissions from chimneys, stovepipes or flues based on visual observation of emissions which exceed at least six minutes in any one-hour period. The proposed rule has a limited exemption for emissions from the startup of a new fire for a period that is not to exceed twenty minutes in any four-hour period.

The Air District will conduct outreach to the public on determining excessive smoke opacity, using clean burning techniques and other methods to minimize wood smoke.

Criteria for Sale, Resale or Installation of Wood-burning Devices

This standard applies to both used and new devices. A wood-burning device shall not be sold, resold, transferred or installed within the Bay Area unless it is one of the following:

- A U.S. EPA Phase II certified wood-burning device;
- A pellet-fueled device;
- A low mass fireplace, masonry heater, or other wood-burning device of a make and model that meets EPA emission targets and is approved by the Air District.

Low mass fireplaces, or zero clearance fireplaces which are commonly installed in new housing construction, and masonry heaters or other wood-burning devices would be approved devices if they can demonstrate, under EPA approved test methods under development for low mass fireplaces, that they meet future, voluntary emission reductions. The emission testing methods for this class of wood-burning devices are only comparable methods to EPA certification test methods and the emission test results must be converted. It is the test results conversion, for comparison with EPA certification emission levels that is not widely accepted.

Northern Sonoma County Air Pollution Control District staff submitted comments to Air

District staff raising concerns over the emission testing methods for masonry heaters. While masonry heaters can achieve lower emissions than conventional fireplaces, masonry heaters cannot be certified under the same test methods as EPA-certified stoves. The EPA does not have any formal certification process, mandatory or voluntary, for these devices yet. Until such time as EPA has such a process, staff is proposing that masonry heaters not be considered cleaner burning technology in the proposed regulation. However, the proposed rule has a provision to allow masonry heater to be allowed in new construction, either in a new structure or as part of a remodel, should EPA develop a certification process in the future for these devices.

The voluntary “EPA Low-mass Fireplace Program” is being developed by the EPA utilizing a stakeholder process which considers the mutual needs of EPA, state regulators and device manufacturers. In the first phase of this program, an emission limit of 5.1 g/kg is being proposed with appropriate emission testing methods that can be approved by EPA. While masonry heaters are not currently included in this program, there are proposals to include them and masonry heaters could be allowed for new construction, either in a new structure or as part of a remodel in the District, should certain models be able to demonstrate that they can meet future, voluntary EPA approved emission targets according to EPA approved test methods for low-mass fireplaces and masonry heaters.

Criteria of Wood-burning Devices in New Building Construction

This proposed standard specifies that a wood-burning device installed in new construction must be one of the following:

- A U.S. EPA Phase II certified wood-burning device;
- A pellet-fueled device;
- A low mass fireplace, masonry heater, or other wood-burning device of a make and model that meets EPA emission targets and is approved by the Air District.

This standard applies to new construction where installed in a new building or structure or as part of a remodel. The standard only affects devices that burn wood or other solid fuel. Any device that operates on natural gas or electricity is allowed under this standard.

Prohibition Against Burning Garbage or Inappropriate Materials

This standard requires that the following materials cannot be burned under any circumstance: garbage, chemically treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, glossy and/or colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device.

Retail Sale of Wood

This standard requires that seasoned wood supplied or offered for sale must contain a moisture content of 20 percent or less by weight for cleaner burning. This requirement will be the responsibility of any manufacturer, supplier or retailer of seasoned firewood to ensure moisture content is below 20 percent by weight and appropriate for burning.

Wood that does not have a moisture content of 20 percent or less by weight must be labeled as unseasoned wood and include instructions on how to properly dry the wood before burning. This standard focuses on a manufacturer, supplier or retailer of firewood and not individual residents. The Air District will conduct outreach, however, to individuals to assist them on learning how to season wood.

Administrative Requirements

The Air District has sole authority over enforcing the proposed regulation and will independently verify any violation before issuing a Notice of Violation or taking other enforcement action.

Any person or builder that sells a device or a new building with a wood-burning device must provide public awareness information regarding the proper use and maintenance of the wood-burning devices as well as information on the adverse public health impacts. The following statement must be included in the information provide, “Wood smoke contains harmful particulate matter (PM) which is associated with numerous negative health effects.”

The manufacturer or seller of any wood-burning device must provide documentation to any purchaser that the device is U.S. EPA Phase II certified or that the device meets the equivalent U.S. Phase II emission limits or meets the emission limits specified in the proposed Regulation 6, Rule 3. EPA specifies the requirements for documentation in 40CFR60, Subpart AAA.

Six months following rule adoption, the following requirements become effective:

- Any seasoned wood packaged for sale must include a package label identifying the wood as having a moisture content of 20 percent or less by weight. Seasoned wood, with the exception of those intended for cooking (such as charcoal) must also be labeled stating that wood smoke contains harmful PM which is associated with numerous negative health effects. Seasoned wood must be sold with a label attached that has the following statement: “This wood meets air quality regulations for moisture content to be less then 20 % (percent) by weight for cleaner burning.”
- Unseasoned wood must be identified as having a moisture content of greater than

20 percent as well as indicate this wood is not appropriate for burning. Informational material will be required to be distributed with unseasoned wood. This material will educate the consumer on the methods required to properly dry the wood. Unseasoned wood must be sold with a label attached that has the following statement: "This wood does NOT meet air quality regulations for moisture content and must be properly dried before burning."

- All solid fuel must be labeled with the following message: ~~"HEALTH WARNING: This product and similar solid fuel products produce particulate matter when burned which can be harmful to public health. Your city, county or air pollution control district may prohibit the use of this product and wood burning on days when air pollution levels may be high. Please check before using. Use of this and other solid fuels may be restricted at times by law. Please check [Toll-Free #] or [web address] before burning."~~

Documentation

Any person claiming an exemption from the Mandatory Solid-fuel Curtailment requirement must be able to provide documentation or records explaining why the wood-burning device is the only source of space heat for the structure and whether the situation is temporary or permanent to the Air District upon request.

Test Methods

Visible emissions shall be determined in accordance with the Air District's Manual of Procedures-Volume 1 – Enforcement Procedures, Evaluation of Visible Emissions.

Moisture content of wood shall be determined by ASTM Test Method D 4442-92 or a hand-held moisture meter operated in accordance with ASTM Test Method D 4444-92, Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters.

The methods used to determine particulate emissions and EPA certification or determination of equivalency shall be performed in accordance with EPA Method 28, 5G, 5H, EPA Guidance Document for Residential Wood-Burning Devices or other EPA approved methodology.

Amendments to Existing Regulations

Regulation 1 establishes general provisions and definitions which apply to all Air District rules and regulations. Regulation 1 currently excludes any fire for residential heating from any Air District requirements. An amendment is being proposed to eliminate this exclusion in order to allow regulation of indoor fires.

Currently, Regulation 5 regulates open burning, or fires conducted outside of buildings.

However, recreational fires are exempt provided only clean and dry wood is used. In order for a mandatory curtailment to be consistent, the curtailment must be applicable also to outdoor recreational fires. Therefore, an amendment to Regulation 5 is being proposed to remove the exemption for recreational fires. Fires used outdoor for residential cooking will not be affected.

IV. EMISSION REDUCTIONS

Emission reduction calculations for the proposed regulation are based upon baseline emission inventory data for wood-burning devices in the Bay Area. Survey data and household population estimates from the ABAG for 2005 were used. Staff estimates 983 tons per year reduction of PM_{2.5} from implementation of the proposed rule. A discussion of the annual average emission reduction associated with each requirement of the proposed regulation follows:

Mandatory Solid Fuel Burning Curtailment

The mandatory curtailment requirement will reduce emissions from solid fuel burning devices during periods when the National Ambient Air Quality Standard is forecast to be exceeded. The requirement will decrease fine PM concentrations during critical winter months when PM air pollution reaches unhealthy levels. Typically, emission reductions are estimated and reported in tons of pollutant per year. Therefore staff calculated the reductions based on the seasonal impact of the proposed standard for the winter burn season of November through February. Staff used the total annual emissions from Table 1 combined with survey results on burning patterns that 78% of the total solid fuel burned occurs in the wintertime.

Over a period of 17 curtailment days (average number of days in excess of NAAQS for PM_{2.5} in past five winter season in Bay Area) during a 120 day long wintertime burn season, the PM_{2.5} reductions are calculated to be 716 tons per wintertime burn season as well as for the annual average since the curtailment only applies from November through February. This is at a 100% compliance rate.

Visible Emission Limitation

Air District staff has not calculated an emission reduction value for this standard due to the lack of sufficient data. There are not consistent quantitative correlations between opacity and PM mass. This lack of correlation is largely due to the various flow rates from chimneys and stove pipes, combined with changing or variable particulate size and composition. A Ringelmann No. 1 standard (20% opacity), however, is consistent with visible emission standards applied to industrial sources and indicates efficient solid fuel combustion. Staff anticipates the cumulative effect of this standard will contribute to lower local and overall ambient PM concentrations.

Criteria for Sale, Transfer or Installation of Wood-burning Devices

To calculate the emission reduction on a per wood-burning device basis, calculations were based on assumptions of 50 grams per hour of PM_{2.5} for high-emitting or non-certified devices and 5 grams per hour of PM_{2.5} for low-emitting or certified devices. Therefore, the reduction is calculated as the difference between the two rates, or 45 grams per hour.

According to Air District survey results, data indicates likely annual burn times in residences range from 30 to 150 hours per year. Therefore, in pounds per year based on a per unit basis for upgraded units, estimated reductions will be 3 to 15 pounds per year of PM_{2.5} per wood-burning device.

The Air District conducted a 'change out' program to assist individuals upgrade to cleaner burning technology. This program occurred in two phases and is ongoing. In the first phase 185 units were converted to cleaner burning technology; 76% were natural gas fueled devices. In the second phase, to date, 139 out of 666 units have been converted to natural gas fueled devices. A gas fueled device is the cleanest burning device in terms of particulate matter, and therefore provides the greatest emission reduction.

This requirement prevents the sale of non-EPA certified wood burning devices or high emitting devices. Some wood stoves are engineered to purposely have an air-to-fuel ratio which exceeds 35 to 1. Since these devices are 'exempted' from EPA certification, the EPA does not prohibit their sale or use. This requirement prevents these high emitting devices from being sold within the Air District.

Criteria of Wood-burning Devices in New Construction

Air District staff anticipates that requiring installation of wood-burning devices which are EPA certified or designated low emitting into any new construction will reduce annual PM_{2.5} by approximately 58 tpy in new buildings, structures and new wood-burning devices in remodels. This emission reduction is based on survey results indicating the type of fuel Bay Area households are burning and the frequency at which the households are burning. These trends were applied to ABAG household projections forward looking to 2015 from 2005.

To calculate the emissions reduction projected for the requirement for cleaner burning devices in new construction, staff started with two assumptions:

- (1) Current emission levels carried forward to 2015 without the New Construction Standard will increase by 2.8 tpd of PM_{2.5} over ten years,
- And,
- (2) Lower emission levels projected forward to 2015 with the New Construction Standard will increase by 1.2 tpd of PM_{2.5} over ten years.

The difference between (1) and (2) is 1.6 tpd of PM_{2.5}. The annual results are achieved by multiplying 1.6 by 365, and then dividing by 10 to achieve per year averages which are summarized in Table 6.

Process description	PM_{2.5} (tpy)
(1) Projected emissions WITHOUT new construction requirement	102
(2) Projected emissions WITH new construction requirement	44
Bay Area Reduction [Difference between (1) and (2)]	58

Table 6. PM reduction annualized amounts based upon new household population growth.

Prohibition Against Burning Garbage, Non-Seasoned Wood or Certain Materials

The prohibition against burning garbage or other materials not intended for wood-burning device use has no emission reduction calculated. This standard, however, is anticipated to reduce toxic air contaminants from residential burning.

Requirements for Seasoned Wood

Air District staff anticipates that burning seasoned wood increases combustion efficiency and decreases emissions. Seasoned wood has a moisture content of less than 20% by weight.

According to Air District survey results, staff estimates that 6.5% of all Bay Area residents burned fresh cut, non-seasoned firewood. Of those that were unsure of their firewood source, Air District staff approximated that half burned unseasoned wood. The total annual emissions (see Table 2) from both wood stoves (including inserts and pellet stoves) (1591 tpy) and fireplaces (4836 tpy) is 6427 tpy of PM_{2.5}. Therefore, approximately 6.5% of total annual emissions from wood burning is from non-seasoned wood and equals 417 tpy of PM_{2.5}.

In “A comparison of Masonry Fireplace Emissions Testing Methods”, seasoned wood was demonstrated to emit approximately 50 percent less PM_{2.5} than non-seasoned wood (Senf, 1995) so staff estimated that 50 percent emissions from non-seasoned wood or 209 tpy of PM_{2.5} can be reduced with this requirement.

Reductions Summary

Table 7 below summaries the estimated reductions based on quantifiable reductions on the proposed regulation. Other requirements, while not quantified, are anticipated to better protect public health through emissions reductions. Staff will continue to work toward quantifying total reductions.

Proposed Regulation Requirement	Estimated TPY Reduction of PM_{2.5}
Mandatory Curtailment	716
New Construction	58
Requirements for Seasoned Wood	209
Total	983

Table 7. Summary of reductions based on proposed rule requirements.

V. ECONOMIC IMPACTS

This section discusses the estimated costs associated with the proposed rule.

A. Labeling Requirement

The proposed regulation requires a label be placed on solid fuel, which includes manufactured logs. The manufactured log industry estimates it will cost \$1.25 million to comply with the labeling requirement given the full range of different packaging types (95 types of packaging).

Staff estimated a cost for industry compliance (further analysis is provided in socioeconomic analysis in the Appendix of this report) requiring just the Individual logs to be labeled. Since just the individual logs need to be labeled, and not the carton, staff subtracted the cost for adding a label to the carton. This distinction drops the industry estimate for cost of compliance by \$875,000 for the first year to \$347,500.

Industry estimated an additional 10%, or \$34,750, to account for smaller purchase amounts of labels due to geographical limitations of the labels. Staff estimated an additional cost of 15%, or \$52,125 for each year to account for this cost. This factor increased the first year cost to \$399,625 and \$660,250 for five years to comply with the labeling requirement.

Industry provided total annual sales data (but only for grocery store sales, which approximates only 45% of total sales): \$21,000,000; or \$105,000,000 for five years.

Table 8 below summaries the costs on a 1-year and 5-year time horizon based on total sales and total volume:

Description	1 year	5 year
Percent of cost to comply, total sales	1.9%	0.63%
Cost on a per unit (6 log box) basis	\$0.30	\$0.11
Cost per individually wrapped log	\$0.05	\$0.02

Table 8. Summary of estimated costs for industry compliance with labeling requirement.

B. Curtailment

The curtailment standard of the proposed regulation will prohibit the operation of a wood-burning device when air quality reaches unhealthy levels. Therefore, during these times, individuals will be required to operate another form of space heating. Because unavailability of natural gas is an exemption from this standard, the price of natural gas is used for a cost analysis.

The average PG&E customer winter natural gas usage is 60 therms per month, while the average PG&E customer summer natural gas usage is 24 therms per month. Therefore, the difference or 36 therms per month is used for winter usage for heating.

In summary, at 36 therms per month, the average daily usage (in a 30 day month) is 1.2 therms per day for heat. Therefore, at \$1.21 to \$1.44 per therm per day for 1.2 therms per day the cost to heat will be \$1.45 to \$1.72 per day of curtailment, minus the cost of solid fuel.

C. New Installations of Cleaner Burning Devices

The proposed rule will require homebuilders that install a wood-burning device chose an approved wood-burning device (EPA-Phase II certified or a pellet fueled device.) While these devices produce less emissions than a typical fireplace (a “zero clearance” or “low-mass” fireplace), they have a higher cost. However, homebuilders can install gas fueled devices, which are not affected by the proposed rule, and the installation cost of these devices will not be affected by the proposed rule. A builder choosing to install an approved device rather than a gas fueled device will have an increased cost. However, eight of the nine bay area counties have adopted the Air District’s model ordinance for wood-burning devices, which requires cleaner burning technology in new construction, subject to county building permits. Therefore, industry costs will not be impacted in these counties.

D. District Staff Impacts

Currently, the District does not regulate emissions from residential wood-burning but does respond to air pollution complaints, which are handled by air quality inspectors. In

2007 there were 78 wood smoke complaints received by the Air District; no notices of violations were issued. It is difficult to predict the number of complaints that will be received due to implementation of the rule; however, staff expects an increase in the number of complaints received after rule adoption. In addition, shift or overtime work is anticipated as the majority of wood-burning complaints occur in the evening.

Since the proposed new rule adds new standards for wood-burning devices it is anticipated that additional resources will be needed to handle the increase in inspections and investigations, process non-compliance letters and settle notices of violation, purchase moisture meters, track curtailment days and update the emission inventory, and to enhance current outreach efforts. These costs have been considered in the District's budget.

E. Incremental Costs

Under California Health and Safety Code Section 40920.6, the District is required to perform an incremental cost analysis for a proposed rule under certain circumstances. To perform this analysis, the District must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the District must "calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option."

For the proposed regulation, staff has not identified any incremental costs since the regulation does not impose any one specific control technology. EPA-certified devices are the industry standard for any new wood-burning devices.

F. Socioeconomic Impacts

A socioeconomic analysis mandated by Section 40728.5 of the Health and Safety Code was prepared by Applied Economic Development, Berkeley, California. The analysis concludes there are no secondary impacts resulting from changes in household spending habits, meaning small businesses, particularly retail and services, are not disproportionately impacted by the rule.

VI. ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act, the District's environmental consultant, Environmental Audit, Inc., has prepared a draft Environmental Impact Report (EIR) for the proposed rule to determine whether it would result in any significant environmental impacts. The draft EIR concludes that the proposed rule would not have any adverse impacts and an increase in greenhouse gas emissions is not significant. The EIR is available on the Air District's website at www.baaqmd.gov and open for public

comment until June 18, 2008.

VIII. REGULATORY IMPACTS

Section 40727.2 of the Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and district air pollution control requirements for the equipment or source type affected by the proposed change in district rules. The district must then note any differences between these existing requirements and the requirements imposed by the proposed change. Adoption of this rule would not conflict with any existing federal or Air District requirement.

IX. RULE DEVELOPMENT PROCESS

District staff has undertaken a rule development process with extensive public outreach to involve all stakeholders in developing this proposal, including solid fuel manufacturers, hearth product trade organizations and industry representatives, national and local health organizations, county health departments, wood suppliers and members of the public with an interest in wood burning. This included a series of seven workshops, nine informational meetings and ongoing outreach to interested parties and the general public.

The purpose of the rule workshops was to solicit comments from the public on the proposed Regulation 6, Rule 3. In November 2007, the Air District conducted seven rule development workshops in the following cities: Oakland, Santa Rosa, San Jose, Concord, Vallejo, Redwood City, and Livermore.

These workshops were well received and generated several common questions and comments. These may be summarized as follows:

- EPA-certified devices and pellet fueled devices should be allowed to operate during a curtailment.
- Sub-divide the Air District into smaller zones for curtailment, rather than implementing a curtailment throughout the entire District.
- The effectiveness and methodology of enforceability of the proposed regulation should be explained.
- Clarification is needed in the language for the exemption when the only source of heat is a wood-burning device.
- The notification methods for informing the public of a curtailment period should be expanded and made better known.

- Masonry heaters should be permitted as approved devices in new construction and remodels.

As a result of these comments, staff revised the rule where deemed appropriate. These changes include:

- An exemption from the curtailment standard to permit those individuals relying on wood burning as an only source of heat to burn solid fuel during a curtailment, and a provision to provide documentation explaining why the device is the only source of heat for a residence and if the situation is temporary or permanent.
- Clarification to the Administrative Requirements specifying the Air District has sole authority regarding enforcement and will independently verify any violation.
- Notification of curtailment periods will be made broadly available to the public through 1-800-HELP-AIR, www.baaqmd.gov, email updates and various media outlets.
- These devices could be allowed for new construction, either in a new structure or as part of a remodel in the District, should certain models be able to demonstrate that they can meet future, voluntary EPA approved emission targets according to EPA approved test methods for low-mass fireplaces and masonry heaters.

In April 2008, the Air District conducted nine informational meetings in the following cities: Redwood City, Napa, Santa Rosa, Vallejo, Concord, Livermore, Novato, San Jose and Oakland. The purpose of these meetings was to explain recent changes and obtain public input.

Throughout the rule development process staff presented to the following Air District committees:

- Staff is scheduled to present to Advisory Council Public Health Committee on June 9, 2008
- Stationary Source Committee meeting on May 19, 2008
- Advisory Council Public Health Committee on March 12, 2008
- Stationary Source Committee meeting on March 3, 2008
- Stationary Source Committee meeting on December 3, 2007
- Budget and Finance Committee meeting on December 12, 2007
- Stationary Source Committee meeting on September 17, 2007
- Stationary Source Committee meeting on March 8, 2007.

Staff has met with concerned and interested stakeholders including Realtor Associations,

the American Lung Association and members of the Hearth, Patio & Barbecue Association, which includes retail stores and manufacturers. Air District staff has also spoken with the Home Builders Association of Northern California and the Marin County Community Development Sustainability Team.

X. CONCLUSION

Pursuant to Section 40727 of the California Health and Safety Code, the proposed rule must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. The proposed regulation is:

- Necessary to protect public health by reducing particulate matter emissions to meet the requirements of Senate Bill 656 Particulate Matter Implementation Schedule;
- Authorized by California Health and Safety Code Sections 40000, 40001, 40702, and 40725 through 40728;
- Clear, in that the new regulation specifically delineates the affected industry, compliance options, and administrative requirements for industry subject to this rule, so that its meaning can be easily understood by the persons directly affected by it;
- Consistent with other District rules, and not in conflict with state or federal law;
- Non-duplicative of other statutes, rules, or regulations; and
- Implementing, interpreting and making specific the provisions of the California Health and Safety Code sections 40000 and 40702.

An Environmental Impact Report prepared by Environmental Audit, Inc., concludes that there will be no adverse environmental impacts from adoption of the proposed rule. A socioeconomic analysis prepared by Applied Development Economics concludes that the affected industries will be able to absorb the costs of compliance with the proposed rule without economic dislocation or loss of jobs.

District staff recommends adoption of proposed Regulation 6, Rule 3: Wood-burning Devices, approval of proposed amendments to Regulation 1 and Regulation 5, and certification of the draft Environmental Impact Report.

XI. REFERENCES

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Officer: Roy Huntley Office of Air Quality Planning and Standards
Office of Air and Radiation U. S. Environmental Protection Agency Research Triangle
Park, North Carolina 27711 Prepared by:Eastern Research Group, July 29, 1996

EPA-450/2-92-002, Technical Information Document For Residential Wood Combustion
Best Available Control Measures, September 1992

Lists of EPA Certified and Exempt Devices: <http://www.epa.gov/woodstoves/index.html>

EPA Low Mass Fireplace Program link:
<http://www.epa.gov/woodstoves/programs.html#2008workshop>

Appendix A
Peer-Reviewed Health Studies

Particulate Matter Pyramid of Effects and Pertinent Health Studies

(Note: These are only selected studies that were chosen by the Air District to exemplify the health effects of PM. Refer to the EPA listed health studies for a comprehensive listing considered for NAAQS revision.)

Lung function decrements, inflammation and permeability, susceptibility to infection, cardiac effects

Author	Journal	Factoid
Kunzli, N. et al. 2005	Environmental Health Perspectives	The study showed a 4.3% increase in carotid artery intima-media thickness (CIMT) per 10 $\mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$, which is epidemiologic evidence of an association between atherosclerosis and $\text{PM}_{2.5}$.
Gauderman, W.J. et al. 2004	New England Journal of Medicine	An eight year study of more than 1,700 children (average age, 10 years) from 12 southern California communities, found that the proportion of children with low lung function was about five times greater in the community with the highest level of $\text{PM}_{2.5}$ compared with the community with the lowest levels.

Respiratory symptoms, medication use, asthma attacks

Author	Journal	Factoid
Mar, T.F. et al. 2004	Inhalation Toxicology	Strong association was found between cough and $\text{PM}_{2.5}$ in children.
Rabinovitch, N. et al. 2006	American Journal of Respiratory and Critical Care Medicine	In a two-year study of schoolchildren with severe asthma, peak concentrations of $\text{PM}_{2.5}$ were found to be associated with increase use of asthma medication.

Doctor visits, school absences

Author	Journal	Factoid
Ransom, M.R. and Pope, C.A. III 1992	Environmental Research	A study of kindergarten children found that a 100 $\mu\text{g}/\text{m}^3$ increase in the 28-day moving average of PM_{10} was associated with a 40% increase in overall school absences. This association was observed even at PM_{10} levels below 150 $\mu\text{g}/\text{m}^3$.

ER visits, hospital admissions

Author	Journal	Factoid
Dominici, F. et al. 2006	Journal of the American Medical Association	A study of 11.5 million Medicare participants found 1.28% increase in hospital admission rate for heart failure per 10 $\mu\text{g}/\text{m}^3$ increase in same-day $\text{PM}_{2.5}$. Short-term exposure to $\text{PM}_{2.5}$ increases the risk for hospital admission for cardiovascular and respiratory diseases.
Metzger, K.B. et al. 2004	Epidemiology	Cardiovascular disease emergency department visits were associated with $\text{PM}_{2.5}$. Associations were strongest with same-day $\text{PM}_{2.5}$ levels.

Death

Author	Journal	Factoid
Chen, L. H. et al. 2005	Environmental Health Perspectives	In females, the relative risk for fatal coronary heart disease (CHD) with each 10 $\mu\text{g}/\text{m}^3$ increase in $\text{PM}_{2.5}$ was 1.42. Those exposed to levels greater than 38 $\mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$ were 2.3 times more likely to die of CHD than those living in areas where concentrations were less than or equal to 25 $\mu\text{g}/\text{m}^3$.
Pope, C.A. et al. 2002	Journal of the American Medical Association	A study of approximately 1.2 million adults found a 6% and 8% increased risk of cardiopulmonary and lung cancer mortality, respectively, for each 10 $\mu\text{g}/\text{m}^3$ elevation in long-term average $\text{PM}_{2.5}$ ambient air concentration.
Pope, C.A. et al. 2004	Circulation	Statistically robust associations between $\text{PM}_{2.5}$ and overall cardiovascular disease mortality were observed. Fine particulate air pollution is a risk factor for cardiovascular disease mortality.

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Appendix B
List of EPA Certified and Exempt Devices



List of EPA Exempt Wood Heating Appliances



EPA Wood Heater Program

The United States Environmental Protection Agency (EPA) regulates particulate emissions from wood heating appliances as part of the Clean Air Act's New Source Performance Standard for Residential Wood Heating Appliances at 40 CFR Part 60, Subpart AAA. Wood heating appliances subject to this regulation must have a firebox volume less than 20 cubic feet, weigh less than 800 kilograms, possess a burn rate less than 5 grams per hour and have an air to fuel ratio less than 35 to 1. The wood stove regulations apply to wood heating appliances intended for residential heating. Appliances such as cookstoves, wood burning furnaces, outdoor wood boilers, coal stoves and fireplaces are not subject to these regulations.

The following is a list of wood heating appliances that have been formally exempted from the EPA wood stove program. The manufacturers of these appliances demonstrated that they do not meet the criteria necessary for EPA wood stove certification by submitting test reports and engineering drawings to the EPA. Please note, the appliances on this list are not EPA certified wood stoves and therefore may not be legal for sale or installation in some jurisdictions in the United States.

Please contact John DuPree at 202-564-5950 should you have questions regarding the EPA Wood Heater Program or EPA certified wood stoves.



EXEMPT APPLIANCES

8/13/07

Manufacturer

Model Name

Basis for Exemption

Alpha Energy Designs

815 D Street
Lewiston ID 83501
USA
208-746-5502

Alpha A20 Fireplace Insert

Burn Rate > 5kg/hr

Alternative Energy Northwest, Incorporated

16311 Smokey Point Blvd
Arlington WA 98223
USA
206-652-8124

2001 Pellet Stove

Air-to-Fuel Ratio > 35:1

American Energy Systems R.D.M.

50 Academy Lane
Hutchinson MN 55350
USA
612-587-6565

Magnum ZC

Burn rate > 5 kg/hr

American Road Equipment Company

4201 North 26th Street
Omaha NE 68111
USA
402-451-2575

Erik Jr. Elite M

Air-to-Fuel Ratio > 35:1

Andersen Mfg., Inc.

3125 N. Yellowstone
Box 434D
Idaho Falls ID 83401
USA
(208) 523-6460

Elco Fireplace

Burn Rate > 5 kg/hr

Aqua II Manufacturing

2421 west Clemmons ville road
Winston Salem NC 27127
USA
(919)768-4800

Aqua II Water Stove

Qualifies as Furnace

Manufacturer
Model Name

Basis for Exemption

Aqua-Therm

Route 1, Box 1
Brooten MN 56316
,
USA
612-346-2264

Aqua-Therm 145, 275, 345

Qualifies as Boiler

Ardisam

1690 Elm Street
Cumberland WI 54829
,

MF3500

Qualifies as a Furnace.

Biofire, Inc.

3220 Melbourne
Salt Lake City UT 84106
,
USA
801-486-0266

3x3, 4x3, 4x4, 5x3

Weight > 800 Kg

Century Manufacturing Company, Inc.

1620 East 20th Street
P.O. Box 1744
Joplin MO 64801
USA
(417) 624-1480

CO-28-WG

Burn Rate > 5 Kg/hr

CO-36 Fireplace Furnace

Burn Rate > 5 Kg/hr

CFM Corporation (Vermont Castings, Inc.)

Route 107, Box 501
Bethel VT 05032
,
USA
(802) 234-2300

Dauntless Fireplace

Burn Rate > 5 Kg/hr

Cool Country Enterprises

P.O. Box 786
41508 Maycreek Road
Gold Bar WA 98251
USA
360-793-2110

Earth Friendly P.S.

Air-to-fuel ratio > 35:1.

Manufacturer
Model Name

Basis for Exemption

Country Flame Technologies, Inc.

900 George Street
Marshfield MO 65706

USA
417-466-7161

NPS-1000

Air-to-fuel Ratio > 35:1

Country Stoves, Inc.

PS 40 & PI 40

Air to Fuel Ratio

Dovre, Inc.

401 Hankes Avenue
Aurora IL 60505

USA
(312) 844-3353

Focus II, Model FOC2

Sunburst II 2100

Qualifies as Coal Stove

Burn Rate > 5 kg/hr

Dumont Refrigeration Corp.

P.O. Box 148
Monmouth ME 04259

USA
207-933-4811

Temptest 150, 350

Qualifies as Boiler

Earthstone

2733 Mariquinta Street
Suite 101
Long Beach CA 90803
USA

310-434-7095

Earthstone Wood Burning Ovens 60, 90, 130

Wood-fired ovens

ECOHEAT of Canada Inc.

P.O. Box 93110, 1450 Headon Road
Burlington, Ontario L7M 4A3

Canada
905-331-2702

Ecoheat Cookstove

Manufacturer
Model Name

Basis for Exemption

Energy Equipment and Manufacturing Company

615 South 32nd Avenue
Yakima WA 98902

USA
509-457-1108

Energy Hearth Fireplace Furnace

Burn Rate > 5 Kg/hr

England's Stove Works, Inc.

589 S. Five Forks Road
Monroe VA 24574

USA
(804) 929-0120

Model 25-PDV and 55-SHP22

Air-To-Fuel ratio > 35:1

Models 25-PDVC and 55-SHP10

Air-to-Fuel-Ratio > 35:1

Models 25-PDVC and 55-SHP10

Air-to-Fuel-Ratio > 35:1

GEMSTAR Fireplace Co., Ltd.

6265 19th Street
Surrey, B.C. V3S 5M8

Canada
604-530-9060

GEMSTAR

Air-to-Fuel Ratio > 35:1

Gibraltar Stoves, Inc.

512 - 72nd Street
Holmes Beach FL 34217

USA
813-779-2217

LCC, MCC, SCC, CFS, CFI & DDI

Classified as Coal Stove

Hardy Manufacturing Co., Inc.

Route 4, Box 156
Philadelphia MS 39350

USA
601-656-5866

Hardy, Hardy Jr.

Qualifies as Boiler

Hearth and Home Technologies

1445 North Highway
Colville WA 99114

USA
509-684-3745

Quadrafire 1000 Pellet Stove

Burn Rate > 5 Kg/hr.

Quadrafire 1000 Pellet Stove

Air-to-Fuel ratio > 35-to-1

Manufacturer
Model Name

Basis for Exemption

Hearth & Home Technologies

PEL-30 Contour

Air-to-Fuel Ratio > 35

Heartland Appliances, Inc.

1050 Fountain Street North
Cambridge Ontario N3H 4R7
Canada
(519)743-8111

A-19-3 Oval Woodburning

Cookstove

A263 Sweetheart

Cookstove

Artisan

Cookstove

Heating Energy Systems, Inc.

P.O. Box 593
14300 SE Industrial Way
Clackamas' OR 97015
USA
503-786-4004

Trailblazer Classic 1600PS

Air-To-Fuel Ratio > 35:1

Heatmor Outdoor Wood Burning Furnaces

Highway 11 East, Box 787
Warroad, MN 56763
USA
218-386-2769

100CSS, 175SSE, 200CSS, 400CSS and 400DCSS

Qualifies as Furnace.

Hicks Waterstoves & Solar System

2541 South Main Street
Mt. Airy NC 27030
USA
919-789-4977

500, 700, 1000 gallon waterstoves

Qualifies as Boiler

High Energy Manufacturing

PO Box 400
Vermillion Bay, Ontario 54829
Canada POV 2VO

J2000

Qualifies as a Furnace.

Manufacturer
Model Name

Basis for Exemption

Jensen Metal Products, Inc.

7800 Northwestern Avenue
Racine WI 53406

USA
(414)886-9318

Models 24A,24AC,30A & 30AC

Qualifies as Furnace

Ka-Heat Kachelofen, Ltd.

R.R. NO4, 670 Packer Road
Roseneath, Ontario K0K 2X0

Canada
905-352-3848

FK07 and FK09

Burn rate > 5 kg/hr

Klass Waterstove

4931 Elkorn Ct.
Salem OR 97301

USA
503-391-2880

Klass Waterstove

Qualifies as Furnace

L.B. Brunk & Sons, Inc.

10460 S.R. 45N
Salem OH 44460

USA
(216) 332-4297

120, 150, 190

Qualifies as Furnace

Lamppa Manufacturing & Distributing Co., Inc.

P. O. Box 422
Tower MN 55790

USA
218-753-2330

Kuuma Wood Sauna Stove

Air-To-Fuel Ratio > 35:1

Lennox Hearth Products

1110 West Taft Ave.
Orange CA 92865

USA
714-921-6100

Whitfield Profile 20 / Optima 20

Air-to-Fuel ratio < 35:1

Whitfield Profile 30 / Optima 3

Qualified for exemption.

Whitfield Renaissance WW 1 Pellet Stove

Air-To-Fuel Ratio > 35:1

Manufacturer
Model Name

Basis for Exemption

Majco Building Specialties, L.P.

1000 East Market Street
P.O. Box 800
Huntington, IN 46750
USA
(219) 356-8000

Majestic BFC 36
Model FC-36

Burn rate > 5 kg/hr.
Burn rate > 5kg/hr.

National Steelcrafters of Oregon

P.O. Box 2501
Eugene, OR 97402
USA
(503) 683-3210

P24FS and P24I
P2700FSA

Air-to-Fuel Ratio > 35:1
Air-to-Fuel Ratio > 35:1

Nature's Furnace, Inc.

3338 Ute Avenue
Waukee, IA 50263
USA
515-987-2397

Biomass Reactor

Qualifies as Furnace.

NHC Inc.

317 Stafford Avenue
Morrisville, VT 05661
USA
802-888-5232

L07
Model American Heritage Wood Burning Stove
Model Hearthstone 1

Cookstove
Burn Rate > 5 Kg/hr
Burn Rate > 5 Kg/hr

Rais A/S

23 Hack Green Road
Pound Ridge, NY 10576
USA
(914) 764-5679

Rais #2,#3,#4,#86,#101,#106,#115

Cookstove

Manufacturer
Model Name

Basis for Exemption

Reed Metal Works, Inc.

HC2, Box 656
Warroad MN 56763
USA
218-386-2769

JR Heatmor Model 200CSS and 400CSS

Qualifies as Furnace.

Reliant Industries, Inc.

333 Industrial Dr. #3
Placerville CA 95667-6849
USA
916-622-5887

Essex

Reliant Tempest Pellet Stove

Air-to-Fuel Ratio > 35:1

Air-To-Fuel > 35:1.

Riteway-Dominion Manufacturing Company, Inc.

1680 Country Club Road
Box 5
Harrisonburg VA 22801
USA
(703) 434-3800

Omni I, Omni II

Qualifies as Furnace.

RJM Manufacturing, Inc.

Route 5, Box 190
Chippewa Falls WI 54729
USA
715-723-9667

Energy King Furnace 120, 145, 185

Qualifies as Furnace

Royal Crown European Fireplaces, Inc.

333 East State, Suite 206
Rockford, IL 61104
USA
815-968-2022

100-0, 100-2, 200-0, 200-3, 202-1, 202-4, 206-0

Weight > 800 Kg

RSF Energy Ltd.

801 St Nicholas
St Jerome QC J7Y 4C7
Canada
450-565-6336

Omega

Opel 2000E

Oracle

Burn Rate > 5 Kg/hr

Burn rate > 5 Kg/hr

Burn Rate > 5 Kg/hr

Manufacturer
Model Name

Basis for Exemption

Scott Stoves, Inc.

**P.O. Box 1033
Hayden Lake ID 83835
USA
208-772-7310**

Pellet Stove Model 1

Air-to-Fuel Ratio > 35:1

Sherwood Industries, Ltd.

**6782 Oldfield Road
Saanichton BC V8M 2A3
Canada
604-652-6080**

EF 3, Meridian and VF 100

Air to Fuel Ratio

Empress/Windsor

Air to Fuel Ratio

Vista Flame Envirofire EF II

Air to Fuel Ratio

Vista Flame Envirofire Evolution Model EF 5/VF 5

Air to Fuel Ratio

Vista Flame Envirofire Pellet Stove

Air to Fuel Ratio

Snorkel Stove Company

**108 Elliott Avenue West
Post Office Box 20068
Seattle WA 98102
USA
206-283-5701**

Snorkel, Scuba Hot Tub Heater

Hot Tub Heater

Stove Builder International Inc.

**1700 Leonharmel Street
Quebec City Quebec G1N 4R9
Canada
418-527-3060**

Series EE1200 Acorn

Minimum burn rate greater than

Suburban Manufacturing Company

**P.O. Box 399
676 Broadway Street
Dayton TN 37321
USA
(615) 775-2131**

Coalchief CC6-88

Coal Stove

Coalmaster C6-88

Coal Stove

Woodchief FP6-88U & FP6-88WCU

Burn Rate > 5.0 kg/hr

Manufacturer
Model Name

Basis for Exemption

Taylor Products, Inc.

P.O. Box 518
Elizabethtown, NC 28337
USA
(919) 862-2576

Taylor Outside Wood Fired Hot Water Furnace

Qualifies as Furnace.

The Maxson Company/Acucraft Fireplace Systems

Z-Max

Burn Rate > 5 Kg/hr

The New Alberene Stone Company

P.O. Box 300
Schuyler, VA 22969
USA
804-831-2228

H 950, HPU 950

Weight > 800 Kg

HU 2850, HU 3750

Weight > 800 Kg

KTU 1650, KTU 1650L, KTU 1900L

Weight > 800 Kg

LLU 1150 1H, LLU 1150 2H, LU 2150, HU 3750, LU2750

Weight > 800 Kg

LU 1900, KTLU 1800L, TLU 2700L, TLU 2800L, TLU3300

Weight > 800 Kg

P&M 1450, P&M 1500, P&M 2050

Weight > 800 Kg

SKU 850

Weight > 800 Kg

TU 1100

Weight > 800 Kg

TU 1400, TU 1400L

Weight > 800 Kg

TU 1700, TU 1800, TU 1800 L

Weight > 800 Kg

TU 800, TU 1025, TU 1250

Weight > 800 Kg

Thelin Company Inc.

P.O. Box 847
Nevada City, NV 95959
USA
(916) 273-1976

Echo

Air-to-Fuel Ratio > 35:1

Focus II, FOC2

Coal Stove

Thompson, Design E

Air-to-Fuel Ratio > 35:1

Turbo-Burn, Inc.

4225 E Joseph
Spokane, WA 99207
USA
(509) 487-3609

TB-1 & TB-2

Qualifies as Furnace.

Manufacturer
Model Name

Basis for Exemption

U.S. Stove Company

227 Industrial Park Drive
South Pittsburg TN 37380

USA
(615) 837-2100

Logwood 2421

Burn Rate > 5 Kg/hr

Model 1261

Burn Rate > 5 kg/hr

MODEL 127

Burn rate > 5 kg/hr

MODEL 4300

Burn Rate > 5 Kg/hr

Paragon 5440

Air-To-Fuel Ratio > 35:1

Tri-Star 5448-Q

Air-To-Fuel Ratio > 35:1

Unique Functional Products

135 Sunshine Lane
San Marcos CA 92069

USA
(619) 744-1610

UFP Free Heat Machine

Fireplace Accessory

Vogelzang International Incorporated

400 West 17th Street
Holland MI 49423

USA
(616) 396-1911

BK50E, BK100E, BK150E

Burn Rate > 5.0kg/hr

BX42E, FS260E, HH005, P205E, PB65XL, SR57E

Burn Rate > 5.0kg/hr

VG450ELG, VG450EL, VG450ELGB, VG650ELGB, VG810CL

Burn Rate > 5.0kg/hr

Waterford Stanley Limited

Bilberry, Waterford

Ireland
011-353-51-302300

The Stanley Cookstove

Qualifies as Cookstove

Wolf Steel Limited

24 Napoleon Road
Barrie Ontario Canada
Canada L4M 4Y8

NPS 40

Qualifies as a Furnace.

NZ6000

Qualifies as a Furnace.

Manufacturer
Model Name

Basis for Exemption

Wood-aire

**P.O. Box 296
Commerce OK 74339
Canada
918-675-4355**

3225 Fireplace Furnace

Burn Rate > 5 Kg/hr

N.B.: This list only shows those appliances for which manufacturers have requested and been granted exemption by EPA. Other appliances may exist which are exempt but for which EPA has not made a determination. EPA does not require manufacturers of exempt appliances to demonstrate that their products are exempt. However, to appear on this list, a manufacturer must submit documentation or test data from an accredited testing laboratory.

Other States and localities may have other exempt appliance policies which differ from EPA's policy.

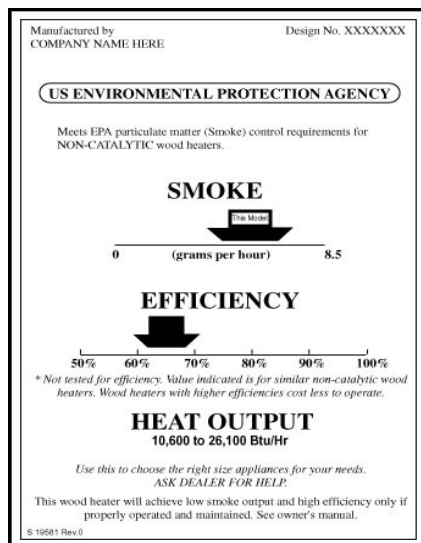


List of EPA Certified Wood Stoves March 12, 2008



EPA Wood Heater Program

Enclosed is the list of wood stoves certified by the United States Environmental Protection Agency. An EPA certified wood stove or wood heating appliance has been independently tested by an accredited laboratory to meet a particulate emissions limit of 7.5* grams per hour for noncatalytic wood stoves and 4.1* grams per hour for catalytic wood stoves. All wood heating appliances subject to the New Source Performance Standard for Residential Wood Heaters under the Clean Air Act offered for sale in the United States are required to meet these emission limits. An EPA certified wood stove can be identified by a temporary paper label attached to front of the wood stove and a permanent metal label affixed to the back or side of the wood stove (See examples below). Please contact John DuPree at 202-564-5950 should you have questions regarding a particular model line or manufacturer.



*

Temporary Wood Stove Label



Permanent Wood Stove Label

Wood stoves offered for sale in the state of Washington must meet a particulate emissions limit of 4.5 grams per hour for non catalytic wood stoves and 2.5 grams per hour for catalytic wood stoves.



Certified Wood Heaters

Manufacturer	Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
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Aladdin Hearth Products

1445 North Highway
Colville WA99114 ,
USA
509-684-3745

<http://www.aladdinhearth.com/>

Sunburst II Model 2208

Noncatalytic	4.4	63 %	11500-36300
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American Road Equipment Company

4201 North 26th Street
Omaha NE68111 ,
USA
402-451-2575

Erik SW II Catalytic Environmentalist SSW-1000

Catalytic	1.2	72 %	9800-46900
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Amesti LTDA

Jose Miguel Carrera N 6
Santiago Chile ,

Rondo 450

Noncatalytic	4.0	63 %	11,842-24,288
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Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Appalachian Stove & Fabricators, Inc.

329 Emma Road

Asheville NC28806 ,

USA

(828) 253-0164

<http://www.appalachianstove.com/>

28 CD

Catalytic

4.5

72 %

9500-16300

32-BW-XL-88, Gemini-XLB 1989

Catalytic

4.0

72 %

8400-19800

36-BW-1988

Catalytic

3.9

72 %

9500-19300

Heritage Classic A, T16, Cast heat & Catskill

Noncatalytic

4.4

63 %

10,300-31,200

Heritage Classic;

Noncatalytic

6.8

63 %

11057-31327

Model 30-CD

Catalytic

3.7

72 %

8500-21400

Model 32-BW

Catalytic

2.5

72 %

10400-24500

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Model 36 BW	Catalytic	3.3	72 %	10600-30200
Model 360-CR	Catalytic	2.8	72 %	10600-29100
Model 52 WXL 1988	Catalytic	4.2	72 %	10500-15400
Trailmaster 4N1-XL	Catalytic	4.7	72 %	9600-19600
Trailmaster Model 4N1-XL II	Catalytic	3.4	72 %	10100-26900
Archgard Industries, Ltd.				
7116 Beatty Dr.				
Mission	BCV2V6B4			
Canada				
604-820-8262				
http://www.archgard.com/				
Chalet 1600 and Chalet 1600 Insert	Noncatalytic	2.9	63 %	10,611-29,181
Chalet 1800	Noncatalytic	3.6	63 %	10,700-35,500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Optima PS1

Noncatalytic

0.9

63 %

10,196-29,581

Austroflamm Industries Inc.

1007 International Drive

Oakdale PA15071-922 ,
USA

724-695-2430

<http://www.austroflamm.com/>

Esprit Wood 119.1

Noncatalytic

6.3

63 %

11400-43600

Integra C1121

Pellet

2.7

78 %

9300-31100

Irony M

Pellet

6.6

63 %

11800-46800

Barbeques Galore/Pricotech

45 Princes Road West

Auburn 02144 ,
Australia

+61 363811322

<http://www.tasmaniacentral.tas.gov.au/saxon/>

Rosewood

Noncatalytic

2.7

63 %

11600-36200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Blaze King Industries, Inc.

146 A Street

Walla Walla WA99362 ,

USA

509-522-2730

<http://www.blazeking.com/>

Blaze King, Auto Light PAL-4000

Pellet

2.5

78 %

12200-33700

Blaze King KEJ 1107

Catalytic

1.8

72 %

9100-39800

Blaze King KEJ-1102

Catalytic

3.9

72 %

7900-42600

Blaze King, King Catalytic Insert KEI-1300

Catalytic

2.2

72 %

10100-34500

Blaze King, King Catalytic KEJ-1101

Catalytic

1.9

72 %

9000-35300

Blaze King PEJ 1003

Catalytic

3.5

72 %

10300-41600

Blaze King, Princess Catalytic PEJ-1002

Catalytic

3.7

72 %

8400-35400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Blaze King Princess Insert Model PI 1010	Catalytic	2.8	72 %	9,300-31,200
Blaze King, Royal Guardian RGT-3001	Noncatalytic	5.8	63 %	9400-39800
Blaze King, Royal Heir RHT-2100	Catalytic	3.0	72 %	6800-57100
Blaze King, Royal Heir RHT-2200, 2250	Catalytic	2.5	72 %	7700-31100
Briarwood II/90	Noncatalytic	3.5	63 %	10600-36000
Eagle/Pioneer E90, PZ-90, Briarwood XE-90, XEI-90	Noncatalytic	5.2	63 %	13500-38000
Heat Pro C110	Catalytic	2.8	72 %	9600-32400
Heat Pro C210	Catalytic	2.1	72 %	10700-43300
Princess Insert Model PI 1010A	Catalytic	2.0	72 %	7,200-29,500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Princess PEJ 1006

Catalytic

2.4

72 %

12000-35600

Ceramiche Savio di Elio & C. s.n.c.

10010 Torre Canavese ,
Italy

<http://www.ceramichesavio.it/uk/default.htm>

Catellante di Castellante and Real Castillo di Ague Model CS1

Noncatalytic

5.1

63 %

11200-40800

Real Castello di Moncaueri/Castllo Della Venaria

Noncatalytic

5.6

63 %

10100-24200

CFM Corporation

Route 107, P.O. Box 501
Bethel VT05032 ,
USA
802-234-2300

<http://www.cfmcorp.com/>

Aspen 1920 & Plymouth HWS10

Noncatalytic

4.3

63 %

9100-18000

CW2500X00, CW2500X02, JW2500X00, CJW2500X02, DW2500 and JW2500X10

Noncatalytic

4.7

63 %

9500-57800

DutchWest Large 2479

Noncatalytic

1.3

63 %

11,300-26,500

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
DutchWest Medium 2478	Noncatalytic	1.5	63 %	10,600-25,300
DutchWest Small Model	Noncatalytic	1.4	63 %	7,800-25,100
EWF 30	Noncatalytic	3.5	63 %	11,100-40,500
FW247001 to FE247004 and JW1000PF1	Noncatalytic	5.0	63 %	11500-18900
Model EWF 36A	Catalytic	2.4	72 %	11,300-75,500
Vermont Castings Defiant 1610	Noncatalytic	2.9	63 %	10,000-30,000

CFM Corporation (Jacuzzi Leisure Products, Inc.)
Route 107, P.O. Box 501
Bethel VT05032 ,
USA
802-234-2300

Campbell/Jacuzzi FW300005-FW300008 & FW300019-FW300027,
Noncatalytic 4.4 63 % 12000-55100

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

S27X/S28X & FW27 Series, CJW1500L02, JW1500L10 and JW1500P10, FW1500, DW1500

Noncatalytic 4.4 63 % 10300-29200

CFM Corporation (Vermont Castings, Inc.)

Route 107, Box 501

Bethel VT05032 ,
USA

(802) 234-2300

<http://www.vermontcastings.com/>

2370

Catalytic 1.0 72 % 5700-18300

2370

Noncatalytic 3.0 72 % 10,094-27,550

Aspen Model 1920

Noncatalytic 6.3 63 % 10100-26400

C.D. Adirondack Wood Heater FA267CL

Catalytic 3.7 72 % 8400-40000

C.D. Extra-Lg. Federal Convection Heater FA288CCL

Catalytic 2.6 72 % 8400-38700

C.D. Federal "A Plus" FA224ACL

Catalytic 3.5 72 % 7200-30000

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
C.D. Large Federal Box Heater FA209CL	Catalytic	4.3	72 %	9000-25600
C.D. Lg. Fed. Convection Heater FA264CCL, FA264CCR	Catalytic	1.6	72 %	6600-26700
C.D. Rocky Mountain Heater FA211CL	Catalytic	2.9	72 %	6800-27800
C.D. Sequoia FA455	Catalytic	3.6	72 %	8700-60300
C.D. Small Federal Box Heater FA207CL	Catalytic	4.3	72 %	6200-28000
C.D. Small Federal Convection Heater FA224CCL	Catalytic	2.8	72 %	7000-30600
Century/Dutchmaster FW and CDW	Noncatalytic	1.0	63 %	11,800-32,300
Defiant 1610	Noncatalytic	0.0	0 %	
Defiant 1910 & 1945	Catalytic	0.8	72 %	10600-44400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Defiant Encore	Catalytic	0.6	72 %	6200-32900
Defiant Encore 2140	Catalytic	1.8	72 %	9000-41300
Defiant Encore 2550 (Formerly 2190)	Catalytic	1.6	72 %	8700-41700
Dutchwest Extra Large Convection 2462	Catalytic	1.3	72 %	8300-28000
Dutchwest Large Convection Heater (Model 2461)	Catalytic	1.4	72 %	10700-29500
Dutchwest Small Convection Heater #2460	Catalytic	1.1	72 %	6600-27300
Encore 1450 N/C	Noncatalytic	0.7	63 %	10,600-24050
EWf36		2.7	72 %	11,800-68,600
FA224	Catalytic	3.1	72 %	9100-34800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
FA264	Catalytic	2.2	72 %	9500-31700
FA288	Catalytic	3.1	72 %	7800-29300
FA455	Catalytic	1.3	72 %	10400-26500
Intrepid II 1308	Catalytic	3.1	72 %	10200-22500
Intrepid II Model 1990	Catalytic	2.1	72 %	8300-26700
Intrepid II Model 2070	Catalytic	2.4	72 %	9200-19300
Intrepid Model 1640	Noncatalytic	3.3	63 %	8200-19500
Madison 1650	Noncatalytic	5.5	63 %	11400-31000
Model 2170	Catalytic	2.1	72 %	9400-22800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Resolute Acclaim 0041	Catalytic	5.1	72 %	8700-30900
Resolute Acclaim (Model Number 2490) & TLWS1	Noncatalytic	3.4	63 %	9500-33900
Seville 1630	Noncatalytic	6.3	63 %	12000-27300
Seville 1635 and 1600 Insert	Noncatalytic	4.5	63 %	9,900-30,800
Seville Insert	Noncatalytic	5.5	63 %	10200-27400
WinterWarm Fireplace Insert Model 1280	Catalytic	2.1	72 %	10300-30000
WinterWarm Small Insert Model 2080	Catalytic	2.1	72 %	8700-31100
WinterWarm Small Insert (model 2370)	Catalytic	4.0	72 %	9250-21500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Consuming Fire, Inc.

12033 Mariposa Road

Wrightwood CA92345 ,

USA

760-949-2077

Perfect Hearth

Noncatalytic

3.4

63 %

11,700-38,100

Country Flame Technologies, Inc.

900 George Street

Marshfield MO65706 ,

USA

417-466-7161

<http://www.countryflame.com/>

B-6, B-I

Catalytic

4.6

72 %

9600-48200

B/A

Catalytic

2.0

72 %

10400-55500

BBF

Catalytic

3.0

72 %

10500-51400

BBF-6, BBF-I

Catalytic

3.0

72 %

9500-48600

Combo Air

Noncatalytic

7.0

63 %

9300-46400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
E-1/90	Catalytic	1.7	72 %	9600-37800
E-2	Catalytic	3.3	72 %	13000-34400
E1-6, E1-I	Catalytic	3.7	72 %	12400-55300
Inglenook INGW-02	Noncatalytic	4.4	63 %	11,600-38,000
NC-6D	Noncatalytic	4.7	63 %	11700-54900
O-2	Catalytic	2.5	72 %	8000-30000
O-2/90	Catalytic	3.0	72 %	10800-34100
OV-21	Noncatalytic	4.2	63 %	11700-42200
OV-2100	Noncatalytic	4.1	63 %	11700-32700

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
OV-2600	Noncatalytic	3.5	63 %	11500-33600
OV-26BF-I	Noncatalytic	3.7	63 %	11400-41300
OV-3000	Noncatalytic	2.9	63 %	11800-34000
Patriot	Noncatalytic	6.9	63 %	11300-34000
R-6	Catalytic	3.3	72 %	13800-50700
R/90	Catalytic	1.5	72 %	10600-46800
S-6, S-I	Catalytic	6.5	72 %	13100-48900
SBF/A	Catalytic	3.6	72 %	8700-33600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Country Stoves, Inc.

1502 14th Street NW

Auburn WA98071 ,

USA

253-735-1100

<http://www.countrystoves.com/>

Alpine

Noncatalytic

3.5

63 %

11,455-42,445

C-240 and E-240

Noncatalytic

5.1

63 %

11500-36700

Canyon C310/ST310, Elite E310

Noncatalytic

3.5

63 %

11600-38800

Canyon S310, T-Top Model S310

Noncatalytic

3.2

63 %

11400-34900

Converter C-30, C-35

Catalytic

4.0

72 %

8000-49200

Legacy S260, T-TOP S260, CONVERTER C260, and ELITE E260

Noncatalytic

4.1

63 %

11800-48000

Performer C-210, SS210, SA210 and ST210

Noncatalytic

4.2

63 %

9500-36100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Performer S180, C180, E180	Noncatalytic	6.6	63 %	11400-38700
PS 40 & PI 40	Pellet	1.1	63 %	7,476-21,343
Starlite C-20, C-21	Noncatalytic	9.6	63 %	7700-43500
Starlite C-20, C-21	Noncatalytic	9.6	63 %	7700-43500
Striker Model S 160/C 160	Noncatalytic	1.6	63 %	12500-41200
STRIKER S130, C-50L, C130, CA-50, CA-50L, CA-55	Noncatalytic	5.6	63 %	9300-43600
T-Top C-40, C-45, C-46	Noncatalytic	5.7	63 %	10700-40900
T-TOP S 240	Noncatalytic	4.9	63 %	11300-42700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

CRD Precision Fabricators Inc. (Chippewa)

Route 5, Box 190

Chippewa Falls WI54729 ,

USA

715-723-9667

Energy King Legacy 1600

Noncatalytic

7.0

63 %

11700-23100

Energy King Legacy 1650

Noncatalytic

3.7

63 %

11400-41300

Energy King Legacy 2100

Noncatalytic

3.2

63 %

11000-31100

Energy King Legacy 2150

Noncatalytic

2.9

63 %

11800-34000

Energy King Legacy 900

Noncatalytic

6.5

63 %

10200-30800

Energy King Legacy 950

Noncatalytic

4.2

63 %

11700-42200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Dell Point Technologies

3 Rue Montmartre

Blainville Quebec J7C 2Z6 ,

Canada

514-331-6212

<http://www.pelletstove.com/>

DC 2000, Europa

Pellet

0.6

78 %

10400-24100

Derco, Inc./Grizzly Stoves

10005 East U.S. 223

P.O. Box 9

Blissfield MI49228 ,

USA

Little Blazer FP-20

Catalytic

4.7

72 %

7200-28400

Little Blazer FP-20

Catalytic

4.7

72 %

7200-28400

Super Achiever FPI-2-LEX

Catalytic

2.4

72 %

9800-34200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Deville

Charleville ,
France

<http://www.flamme-bleue.com/english.php>

Deville 7794 - Comfort

Noncatalytic 6.9 63 % 11,300-35,100

Dovre, Inc.

401 Hankes Avenue
Aurora IL60505 ,
USA
(312) 844-3353

<http://www.aladdinhearth.com/>

Heirloom 300 HC

Catalytic 4.5 72 % 11600-45100

Horizon 500 CC

Catalytic 2.9 72 % 10300-33800

Horizon 500 CC

Catalytic 3.6 72 % 8300-28000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Dovre, Incorporated

1445 North Highway

Colville WA99114 ,

USA

509-684-3745

<http://www.aladdinhearth.com/>

Heirloom 390

Catalytic

2.8

72 %

9100-31800

Empire Products, Inc.

5061 Brooks Street

Montclair CA91763 ,

USA

909-399-3355

<http://www.empireproductsinc.com/>

EF-2100

Noncatalytic

5.7

63 %

11,000-42,900

Sweet Home AFX-HT, AFI-HT

Noncatalytic

6.4

63 %

11300-28200

England's Stove Works, Inc.

589 S. Five Forks Road

Monroe VA24574 ,

USA

(804) 929-0120

<http://www.englishstoves.com/>

10-CPM, 49-TRCPM, 49-SHCPM

Pellet

1.6

78 %

10,455-24,566

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
13-NCMH, 50-SNC13,	Noncatalytic	2.4	63 %	11,579-32,017
22 PIC	Catalytic	5.1	72 %	9000-30200
24 ACD	Catalytic	2.7	72 %	9000-20100
30-NC, 50-TNC30L, 50-TNC30G	Noncatalytic	1.6	63 %	11,950-28,337
Englander 13-NC Summers Heat, 50-snc Golden Eagle and 50-TNC Timber Ridge	13-NCI/50-TNC131 Noncatalytic	2.6	63 %	10,000-29,200
Englander 25-PDV, Summers Heat 55SHP22, and Timber Ridge 55TRP22 Pellet	Pellet	2.6	78 %	10,700-24,500
Englander Econo Radiant 18PC	Catalytic	3.6	72 %	8500-31000
Englander Fireplace Insert 28JC	Catalytic	4.4	72 %	8400-29100
Englander Freestanding Radiant 24FC	Catalytic	2.4	72 %	7200-35600

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Englander Front Loading Fireplace 28IC	Catalytic	2.5	72 %	8200-24400
Englander Front Loading Space Saver 28CC	Catalytic	2.7	72 %	7900-25500
Model 18 PC	Catalytic	2.2	72 %	8700-26400
Model 18M-H	Catalytic	2.0	72 %	7800-26900
Model 24IC	Catalytic	2.6	72 %	10200-27100
Pellet Fuel Burning Room Heater	Noncatalytic	3.1	78 %	8200-22400
Summers Heat Model 50-SHW20	Catalytic	2.1	72 %	7200-28600
Summers Heat Model 50-SHW22	Catalytic	3.8	72 %	9100-25400
Summers Heat Model 50-SHW25	Catalytic	2.4	72 %	5400-17400

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Eureka Heating PTY Limited

459 Dorset Road
Bayswater Victoria 3153 ,
Australia
01161397291422

<http://www.eureka-heating.com/>

Emerald

Noncatalytic

4.4

63 %

11000-35500

Evergreen Marketing, Inc.

Suite 310
8196 SW Hall Boulevard
Beaverton OR97229 ,
USA
503-598-7667

Mohawk 60A

Catalytic

3.8

72 %

4700-14300

Evergreen Metal Products Inc.

910 Sleater-Kinney Road S.E.
Suite 202
Lacey WA98503 ,
USA
206-459-0445

Schrader Pelletmiser 905-P

Pellet

1.0

78 %

11000-32700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

F. Huemer Ges. M.B.H.

A-4631 Krenglbach

Schmieding 25 ,

Austria

Austroflamm Wega II

Pellet

1.3

78 %

8500-42000

Fireplace Products International Limited

6988 Venture Street

Delta BCV4G 1H4 ,

Canada

604-946-5155

<http://www.regency-fire.com/>

F1100S, I1100S I1200S , HI200

Noncatalytic

3.0

63 %

10600-34700

F1100S, I1100S Small Flush Insert, F1100S-1

Noncatalytic

3.8

63 %

09400-38700

F2000M Medium Freestanding Stove

Noncatalytic

7.1

63 %

11800-34200

F2100M-Medium Freestanding Stoves, I2100M-Medium Fireplace Insert

Noncatalytic

3.8

63 %

11700-38700

F2100MI

Noncatalytic

3.9

63 %

11,300-38,800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Fireplace Insert R-16	Noncatalytic	6.6	63 %	11100-32900
FP90, EX-90/R90 Wood Fireplace	Noncatalytic	3.8	63 %	11,700-42,300
H200 Hampton Cast Freestanding Stove	Noncatalytic	3.9	63 %	10,900 - 19,400
H2100M Hearth Heater Insert	Noncatalytic	3.5	63 %	10800-46900
Hampton Medium Cast Freestanding Woodstove Model H300	Noncatalytic	4.2	63 %	10,600-28,500
I2000M14	Noncatalytic	4.5	63 %	11200-42700
Large Freestanding Stove - F3100L & Large	Noncatalytic	4.2	63 %	11900-42900
Large Freestanding Woodstove R6,RA6,RA8	Noncatalytic	3.9	63 %	11500-59000
Medium Freestanding R3, RA3, R9	Noncatalytic	4.2	63 %	11200-35500

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Model 2400M, I2400M, S3400, HI300, CC75	Noncatalytic	3.4	63 %	12000- 36800
Regency R14-2	Noncatalytic	5.0	63 %	11500-37500
Small Freestanding R7, RA7, R5	Noncatalytic	8.3	63 %	5900-33500
Z2500L Zero Clearance Fireplace	Noncatalytic	5.2	63 %	10600-39700

Foundries du Lion S.A.
5 Voie Axiale
Couvin 5660 ,
Belgium
+ 32 60 31 01 04

Efel Harmony 386.75	Catalytic	3.8	72 %	7100-51000
Efel Symphony 387.74	Catalytic	5.1	72 %	10600-49700
Efel Symphony 390.74	Catalytic	1.8	72 %	10700-33000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Harmony I

Noncatalytic

4.4

63 %

11800-55000

Harmony IIIB

Noncatalytic

2.7

63 %

11,200-57,300

Model S-33,S-83,H33,R33,X33

Noncatalytic

3.3

63 %

8,600-37,300

Foyers Supreme Incorporated

3594 Jarry East
Montreal, Quebec H1Z2G4

,

<http://www.supremem.com/index.html>

Supreme Plus

Noncatalytic

7.0

63 %

96,000-16,300

Volcano Plus

Noncatalytic

4.3

63 %

11,310-25,189

Frantech, Inc.

900 George Street
Marshfield MO65706 ,
USA
417-466-7161

<http://www.countryflame.com/>

Seefire 1600 S

Noncatalytic

7.0

63 %

11700-23100

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Seefire 2100 S

Noncatalytic

3.2

63 %

11000-31100

Seefire 900 S

Noncatalytic

6.5

63 %

10200-30800

Gibraltar Stoves, Inc.

512-72nd Street

Holmes Beach FL34217 ,

USA

813-779-2217

LCC, MCC, SCC, CFS, CFI & DDI

Catalytic

2.8

72 %

8400-28700

GLG Australia

Auburn New ,

Australia

Pearl Bay

Noncatalytic

3.8

63 %

11,300-35,300

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Glo King/Pierce Engineered Products Inc.

P.O. Box 10107

**Eugene OR97440 ,
USA**

400HT

Noncatalytic

7.0

63 %

10000-40200

GK 100 HT

Noncatalytic

3.2

63 %

10600-61400

GK-300HT

Noncatalytic

7.0

63 %

11000-31000

GK-500HT

Noncatalytic

6.4

63 %

10000-22400

Godin Imports, Inc.

8 Lahave St.

South Portland ME04106-490 ,

USA

207-773-1920

Nouvelle Epoque 3137

Catalytic

3.9

72 %

10500-20700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

H.M.F. Forlong and Maisey Ltd.

15 Vickery Street
Private Bag 3126
Te Rapa - Hamilton ,
New Zealand
64-7-849 2212
<http://www.forlongmaisey.co.nz/>

Merlin "3", M 3000

Noncatalytic

6.1

63 %

12300-37000

Hajduk

Prima MR-51

Noncatalytic

3.8

63 %

11,636-35,246

Harman Stove Company

Box 619
352 Mountain House Road
Halifax PA17032 ,
USA
(717) 362-9080

CW30

Noncatalytic

3.6

63 %

10000-34000

Invincible RS

Pellet

1.5

78 %

6200-32800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Model Exception TL200	Noncatalytic	4.4	63 %	11000-42400
Model Exception TL300	Noncatalytic	1.1	63 %	11,238-34921
Oakwood	Noncatalytic	2.3	63 %	10,900-30,500
Treemont TAC-260C,TAC-260CF	Catalytic	3.9	72 %	8400-40700
Treemont TAC-340C	Catalytic	2.8	72 %	7400-33800
Treemont TAC-520C	Catalytic	5.2	72 %	12000-37300
Hase Kaminofenbau Care of Hearthstone 317 Stafford Avenue , Morrisville, VT 05661				
Bari	Noncatalytic	3.6	63 %	11,805-31,653

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Hawke Manufacturing Company, Inc.

19 Warehouse Circle
P.O. Box 507

Marietta SC29661 ,
USA
803-836-8008

HMI 28II

Catalytic

2.6

72 %

6100-39600

Hearth and Home Technologies

,

2100 ACC

Noncatalytic

2.1

63 %

11,400-27,200

4300ACC

Noncatalytic

1.1

63 %

11,842-38,305

5700 ACT

Noncatalytic

4.2

63 %

11800-45900

7100FP

Noncatalytic

3.1

63 %

13,800-67,300

Arrow 14, 20

Noncatalytic

4.0

63 %

14000-36100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Arrow 18	Noncatalytic	7.2	63 %	14500-34400
Arrow 55	Catalytic	3.0	72 %	9900-37500
Arrow Fireplace Insert 25	Catalytic	4.7	72 %	11300-55000
Arrow S12 (Stove) & I12 (Insert)	Noncatalytic	3.7	63 %	9900-32100
Aurora Model 700	Noncatalytic	4.3	63 %	11800-30900
Heat N Glo FT-210	Noncatalytic	3.9	63 %	9,800-36,600
Heat N Glo Number FT-300	Noncatalytic	3.3	63 %	10,000-41,000
Heat-N-Glo FT-210	Noncatalytic	3.9	63 %	9,800-36,600
Heatilator 11, 12	Noncatalytic	5.1	63 %	12400-36100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Heatilator 1190/Arrow 1490(S20)	Noncatalytic	6.1	63 %	10500-44500
Model 2590	Catalytic	3.8	72 %	9900-34300
Model 2700I	Noncatalytic	4.2	63 %	11200-35900
Model 400	Noncatalytic	2.9	63 %	8700-2200
Northstar/Constitution	Noncatalytic	3.3	63 %	11,300-51,200
Quadra Fire 2100 Millennium & 2100 ACT	Noncatalytic	2.0	63 %	10900- 37200
Quadra Fire 4300 ACT	Noncatalytic	1.2	63 %	11900-58500
Quadra-Fire 1800	Noncatalytic	5.1	63 %	10600-31300
Quadra-Fire 2000, 2000-I	Noncatalytic	6.1	63 %	7400-43700

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Quadra-Fire 2100, 2100 I	Noncatalytic	3.6	63 %	9300-39300
Quadra-Fire 3000F, 3000 I	Noncatalytic	6.5	63 %	9000-44700
Quadra-Fire 3100 ACC	Noncatalytic	1.1	63 %	11900-43200
Quadra-Fire 3100 ACT & 3100I ACT	Noncatalytic	1.3	63 %	11400-46900
Quadra-Fire 3100F, 3100 I	Noncatalytic	2.1	63 %	11900-43200
Quadra-Fire 4100	Noncatalytic	4.0	63 %	11700-50500
Quadra-Fire 5100 I ACT B		2.0	63 %	11,900-50,600
Quadra-Fire 5100-I Fireplace Insert	Noncatalytic	2.7	63 %	11800-49900
Quadra-fire Cape Cod	Noncatalytic	2.2	63 %	11500-43000

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Quadra-Fire Cumberland Gap	Noncatalytic	3.4	63 %	11,200-44,300
Quadra-Fire Isle Royale	Noncatalytic	2.9	63 %	10400-46800
Quadra-Fire Model 4100I and Bodega Bay	Noncatalytic	3.1	63 %	9,000-41,800
Quadrafire 1800 I	Noncatalytic	4.9	63 %	10000-33200
Quadrafire 1900	Noncatalytic	2.2	63 %	11500-32200
Quadrafire 4300	Noncatalytic	2.1	63 %	11900-39900
S-22 & S-22I	Noncatalytic	4.0	63 %	12000-36900
S10 and I10	Noncatalytic	5.9	63 %	11200-40600
Yosemite	Noncatalytic	2.7	63 %	10900-28600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Hearthstone Quality Home Heating Products Inc.

317 Stafford Avenue

Morrisville VT05661 ,

USA

802-888-5232

<http://www.hearthstonestoves.com/>

Bennington

Noncatalytic

3.6

63 %

11900-32600

Clydesdale Model 8490

Noncatalytic

3.1

63 %

11,900-33,100

Craftsbury 8390

Noncatalytic

3.1

63 %

10,973-25,563

Equinox

Noncatalytic

3.1

63 %

12,000-37,900

Heritage

Noncatalytic

2.3

63 %

10700-29400

Homestead 8570

Noncatalytic

1.9

63 %

10500-33600

Morgan model 8470

Noncatalytic

4.3

63 %

10500-29300

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Phoenix 8612	Noncatalytic	2.4	63 %	10500-41500
Shelburne Model 8370	Noncatalytic	2.1	63 %	11,800-32,400
Starlet	Noncatalytic	3.6	63 %	9200-25400
Tribute Model 8040	Noncatalytic	3.0	63 %	10,600-28,300

HearthStone Quality Home Heating Products, Incorporated

317 Stafford Avenue
 Morrisville VT05661 ,
 USA
 802-888-5232

<http://www.hearthstonestoves.com/>

Heritage I, Model 8021	Noncatalytic	2.7	63 %	11,700-32,800
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Heat Tech Industries

P.O. Box 727
 Biggs CA95917 ,
 USA
 916-868-1020

<http://www.heat-techstoves.com/>

No. 26 GM	Noncatalytic	4.0	63 %	11300-35800
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Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Heat-N-Glo Fireplace Products, Inc.

1445 North Highway

Colville WA99114 ,

USA

509-684-3745

<http://www.heatnglo.com/>

CBS-41

Noncatalytic

3.9

63 %

10000-30300

Heatilator, Inc.

1445 North Highway

Colville WA99114 ,

USA

509-684-3745

<http://www.aladdinhearth.com/>

1890(S30)

Pellet

5.7

78 %

11200-42700

Heatilator LE

Noncatalytic

4.5

63 %

11500-44400

Heating Energy Systems, Inc.

14300 SE Industrial Way

P.O. Box 593

Clackamas OR97015 ,

USA

503-786-4004

Trailblazer 1700/1706

Noncatalytic

4.6

63 %

11000-32400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Trailblazer Classic 1300/1306	Noncatalytic	3.2	72 %	11300-32400
Trailblazer Classic 1500/1700	Noncatalytic	4.9	63 %	9500-36600
Trailblazer Genesis 1600, Classic 1500	Noncatalytic	8.2	63 %	12100-28100
Trailblazer Genesis 1600/1800	Noncatalytic	3.0	63 %	11400-36400
Trailblazer Genesis 2000-C	Catalytic	3.1	72 %	10600-37500
Heritage Stoves Inc.				
352 South Main Street				
Clearfield UT84015 ,				
USA				
801-773-8606				
American 2000C	Catalytic	5.5	72 %	13600-33800
Bostonian 2500 C (Insert)	Catalytic	3.8	72 %	10600-22300

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Bostonian 2500C

Catalytic

6.8

72 %

9600-37300

Hestia Heating Products

,

Model HHP 1

Pellet

2.9

78 %

7,900-30,200

Hi-Teck Stoves

2985 South, 3600 West

Salt Lake City UT84119 ,

USA

1-800-456-8606

Hi Teck H 2000C

Catalytic

3.6

72 %

12600-41400

High Energy Manufacturing, Limited

PO Box 400

Vermillion Bay, Ontario POV 2VO ,

Canada

807-227-2745

J1000 Pellet Stove

Pellet

2.1

78 %

13,000 - 21,800

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

High Sierra Stoves, Ltd.

P.O. Box 1247

720 North Mulberry Street

Hildale UT84784 ,

USA

Ambassador 4700TE

Catalytic

2.5

72 %

10100-37600

Cricket 5300

Noncatalytic

6.6

63 %

11000-36400

Cricket MHCR 5200

Catalytic

3.5

72 %

6800-27600

Diplomat 4300 TE

Catalytic

5.1

72 %

10400-53400

Evolution 7000TE,7000C

Catalytic

4.0

72 %

11200-43000

Evolution 8000TE

Catalytic

2.2

72 %

7900-40500

Evolution Model 7000C

Catalytic

2.8

72 %

7700-29400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Sierra Ambassador 4700 TEC	Catalytic	3.2	72 %	10800-42600
Sierra Classic 1500B	Noncatalytic	6.9	63 %	8600-34700
Sierra Classic 1500T	Noncatalytic	7.5	63 %	6900-34600
Sierra Evolution 8000 TEC	Catalytic	2.5	72 %	9700-35900
Sweet Home Catalytic Fir AK-18	Catalytic	3.1	72 %	8800-29500
Sweet Home NFX-HT	Noncatalytic	7.8	63 %	14500-33200
Sweet Home Solitaire PFA 2000	Pellet	4.0	78 %	9700-28200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

High Valley Construction & Maintenance Corp.

6573 Highway 226S

Spruce Pine NC28777 ,

USA

828-765-4004

<http://www.highvalleystoves.com/start.shtml>

High Valley 2000, Craft Stove 2000

Catalytic

3.3

72 %

10800-43100

High Valley Bay 2500

Catalytic

3.1

72 %

7700-40900

High Valley Model 1500

Catalytic

3.4

72 %

9400-34200

Model 1600

Noncatalytic

2.7

63 %

11800-40400

Hitzer, Inc.

269 East Main Street

Berne IN46711 ,

USA

(219) 589-8536

<http://www.hitzer.com/>

Glo King 300HT

Noncatalytic

7.0

63 %

11000-31000

Glo King 400HT

Noncatalytic

7.0

63 %

10000-40200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Glo King 500SD

Noncatalytic

6.4

63 %

10000-22400

Horizon Research Inc.

Suite #105

17905 Bothell Way Southeast

Bothell WA98012 ,

USA

Eclipse

Pellet

1.0

78 %

7800-33100

Model HR-2

Pellet

0.9

78 %

10500-33400

Hussong Manufacturin Company, Inc.(Kozy Heat)

,

Olivia, Model Number OVL-PC

Noncatalytic

2.5

63 %

8,100-21,400

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Hussong Manufacturing Company, Inc.

204 Industrial Park Drive

Lakefield MN56150 ,

USA

507-662-6641

<http://www.kozyheat.com/>

Kozy Heat Z 42

Noncatalytic

3.3

63 %

11500-35100

Hutch Manufacturing Company

200 Commerce Avenue

P.O. Box 350

Loudon TN37774 ,

USA

(800) 251-9232

DWI-42C

Catalytic

1.6

72 %

9800-54600

DWI-42C-2 (EPA)

Catalytic

1.5

72 %

10700-52800

HRD-18C

Catalytic

4.5

72 %

9300-39100

HRD-27C Catalytic Freestanding

Catalytic

2.5

72 %

10300-56200

HRS-18C Small Freestanding

Catalytic

2.9

72 %

10300-38400

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Ingenieria De Combustion Bosca Chile S.A.

Americo Vespucio 2077

Santiago ,

Chile

Gold 400

Noncatalytic

4.4

63 %

11,800-26,800

Spirit 500

Pellet

1.2

78 %

8,700-21,700

Spirit 550

Noncatalytic

3.6

63 %

11,359-26,100

J. A. Roby

490 Rue de L'Argon

Charlesbourg, Quebec ,

G2N 2C9

Evolution and Atmosphere

Noncatalytic

6.9

63 %

9,043 - 28,675

Mystere

Catalytic

6.0

63 %

12,900-24,200

Vulcain

Noncatalytic

6.1

63 %

9,501.-29180

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Jacuzzi Leisure Products, Inc.

Route 107, P.O. Box 501

Bethel VT05032 ,

USA

802-234-2300

Cabot Elite S17XE

Noncatalytic

4.5

63 %

11300-34400

Campbell Elite S14XE

Noncatalytic

5.1

63 %

11000-31100

Douglas Elite S131E, S132E; Mini Elite S111E,S112E

Noncatalytic

7.1

63 %

10400-22200

Fraser Elite I, S407E, S408E, S409E

Noncatalytic

3.4

63 %

10000-37900

Gordon Elite S18XE

Noncatalytic

3.0

63 %

11300-31200

Model Campbell II Elite S-24X & FW24 Series, CJW1000L02,

Noncatalytic

5.3

63 %

10600-26100

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Jayline Heating Ltd.
106 Henderson Valley Road
Auckland ,
New Zealand
64 9 836 0858

AMZED JAYLINE 1B AND FS

Noncatalytic

5.4

63 %

9500-40400

Amzed Jayline Ukal U-12

Noncatalytic

2.9

63 %

9900-28200

Jotul North America (Jotul U.S.A., Inc.)

400 Riverside Street
Portland ME04104 ,
USA
207-797-5912

<http://www.jotulflame.com/>

Alpha 350132

Catalytic

3.1

72 %

10100-33000

American Fireplace Stove 3TDC

Catalytic

4.0

72 %

8800-31700

C450, Tamarack

Noncatalytic

4.4

63 %

11,900-36,100

C550

Noncatalytic

7.1

063 %

12,034-36,669

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Castine F400	Noncatalytic	3.8	63 %	11300-27800
F100 Nordic QT	Noncatalytic	3.0	63 %	7,700- 27,400
F118 CB	Noncatalytic	3.5	63 %	12,000-23,500
F3CBII	Noncatalytic	3.8	63 %	11400-43500
F500	Noncatalytic	3.2	63 %	12000-34700
Firelight 12	Catalytic	2.4	72 %	10500-32100
Firelight 12CB	Noncatalytic	4.4	63 %	13500-45900
Jotul F600	Noncatalytic	4.1	63 %	11,600-32,500
Jotul Model 602 CB Classic	Noncatalytic	5.2	63 %	9700-42100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Jotul Oslo F-500	Noncatalytic	3.0	63 %	10900-35000
Jotul Petite	Noncatalytic	4.5	63 %	10500-39900
Model 3 CB	Noncatalytic	5.8	63 %	11900-58300
Model 3 TDIC-2	Catalytic	3.6	72 %	10900-30600
Model 8 TDIC	Catalytic	3.8	72 %	10900-35100
Model C350	Noncatalytic	4.0	63 %	11,500-34,200
Model Series 8	Catalytic	3.1	72 %	12600-33000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Jydepejsan A/S

Wittus Fire by Design

PO Box 120 ,

Pound Ridge, NY 10576

914-764-5679

www.wittus.com

H530

Noncatalytic

63 %

0

Trendline, Soft Line, Fine Line, Zeus, Athene, Troja, Hera, Avanti

Noncatalytic

3.9

63 %

11300- 28100

Kent Heating Limited

P.O. Box 23-340 Papatoetoe

59 Tidal Road Mangere

Auckland ,

New Zealand

Fax 649-275-7558

<http://www.kentheating.com/>

Catalytic Tile Fire

Catalytic

2.0

72 %

5900-24500

Log Fire 2000

Noncatalytic

7.0

63 %

11200-23700

Log Fire LPE

Noncatalytic

5.9

63 %

8900-28200

Sherwood 2000

Noncatalytic

8.1

63 %

13000-26600

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Sherwood L.E.M. XLE-1	Noncatalytic	6.5	63 %	9600-33400
Tile Fire 2000, Ultima 2000	Noncatalytic	6.3	63 %	12500-21700
Tile Fire L.E.M. TLE-1	Noncatalytic	5.9	63 %	8500-38600
Ultima 2000S	Noncatalytic	4.5	63 %	11000-23000

Krog Iversen & Co. A/S
 Glasvaenget 3-9
 Postboks 60
 Vissenbjerg 5492 ,
 Denmark
 45 64 47 31 31
<http://www.warmfurniture.com/>

Andersen 8	Noncatalytic	2.9	63 %	11900-30100
Andersen 8.2	Noncatalytic	3.5	63 %	7,600-28,800
Basic 1 & 3	Noncatalytic	2.2	63 %	10032-17906

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Basic 4	Noncatalytic	2.2	63 %	10000-22100
DSA 4	Noncatalytic	1.1	63 %	10,500-27,900
Model Scan 61	Noncatalytic	4.5	63 %	10,600-29,300
Scan 10-A	Noncatalytic	4.4	63 %	11,600-37,700
Scan 20	Noncatalytic	5.1	63 %	9900-19000
Scan 24	Noncatalytic	2.9	63 %	11300-22500
Scan 4.5	Noncatalytic	3.3	63 %	9,500-31,000
Scan 47.2	Noncatalytic	3.1	63 %	10400 - 30900
Scan 5.2	Noncatalytic	4.2	63 %	11800-26500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Kuma Stove And Iron Works

450 Old Highway 95

Hayden ID83858 ,

USA

208-762-8002

<http://www.kumastoves.com/>

Kuma K-300/K-400, K-100B

Catalytic

2.8

72 %

12100-65200

Kuma Scott HT-1

Noncatalytic

3.5

63 %

11700-29800

Kuma Wood Classic Model HT-2

Noncatalytic

3.2

63 %

11300-48000

Model Kuma 100/300/400

Catalytic

2.2

72 %

10100-52100

Lennox Hearth Products

1110 West Taft Ave.

Orange CA92865 ,

USA

714-921-6100

<http://www.lennoxhearthproducts.com/>

1000HT, 1100HT, 2000HT, 2200HT

Noncatalytic

8.3

63 %

6600-32200

1003-C

Catalytic

3.7

72 %

11700-36800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
2800HT	Noncatalytic	4.5	63 %	11500-46700
Bayview BV400, BV450	Catalytic	5.5	72 %	11000-53700
Bayview BV450C/BV400C-2	Catalytic	3.0	72 %	11000-48100
Bayview II, 2000C, BV4000C, BV4000C-2	Catalytic	1.9	72 %	6600-40900
Bayview II BV4000	Catalytic	3.1	72 %	9200-42300
Brass Flame KS-1005, KS-2000I	Noncatalytic	6.0	63 %	11800-44000
Brass Flame KS-805	Noncatalytic	6.0	63 %	9300-49800
Brass Flame KS-805	Noncatalytic	5.3	63 %	9300-49800
Earth Stove and Ranger 1500HT, 1400HT	Noncatalytic	6.6	63 %	11700-37000

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
KS-1005, SV-14; KS-2000, FI-15	Noncatalytic	6.0	63 %	9500-41100
Model T200C	Catalytic	3.2	72 %	8500-34900
Traditions T-100	Catalytic	3.8	72 %	8300-43800
Traditions T150C, T100SC	Catalytic	4.1	72 %	6500-35300
Traditions T300HT & T3000HT	Noncatalytic	2.6	63 %	10700-37400
Whitfield Advantage WP-2	Pellet	1.3	78 %	10900-35100
Whitfield Fireplace/Hearth Stove	Pellet	1.0	78 %	11000-35700
Whitfield WP-1, III T, II-T, II-TC, Advantage Series	Pellet	1.0	78 %	9100-37800
WP-2 III T, II-TC, Advantage Series	Pellet	1.0	78 %	9100-37800

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Les Produits d'Acier Nordic International

11725 Philippe-Panneton

Montreal Quebec H1E 4M1 ,

Canada

514-494-4522

Diamant

Noncatalytic

7.5

63 %

11,100-26,100

Olympia

Catalytic

4.6

72 %

9,659-26,407

Rustic 2100 and Tradition 2100

Noncatalytic

5.0

63 %

11,700-29,700

Lexington Forge

,

Savannah SSW 20 and Windsor WCS20

Noncatalytic

3.8

63 %

11,000-45000

SSI 30

Noncatalytic

3.5

63 %

11,000-30,600

SSW 30

Noncatalytic

3.5

63 %

11,000-30,600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Long Agribusiness

111 Fairview Street
P.O. Box 1139

Tarboro NC27886 ,
USA
252-823-4151

2062 Catalytic freestanding/insert

Catalytic 3.3 72 % 10600-20700

Silent Flame 2058

Catalytic 5.3 72 % 9000-27100

Silent Flame Model 2058A

Catalytic 2.3 72 % 9600-30600

Silent Flame Model 2062

Catalytic 2.4 72 % 9900-32600

Luap Associates, Inc.

2720 Roosevelt Blvd.

Eugene OR97402 ,
USA
503-461-2141

Eagle 2001

Pellet 2.6 78 % 8400-55200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Lucky Distributing

8111 NE Columbia Blvd
Portland, OR 92718 ,
503-252-1249

Esprit

Noncatalytic

4.4

63 %

11,817-32,263

Integra

Pellet

3.6

78 %

10,024-31,268

M. Texeira International, Incorporated

85 Myer Street
Hackensack, New Jersey 07601
210-525-0024 ,
www.soapstones.com

520 H

Noncatalytic

6.4

63 %

11,721-25,859

Martin Industries, Inc.

301 E. Tennessee Str.
P.O. Box 128
Florence AL35631 ,
USA
256-767-0330

Ashley

Catalytic

3.8

72 %

5700-35300

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Ashley APC2,APC2C; King KC2,KC2B; Atlanta AC2,AC2B	Catalytic	3.0	72 %	9700-27900
Ashley APS5,APS5B; King KC5,KC5B; Atlanta AC5,AC5B	Catalytic	3.8	72 %	9400-35400
Ashley CAHF,CAHFB; King MCF,MCFB; Atlanta ACF,ACFB	Catalytic	4.8	72 %	9900-30000
C-92	Catalytic	2.4	72 %	7200-29500
C-92	Catalytic	5.3	72 %	5200-33200
C-92	Catalytic	3.0	72 %	13900-35700

Max Blank GmbH
 Lake Bluff IL ,
 USA

<http://www.maxblank.com/>

Atlanta K02, Siena, Monza, Davos, Ravenna, Heidelberg, Solero, Toulouse, Zitro, Rio, Memphis, Niagara,
 Noncatalytic 4.5 63 % 11,479-36,009

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Bordeaux

Noncatalytic

5.6

63 %

10,129-34,342

Florenz K0 2, Volterra, Padua, Atlanta BF

Noncatalytic

3.1

63 %

11,842-34,680

Mega K 03

Noncatalytic

5.1

63 %

10,500-33,000

Metal M.D.R. Inc.

536 Guy Street

Granby Quebec J2G 7J8 ,

Canada

450-777-6070

Model HE-1400, XE-1400, & XTD-1.5

Noncatalytic

4.3

63 %

10800-34000

XVR-111, XT-4000, XLT-11000

Noncatalytic

%

11,700-28,300

Morso Jernstaber

Furvej 6

DK-7900

Nykobing Mor ,

Denmark

45 96 69 19 00

<http://www.morsoe.com/us/index.html>

2B Classic

Noncatalytic

3.9

63 %

10900 -23600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Morso Jernstoberi

,

6100

Noncatalytic

63 %

Model 2B

Noncatalytic

4.1

63 %

9,300-30,700

Model 5660,

Noncatalytic

%

Morso Jernstoberi A/S

Furvej 6
DK-7900

Nykobing Mors
Denmark

45 96 69 19 00

<http://www.morsoe.com/us/index.html>

3600 Series

Noncatalytic

5.2

63 %

11,400-49,500

8140, 8142, 8147, 8151 and 8150

Noncatalytic

4.5

63 %

10,864-25,370

Model 2040

Noncatalytic

3.8

63 %

11,100-40,100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Model 4600	Noncatalytic	3.2	63 %	11,100-25,600
Model 4650 (Soapstone)	Noncatalytic	3.7	63 %	10,900-25,700
Model 7110	Noncatalytic	3.8	63 %	10,700-27,900
Morso 1710	Noncatalytic	4.4	63 %	12,000-39,800
Owl 3410/3440 & 3450	Noncatalytic	3.5	63 %	8400-23600
Panther 2110	Noncatalytic	4.7	63 %	10300-60500
Panther Model 2110B	Noncatalytic	4.3	63 %	8,600-42,100
Squirrel 1410 and 1420	Noncatalytic	3.3	63 %	9600-22000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

National Steelcrafters of Oregon

P.O. Box 24910

P.O. Box 2501

Eugene OR97402 ,

USA

(503) 683-3210

<http://www.breckwell.com/>

Breckwell W3000FS/W3000I

Noncatalytic

2.3

63 %

11600-33700

Chateau NC24

Noncatalytic

5.4

63 %

14500-51000

Craft CB-4830 Insert

Catalytic

3.4

72 %

9100-22400

Craft Stove CB-4426

Catalytic

3.9

72 %

12100-35600

Craft Stove CB-4426, CB-26, CAT 44-1

Catalytic

3.9

72 %

12100-35600

Craft Stove CB-4830

Catalytic

3.1

72 %

11600-41100

Craft Stove CB-4830, CB-300

Catalytic

3.1

72 %

11600-41100

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Navigator Stove Works, Inc.

68 South First St.

Brooklyn N.Y.11211 ,

USA

718-486-8049

<http://www.marinestove.com/>

Navigator NSW2

Noncatalytic

3.6

63 %

10500-28200

NSW-1 Sardine

Noncatalytic

3.5

63 %

11,400-19,400

New Buck Corporation (Buck Stove Corp.)

1265 Bakersville Highway

P.O. Box 69

Spruce Spring NC28777 ,

USA

828-765-6144

<http://www.buckstovecorp.com/>

41BCV, BBay, CD, CS, CV, CBAY, PCV, PCBAY

Catalytic

2.6

72 %

6900-27800

50PCV, 50PBay, 50CV, 50CBay, 50CD, 50BCV, 50BBay

Catalytic

2.5

72 %

10100-38000

Bay Model 91

Catalytic

3.5

72 %

10400-50400

Big Buck 28000-C

Catalytic

4.7

72 %

8500-39100

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Buck Bay Model 91	Catalytic	1.2	72 %	8,800-51,200
Buck Carolina/Tharrington 51/T-51	Noncatalytic	6.7	63 %	11800-40900
Buck Master	Catalytic	2.1	72 %	10,800-49,800
Buck/Tharrington 74/T-74	Noncatalytic	3.6	63 %	11,600-41,400
Little Buck 26000-C	Catalytic	4.0	72 %	6800-38700
Model 18	Noncatalytic	3.1	63 %	10000-22400
Model 20, catalytic	Catalytic	3.2	72 %	10800-37500
Model 21	Noncatalytic	6.2	63 %	11400-41200
Model 21	Noncatalytic	4.4	63 %	12,000-444,000

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Model 26	Noncatalytic	5.4	63 %	11900-42600
Model 261	Noncatalytic	2.9	63 %	10271-32263
Model 70	Catalytic	5.0	72 %	9800-31300
Model 71 Freestanding/Insert Catalytic	Catalytic	3.6	72 %	13100-40200
Model 81/85	Noncatalytic	4.3	63 %	11900-45400
MODEL XL-80	Catalytic	2.7	72 %	9200-40500
New Buck/Carolina Model 17	Catalytic	1.2	72 %	8100-27900
Regular Buck 27000-C	Catalytic	3.8	72 %	14700-25100
Regular Buck 27000-CR	Catalytic	4.8	72 %	14700-30800

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

NHC Inc.

317 Stafford Avenue

Morrisville VT05661 ,

USA

802-888-5232

<http://www.hearthstonestoves.com/>

Harvest A-HII catalytic

Catalytic

2.5

72 %

10500-36400

Harvest HII

Catalytic

3.8

72 %

8800-28900

Mansfield

Noncatalytic

3.2

63 %

10200-27900

Mansfield I

Noncatalytic

2.9

63 %

13600-45300

Model 3-C

Noncatalytic

2.0

72 %

7900-15000

Phoenix

Noncatalytic

4.9

63 %

10300-43000

Phoenix

Noncatalytic

3.4

63 %

10400-35200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Nordpeis A/S

Lierskogen ,
Norway

<http://www.nordpeis.no/>

Saturn A

Noncatalytic

6.0

63 %

10,100-25,000

NU-TEC/Upland Distributors, Inc.

72 College Street
P.O. Box 908
East Greenwich RI02818 ,
USA

(401) 738-2915

<http://www.nutec-castings.com/>

Brenden BR-60

Catalytic

1.4

72 %

11000-29400

Townsend Woodstove TN-25

Catalytic

2.7

72 %

10200-27500

Upland Amity AM-40

Catalytic

2.6

72 %

10600-23600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

OK Doke, Ltd.

1425 Weld County Road 32

Longmont CO80501-961 ,

USA

(303) 776-2300

Sweethearth Presidential 800/800XL

Catalytic

3.6

72 %

9900-20000

Olsberg Hermann Everken, Gmbh

176 Saunders Road

Barrie ONL4N 9A4 ,

Canada

705-721-1388

<http://www.olsberg.com/>

Bristol OH-L

Noncatalytic

2.1

63 %

11,800-32,200

Bristol OH-M

Noncatalytic

2.7

63 %

11,000-33,200

Oregon Woodstoves, Inc.

1844 Main St.

P.O. Box 70107

Springfield OR97477 ,

USA

541-747-8868

#1, Design 01

Catalytic

2.7

72 %

9600-49700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Model OS/1

Catalytic

1.4

72 %

7800-40000

Orley's Manufacturing Company, Inc.

1718 W. Antelope Road

White City OR97503 ,

USA

503-777-5340

Cougar G-225

Catalytic

2.7

72 %

9100-36200

Leopard U245,U246,UO245,UO246; Panther F245,F246

Catalytic

3.5

72 %

9100-39000

Orrville Products, Inc.

375 East Orr Street

P.O. Box 902

Orrville OH44667-090 ,

USA

800-232-4010

<http://www.comfortecgasfireplace.com/>

CC 350

Catalytic

3.8

72 %

13700-68900

CC-185l and 165l

Noncatalytic

3.8

63 %

11500-48600

CC175 and CC155

Noncatalytic

4.4

63 %

10900-39200

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
CC180	Noncatalytic	3.9	63 %	10700-57600
CC185 and CC165	Noncatalytic	5.3	63 %	11300-46100
CC250	Catalytic	3.5	72 %	13200-29800
Country Comfort CC100	Noncatalytic	8.5	63 %	8700-33400
Country Comfort CC125	Noncatalytic	9.5	63 %	12300-27600
Country Comfort CC150, CC1000, CC150H	Noncatalytic	7.5	63 %	7200-23900
Country Comfort CC160	Noncatalytic	5.3	63 %	11600-36500
COUNTRY COMFORT CC160	Noncatalytic	2.9	63 %	11900-47800
Country Comfort CC325	Catalytic	3.5	72 %	18600-60600

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Country Comfort CC350

Catalytic

4.3

72 %

11200-29100

Osburn Manufacturing, Inc.

1700 Leonharmel

Quebec City QuebecG1N 4R9 ,
Canada

418-527-3060

<http://www.drolet.ca/Engindex2.htm>

1050

Noncatalytic

6.9

63 %

10600-42900

2200

Noncatalytic

5.7

63 %

10400-41500

Imperial 2000

Noncatalytic

4.6

63 %

9000-33000

Imperial MKII, MKII Insert, Goldenaire

Noncatalytic

7.0

63 %

10700-51600

Pacific Energy Fireplace Products Limited

P.O. Box 1060

Duncan BCV9L 3Y2 ,
Canada

250-748-1184

<http://www.pacificenergy.net/>

Alderlea, Super 27 Design D, Spectrum, Standard, Pacific Ins, Spectrum Classic and Fusion

Noncatalytic

3.4

63 %

11000-34600

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
S-27, Spectrum, Standard, Pacific				
	Noncatalytic	6.4	63 %	10600-36400
Summit Series A, Summit Insert, Summit Classic and Alderlea T6				
	Noncatalytic	3.6	63 %	10300-37500
Vista Series C, Vista Classic, Vista Artisan, Vista Insert, and Alderlea T4				
	Noncatalytic	2.9	63 %	12400-26300

Panda Wood Stoves
6261 Crater Lake Highway
Medford OR97504 ,
USA
503-826-7804

UMF-400				
	Catalytic	5.0	72 %	7600-38300

Pellefier Inc.
P.O. Box 487
Morton WA98356-048 ,
USA

Venturi PVI-87				
	Pellet	0.5	78 %	9000-31800

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Piazzetta S.p.A.
31010 Casell d'Asolo
Treviso ,
Italy

904

Noncatalytic

7.5

63 %

6700-28300

Model 905

Noncatalytic

6.8

63 %

11600-30300

Polar Fireplaces

4390 Paletta Court
Burlington Ontario L7L 5R2 ,
Canada
905-632-4710

Woodchief 300 E

Noncatalytic

4.8

63 %

11600-43700

Woodchief 400 E

Noncatalytic

5.1

63 %

11500-59000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Precision Gas Technologies

1390 17th Avenue S.E.

Calgary Alberta T2G 5J3 ,

Canada

403-262-4421

WS-250

Noncatalytic

4.0

63 %

11700-50500

PSG Distribution Inc.

798, 8 Ieme Avenue Est.

La Guadeloupe Quebec G0M 1G0 ,

Canada

1-418-459-6458

<http://www.psg-distribution.com/site.asp>

Caddy (duct furnace)

Noncatalytic

6.6

63 %

12000-52900

Rais A/S

23 Hack Green Road

Pound Ridge NY 10576 ,

USA

(914) 764-5679

<http://www.raiswittus.com/>

Gabo Pina Vola

Noncatalytic

2.1

63 %

12,000-26,700

Malta, Bando and Bora

Noncatalytic

4.3

63 %

11400-32900

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Rais 60-A Insert	Noncatalytic	7.2	63 %	11600-51300
Rondo, Mino II Steel and Mino II SST	Noncatalytic	4.3	63 %	11,431-22,561
Renfyre Stove Co./Maco Enterprises, Inc				
RR 2				
Drayton	Ontario	N0G 1P0		
Canada				
519-638-2746				
2800	Noncatalytic	3.4	63 %	11900-23700
5000 Combination Range Design #50001	Noncatalytic	5.5	63 %	13600-21600
Fireview 2300	Noncatalytic	7.0	63 %	11700-27500
Fireview Insert 2700	Noncatalytic	3.8	63 %	9400-27500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Reverso Manufacturing, Ltd.

790 Rowntree Dairy Road

Woodbridge Ontario L4L 5V3 ,

Canada

(416) 748-3064

Challenger MMX

Noncatalytic

2.6

63 %

11200-33800

Riteway-Dominion Manufacturing Company, Inc.

Box 5

1680 Country Club Road

Harrisonburg VA22801 ,

USA

(703) 434-3800

Dominion 005

Catalytic

4.5

72 %

7000-29100

RJM Manufacturing, Inc

P.O. Box 27

1210 Lowater Road

Chippewa Falls WI54729 ,

USA

715-720-1794

<http://www.energyking.com>

Achiever FPI-1-LEX

Catalytic

2.0

72 %

7900-26700

Energy King 2500C

Catalytic

3.0

72 %

16100-39800

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Energy King Bay 2000C	Catalytic	2.5	72 %	11400-34600
FPI-2-LEX/90	Catalytic	1.6	72 %	10300-36500
Model Silhouette 2850C	Catalytic	3.2	72 %	8100-34700

RSF / Industrial Chimney Company, Incorporated

400 J-F Kennedy

St. Jerome QCJ7Y 4C7 ,

Canada

450-565-6336

www.icc-rsf.com

Ardent HF 40	Noncatalytic	9.9	63 %	6400-30600
HT (Onyx), ONYX AP	Noncatalytic	4.5	63 %	11800-35600
Opel 2000C, OPEL AP	Catalytic	3.7	72 %	10600-49700
TOPAZ/CHAEMELON (With Fan)	Noncatalytic	5.5	63 %	9500-25800

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

TOPAZ/CHAMELEON (Without Fan), TOPAZ, Chameleon

Noncatalytic

4.0

63 %

11100-25700

Russo Products, Inc.

61 Pleasant Street

Randolph MA02368 ,
USA

781-963-1182

GV-30C

Catalytic

3.1

72 %

10300-39400

GV-30S

Catalytic

2.5

72 %

9500-38700

Russo Glassview GV-21

Catalytic

2.9

72 %

10200-29600

W-18C

Catalytic

6.2

72 %

7900-40900

W-25C

Catalytic

2.4

72 %

8400-31300

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Salvo Machinery, Inc.

P.O. Box 6145
220 Shove Street
Fall River MA02724 ,
USA
508-678-7507

Citation Classic W45NC/WI45NC

Noncatalytic 7.1 63 % 11800-32200

Model Citation

Catalytic 2.4 72 % 9600-33500

Sarratt Agencies Limited

1/677 Boronia Road
c/o Meridian Heating
Wantirna 3152 ,
Australia
(0061-3) 887-2687

Merlin 3 FS-15, IS-15

Noncatalytic 6.1 63 % 9800-21100

Saxon Wood Heaters Pty, Ltd.

45 Princes Road West
Auburn 02144 ,
Australia
+61 363811322

<http://www.tasmaniacentral.tas.gov.au/saxon/>

Rosewood

Noncatalytic 2.7 63 % 11600-36200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Security Chimneys International Ltd.

2125 Monterey

Laval Quebec H7L 3T6 ,

Canada

450-973-9999

<http://www.securitychimneys.com/>

BIS Design No. 1.2

Noncatalytic

5.5

63 %

14200-55800

BIS II

Noncatalytic

5.3

63 %

11300-41500

BIS Panorama, Villa Vista

Catalytic

4.1

72 %

10900-35,600

BIS Tradition and Montecito Estate

Noncatalytic

7.3

63 %

11,500-39-300

BIS Ultima, Brentwood, BIS Tradition CE, and Montecito

Noncatalytic

3.7

63 %

10,442-27,746

BIS Ultra

Noncatalytic

5.1

63 %

11033-46700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Selkirk Canada Corporation

Model: HE36

Noncatalytic

1.0

63 %

6,668-15,290

Model HE40

Noncatalytic

5.7

63 %

11,383-45,459

Shenandoah Manufacturing Company, Inc.

P.O. Box 839

Harrisonburg VA22801 ,

USA

(703) 434-3838

CH-77, CH-84

Catalytic

3.1

72 %

8000-33800

Sherwood Industries, Ltd.

6782 Oldfield Road

Saanichton BCV8M 2A3 ,

Canada

604-652-6080

<http://www.enviro-fire.com/>

EF 3, Meridian and VF 100

Pellet

2.0

0 %

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Empress/Windsor	Pellet		78 %	
Enviro 1200, 1200I, Vista Flame 1200, 1200I	Noncatalytic	3.3	63 %	11,500-34,200
Enviro Fire 1000FS and Vista Flame 1000FS	Noncatalytic	4.1	63 %	11700-32700
Enviro Model 1700I, 1700 & Vista Flame 1700I, 1700	Noncatalytic	4.5	63 %	9,400-31,800
Envirofire EF2, EF2i, FS and FPI	Pellet	1.3	78 %	6,500-34,000
Envirofire - EF3 FS, FPI, EF3Bi FS, Vista Flame VF100 FS	Pellet	2.0	78 %	6,500-40,000
Envirofire - Meridian FS & FPI	Pellet	2.0	78 %	6,500-40,000
Greenfire GF55, GFI55	Pellet	2.0	78 %	6,500-40,000
OMEGA	Pellet		%	

Model Name	Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Vista Flame 1600 FS, 1600 FPI, Envirofire 1600 FS, 1600 FPI			
Noncatalytic	3.5	63 %	11500-33600
Vista Flame 2100 FS, Envirofire 2100 FS			
Noncatalytic	2.9	63 %	11800-34000
Vista Flame Envirofire 1000			
Noncatalytic	6.5	63 %	10200-30800
Vista Flame Envirofire 1500			
Noncatalytic	7.0	63 %	11700-23100
Vista Flame Envirofire 2000			
Noncatalytic	3.2	63 %	11000-31100
Vista Flame Envirofire EF II			
Pellet		78 %	
Vista Flame Envirofire Evolution Model EF 5/VF 5			
Pellet		%	
Vista Flame Envirofire Pellet Stove			
Pellet		78 %	

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Stove Builder International

Apollo

Noncatalytic

63 %

BIO-35MF

Noncatalytic

63 %

6,668-15,290

BIO-45MF

Noncatalytic

1.2

63 %

8,569-29,784

FP2, FP5, FP7

Pellet

78 %

Monaco

Noncatalytic

4.4

63 %

11,479-30,450

Stove Builder International Inc.

1700 Leonharmel

Quebec City Quebec G1N 4R9 ,

Canada

418-527-3060

<http://www.drolet.ca/Engindex2.htm>

1600

Noncatalytic

4.4

63 %

11800-42400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
1600 B-I/Ashley 4600/Forester 4700	Noncatalytic	4.8	63 %	11900-35500
2200 Bay/2000	Noncatalytic	2.7	63 %	11700-30400
Apollo/Apollo II	Noncatalytic	3.6	63 %	10600-24700
Emerald 2000	Pellet	1.7	78 %	7500-24500
Gemini 1500 (With Blower)	Noncatalytic	6.2	63 %	11500-43900
Gemini 1500N (Without Blower)	Noncatalytic	7.5	63 %	11100-37300
HT 1600-Standard/HT 1600 Deluxe/HT-1600 Siberian/Ashley 1600	Noncatalytic	3.5	63 %	11200-26400
HT-2000 Standard/HT-2000 Deluxe/HT-2000	Noncatalytic	3.9	63 %	11600-60300
Le Chancelier, NXT-1 and Solution 2.9	Noncatalytic	4.5	63 %	11900-29400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
LeBachelier	Noncatalytic	4.9	63 %	11800-24500
New Generation NG 1800/Magnolia 2015	Noncatalytic	5.7	63 %	11,500-30,800
Osburn 1100	Noncatalytic	5.7	63 %	11000-35000
Osburn 1800	Noncatalytic	2.7	63 %	9700-36300
Osburn 2400 B	Noncatalytic	3.5	63 %	11900-40900
Sahara	Noncatalytic	7.5	63 %	11,000-25,700
XVR-I/XLT-1/XT-1800 Classic EPA	Noncatalytic	6.9	63 %	11,400-27,500
XVR-II, XT-1400 adn XLT-II	Noncatalytic	5.9	63 %	11800-27300

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Stove Builder International Incorporated

1700 Leonharmel Street

Quebec City Quebec G1N 4R9 ,

Canada

418-527-3060

<http://www.drolet.ca/Engindex2.htm>

HT-1200 and Ashley 1200

Noncatalytic

6.5

63 %

8300-36000

StoveBuilder International, Inc.

536 Guy Street

Granby Quebec J2G 7J8 ,

Canada

450-777-6070

Model HE-1800, XE-1800 & XTD-1.9

Noncatalytic

5.9

63 %

11600-38700

XTD1.1/XE-1000

Noncatalytic

6.0

63 %

9900-47300

Suburban Manufacturing Company

676 Broadway Street

P.O. Box 399

Dayton TN37321 ,

USA

(615) 775-2131

Woodchief W6-88C, Woodmaster W6-88WC

Catalytic

3.4

72 %

9500-42500

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

TEC Enterprises

Box 23

Lewiston ID83501 ,

USA

(208) 843-7297

2000 pellet stove

Pellet

4.7

78 %

11600-22500

Thelin Company Inc.

P.O. Box 847

Nevada City NV95959 ,

USA

(916) 273-1976

<http://www.thelinco.com/>

Thelin T-4000

Noncatalytic

3.6

63 %

9,900-38400

Thermic Distribution Europe

5 Voie Axiale

Couvin 5660 ,

Belgium

+ 32 60 31 01 04

Efel Harmony 386.75

Catalytic

3.8

72 %

7100-51000

Efel Symphony 387.74

Catalytic

5.1

72 %

10600-49700

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Efel Symphony 390.74	Catalytic	1.8	72 %	10700-33000
Harmony I	Noncatalytic	4.4	63 %	11800-55000
Harmony IIIB	Noncatalytic	2.7	63 %	11,200-57,300
Model S-33,H33,R33,33	Noncatalytic	3.3	63 %	8,600-37,300

Thermic, Inc.
P.O. Box 11986
N. 9510 Newport Highway
Spokane WA99211 ,
USA
509-467-4328

Crossfire FS-1	Pellet	0.5	78 %	6900-39900
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Tianjin Berkeley Furniture Corporation
18400 East Gale Avenue
Berkeley Forge and Foundry
City of Industry CA91748 ,
USA
626-810-0101
<http://www.berkeleyforge.com/>

TR 001	Noncatalytic	4.2	63 %	9200-28300
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Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Tolotti Manufacturing, Inc.

670 Dunn Circle

Sparks NV89431 ,

USA

702-359-5661

Benchmark, 1800; P,I,ZC

Noncatalytic

7.8

63 %

10000-32000

Travis Industries, Inc.

4800 Harbour Point Blvd. SW

Mukilteo WA98275 ,

USA

425-827-9505

<http://www.travisproducts.com/>

Avalon 1000C2

Catalytic

3.5

72 %

7300-47100

Avalon 1196, Lopi 520/96, Flush Bay-96

Noncatalytic

7.4

63 %

11300-43600

Avalon 700

Noncatalytic

5.9

63 %

9200-39100

Avalon 901

Noncatalytic

5.2

63 %

7500-45500

Avalon 996

Noncatalytic

5.5

63 %

9500-45600

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Avalon Cottage/Mission	Noncatalytic	2.9	63 %	11600-36500
Avalon Olympic,Lopi Liberty, Lopi Freedom Bay	Noncatalytic	2.6	63 %	12000-45100
Avalon Pendelton 90/Pendelton 45	Noncatalytic	3.0	63 %	8700-44400
Avalon Rainier 90/Rainier 45	Noncatalytic	2.0	63 %	11200-40000
Fireplace Xtordinair 44 Elite	Catalytic	2.5	72 %	11000-45300
Fireplace Xtordinair Elite 36 Z.C. & B.I.	Catalytic	2.3	72 %	11900-47100
Fireplace Xtordinair Model 36A	Catalytic	4.1	72 %	10300-54700
Flex-95 FL, LX, and FS	Catalytic	4.1	72 %	10900-55300
Flush Wood A Fireplace Insert	Noncatalytic	4.1	63 %	11,300-33,400

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Leyden and Avalon Arbor				
	Noncatalytic	2.4	63 %	10,700-33,900
LOPI 380-96				
	Noncatalytic	5.2	63 %	9400-52800
LOPI ANSWER/LOPI PATRIOT/LOPI PARLOR/LOPI Republic, Model Number 1250 and Avalon Spokane				
	Noncatalytic	4.4	63 %	11600-38500
LOPI Answer/Patriot (Formerly Answer-NT)				
	Noncatalytic	3.3	63 %	12000-41000
Lopi Elan E1, E2				
	Noncatalytic	4.3	63 %	11700-26300
Lopi Elan-96				
	Noncatalytic	7.4	63 %	12000-51400
Lopi Endeavor, Lopi Revere (Formerly 380-NT & X-NT)				
	Noncatalytic	1.9	63 %	9300-42200
Lopi Flawless Performance 380, 440				
	Noncatalytic	7.0	63 %	6900-48700
Lopi Flex FS, FL, LX				
	Catalytic	2.9	72 %	10900-31000

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
LOPI Freedom	Noncatalytic	3.6	63 %	11800-47500
Lopi Premiere Answer Series PA1, PA2, PA3, PA4,PA5	Noncatalytic	7.0	63 %	8000-31500
Lopi Sheffield	Noncatalytic	3.9	63 %	10,300-34,400
Lopi The Answer	Noncatalytic	6.7	63 %	10500-63100
Lopi X Fireplace Insert	Noncatalytic	6.0	63 %	13600-29100
Lopi X/96	Noncatalytic	7.2	63 %	11600-53900
Model 36 F	Catalytic	4.0	72 %	11900-55000
Model 44-A BI and Z.C.	Catalytic	2.3	72 %	10700-75700

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Tri-Fab, Inc.

62880 Peerless Court

Bend OR97701 ,

USA

503-389-0304

SunRise P-48-H, P-48-L

Noncatalytic

5.5

63 %

11700-25800

SunRise P-54 & SunRise PIL-8

Noncatalytic

5.0

63 %

10600-26500

SunRise P56

Noncatalytic

6.2

63 %

10700-39700

Tulikivi Oyj

,

Tulikivi Maxi XV 2

Noncatalytic

4.2

63 %

12,058-38,224

Tulikivi MINI XV 1

Noncatalytic

4.5

63 %

12,100-38,200

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

U.S. Stove Company
227 Industrial Park Drive
South Pittsburg TN37380 ,
USA
(615) 837-2100

<http://www.usstove.com/>

Ashley AFS24, King K3, cat., freestanding/insert

Catalytic 2.6 72 % 10300-34600

Ashley AHS2, AHS2B; King KHS2

Catalytic 1.9 72 % 13700-34300

Ashley C-92

Catalytic 3.0 72 % 11000-36900

Ashley CAHF-2, Atlanta ACF-2, King MCF-2

Catalytic 1.6 72 % 12800-38900

ASHLEY NCA-1/KING KPS

Noncatalytic 7.2 63 % 6500-23200

Bay Insert 4500

Catalytic 3.7 72 % 9600-30700

Clayton Mfg Clay 60B, 70

Catalytic 2.7 72 % 12100-54300

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Wonder Wood 6000, 2821, Sears 143.8404	Catalytic	3.7	72 %	9100-18700
Wonder Wood (Glass Front) 2921, Sears 143.8417	Catalytic	3.3	72 %	12500-54600

United States Stove Company

5500M, 5500XL, 5500XLT	Pellet	1.6	78 %	9,126-27,677
6039, 6039 T, 6039 HF, 6039 TP	Pellet	1.5	78 %	8,528-29,921
APS 1100B	Noncatalytic	5.9	63 %	10,100-25,000

Vestal Manufacturing

P.O. Box 420
 Sweetwater TN37874 ,
 USA
 615-337-6125

Vestal Fireplace Insert V-200-I, V-200-P, V-200-L	Catalytic	2.0	72 %	11700-26500
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Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Vestal Radiant Heater V-100

Catalytic

2.2

72 %

9400-27700

Vogelzang International Incorporated

18400 East Gale Avenue

400 West 17th Street

Holland MI49423 ,

USA

616-396-1911

<http://www.berkeleyforge.com/>

Defender

Noncatalytic

4.2

63 %

9200-28300

Highlander, Shiloh Insert, Model TR003

Noncatalytic

5.8

63 %

9000-26300

Wamsler Herd und Ofen GmbH

Landsberger Strasse 372

D-8000 Munchen 21 ,

Germany

89-589-6243

HOK 10

Noncatalytic

4.6

63 %

9200-16900

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Waterford Stanley Limited

**Bilberry Waterfo ,
Ireland
011-353-51-302300**

<http://www.waterfordstanley.com/>

100B 90 32 RV

Noncatalytic

3.9

63 %

10600-26500

100B 90 32 TV

Noncatalytic

3.1

63 %

10800-32400

100B Design 29

Noncatalytic

7.5

63 %

7200-27500

104 MK II 31

Noncatalytic

2.9

63 %

8800-25900

Ashling

Noncatalytic

4.1

63 %

12000-29800

Erin

Noncatalytic

7.6

63 %

11800-41500

Erin OA

Noncatalytic

4.1

63 %

10400-30300

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Erin/90 TV	Noncatalytic	5.7	63 %	10200-39900
Erin/90 TV	Noncatalytic	4.2	63 %	10500-40900
Model 100B, 100B O.S.A., Leprechaun	Noncatalytic	4.3	63 %	9000-26700
Trinity 35	Noncatalytic	7.0	63 %	11800-39300
Trinity OA	Noncatalytic	4.0	63 %	11500-43800
Webco Industries				
105 East Street				
Woodland CA95695 ,				
USA				
(916) 666-6107				
Marquis 800, 800 XL	Catalytic	3.6	72 %	9900-20000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Weitz & Co., Inc.

1447 E. State St.
P.O. Box 340

Boise ID83616 ,
USA

208-939-8218

<http://www.blazeking.com/>

Briarwood BB, BBI and BBZC

Noncatalytic

4.8

63 %

10600-25300

Briarwood II 87

Noncatalytic

7.3

63 %

9900-45900

Briarwood XE 88

Noncatalytic

6.4

63 %

12800-34200

Eagle 88, Pioneer ZC

Noncatalytic

6.4

63 %

12800-22800

Welenco Manufacturing, Inc.

533 Thain Rd

Lewiston ID83501-553 ,
USA

(208) 743-5525

P-1000W

Pellet

0.7

78 %

9600-23900

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Weso-Aurorahautte GmbH

Pleasant Drive

Ceramic Radiant Heat

Lochmere NH03252 ,

USA

603-524-9663

Prestige 125, 225, 325, 425

Noncatalytic

7.3

63 %

8900-31200

Renaissance 326

Noncatalytic

8.0

63 %

9200-32900

Winrich International

P.O. Box 51

Bristol WI53104 ,

USA

414-857-7800

Winrich Pellet Stove

Pellet

1.6

78 %

8500-27900

Winston Stove Company

13643 Fifth Street

Chino CA91710 ,

USA

909-591-7405

Model WP-18

Pellet

0.6

78 %

10000-21300

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Model WP-24

Pellet

1.5

78 %

9700-29400

Wittus Fire By Design

PO Box120
Pound Ridge, NY 10576

Shaker Stove

Catalytic

7.3

63 %

9,667-29,242

Wolf Steel Ltd.

24 Napoleon Road
Barrie ONL4M 4Y8
Canada
705-721-1212

<http://www.napoleon.on.ca/>

1600C-1

Noncatalytic

7.2

63 %

9,200-33,400

EPA1600C

Noncatalytic

5.4

63 %

12,375-28,127

Napoleon 1000

Noncatalytic

6.5

63 %

10200-30800

Napoleon 1100

Noncatalytic

4.1

63 %

11700-32700

Model Name		Emissions (g/hr)	Efficiency	Heat Output (BTU/hr)
Napoleon 1400	Noncatalytic	3.5	63 %	11500-33600
Napoleon 1500	Noncatalytic	7.0	63 %	11700-23100
Napoleon 1900	Noncatalytic	2.9	63 %	11800-34000
Napoleon 2000	Noncatalytic	3.2	63 %	11000-31100
Napoleon Prestige NZ-26	Noncatalytic	5.4	63 %	11500-27400
BV	Catalytic	3.8	72 %	10800-35400

Wolf's Casual Living
6101 N Blackstone Avenue
Fresno CA93710 ,
USA
559-431-6120

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Woodkiln Inc.

24 Jamestown Street

Sinclairville NY14782 ,

USA

(716) 962-8178

Woodkiln WK-23

Noncatalytic

3.8

63 %

10700-27200

Woodstock Soapstone Company, Inc.

66 Airpark Road

West Lebanon NH03784 ,

USA

603-298-5955

<http://www.woodstocksoapstone.com/>

Catalytic Fairview Soapstone Stove #201

Catalytic

3.5

72 %

13200-40000

Catalytic Fireview Soapstone Stove #205

Catalytic

1.4

72 %

10900-42900

Paladian Model 202 & Model 203

Catalytic

1.9

72 %

8500-35000

Model Name

Emissions
(g/hr)

Efficiency

Heat Output
(BTU/hr)

Yunca Heating

**P.O. Box 932
38 Bowmont Street
Invercargill ,
New Zealand**

Yunca WEGJ E/481

Noncatalytic

5.0

63 %

10700-30300

Zephyr Stoves, Inc.

**2800 Pringle Road SE Ste 130
Salem Oregon, 97302**

888-842-8454

Volcano Plus

Noncatalytic

4.5

63 %

10,700-34,800

Total number of certified stoves:

705

Efficiencies shown are default efficiencies. These stoves have not been laboratory tested for efficiency.

The default efficiencies are: noncatalytic wood heaters - 63%, catalytic wood heaters - 72% and pellet stoves - 78%.

Appendix C
Response to Comments on Draft Rule

Comment #1 (Maureen Killoran):

It's amazing to me that the BAAQMD goes to all this trouble to draft pollution regulation on wood burning devices in people's homes, but completely ignores the popular fire bowls that are marketed at every home and garden center, and are on the cover of every home and garden magazine. It seems to me that if reducing particulate matter and carbon emissions is the goal, then these backyard fire bowls need to be included in the district's legislation. Not including these devices is inconsistent with your intent. Every day needs to be considered "Spare the Air Day".

The fire bowls do not serve an essential purpose like wood burning stoves in homes do (as a source of heat). No, these "campfire bowls" provide atmosphere only, in suburban backyards. It used to be that campfires were only seen in campgrounds, in the great outdoors, with plenty of space for the smoke to mix in and dissipate it. Now, backyard woodsmoke from fire bowls is commonplace every warm night in neighborhood blocks where neighbors have no choice but to breathe it in. These devices have no "second-burn" at all, like many of the stoves that you reject.

I urge the district to consider these unregulated polluters in their wood burning restrictions, for the health of the community, and for the health of the environment.

District Response:

Fires set for recreational purposes using only clean dry wood or charcoal are currently exempt from District regulations. Staff is proposing to amend Regulations 5: Open Burning to regulate the devices mentioned by the commenter. This proposed new standard would curtail the use of these devices when wintertime air quality is forecast to be unhealthy.

Comment #2 (Chris Knight):

Thanks for holding the town hall meetings. I respectfully request the following comments be added to the record; I had stated these in person but would like to re-iterate them here.

1) Lack of enforcement - the proposed regulation, as far as I can tell, lacks any process for investigating violations of this rule and the rule lacks any details on funding and staffing changes necessary to properly enforce the requirements as put forward. While voluntary compliance with a "mandatory" Spare the Air Night is likely to be significantly more than the current voluntary events, the compliance would be far greater if a combination of roving inspectors and a call-in system (a-la the smoking vehicle program). I hope to see some stronger enforcement proposals in the future, particularly for repeat and gross violators.

2) Phase-in of EPA-certified devices - as citizens become more aware of the new regulation, they will be more likely to change out equipment for EPA-certified equipment

if the proposed regulation did not apply to those devices. As we discussed at the San Jose meeting, the regulation could propose a 5-year phase-in of the requirement that exempted EPA-certified devices unless/until it is found that the policy as it applied to non-EPA-certified devices does not particulate matter air quality metrics below the EPA-suggested limit. Phasing in EPA-certified devices would also allow for the BAAQMD to examine the impact of non-EPA devices in isolation and highlight to consumers that there are two classes of devices available on the market, those that are and are not certified. This will also offset some of the concerns from appliance vendors as they will see an increase in business as folks trade-out equipment.

3) Cost modeling of impacts to neighbors and community of particulate matter pollution - As we discussed at the San Jose meeting, I request that the models developed by the BAAQMD for cost-benefit analysis include the cost to citizens who live in areas with high particulate matter. Many citizens, myself included, spend thousands of dollars upgrading windows, doors, insulation, HVAC equipment, and buying expensive filtering equipment in order to reduce the amount of particulate matter in our homes. While you may be already modeling the health impact, there is a significant financial impact as well.

Thanks again for your consideration and, overall, I am very happy to see this change move forward.

District Response:

1) First and foremost, the Air District is going to get the word out to the residents of the Bay Area, through outreach, to inform the public of the adverse health effects of wood smoke and about the requirements of this new regulation. The Air District has sole responsibility to enforce this regulation. The Air District will first provide a warning letter to someone found be in violation of the regulation, explaining how to avoid any violations in the future and why it is important that they do their part to avoid the harmful public health effects of wood smoke. People who follow the advice in the warning letter and change their burning practices should be able to avoid additional violations and a citation. Repeat violators will receive a citation through the mail, followed by enforcement action by the Air District. The District is considering alternatives to monetary penalties, but standard policy for the Air District is to assess penalties for air pollution violations.

Traditionally, investigation processes and funding mechanism are not specified in the rule but are discussed in the draft staff report and CEQA documents, where applicable. However, staff is proposing to include regulatory language that addresses, in part, enforcement procedures. Section 6-3-401 specifies that the District has sole responsibility to enforce the rule. A discussion of enforcement procedures and costs associated with the implementation of the rule are contained in the draft staff report. Additional discussion on costs associated with the rule can be found in the socioeconomic report.

The suggestions for enforcement, roving inspectors and a call-in, are used by the District's Compliance and Enforcement Division staff to perform their normal duties. The District will continue to use these procedures where appropriate, but will not send Inspectors knocking on doors. The District will use the progressive outreach system described above to advise and enforce the rule. The Air District will handle any wood smoke air pollution complains along with the over 3,000 air pollution complains received annually. Each complaint is investigated and the results of the investigation are reported back to the caller.

2) While EPA-certified devices and pellet stoves are designed to pollute less than open-hearth fireplaces or uncertified wood stoves, they still emit fine airborne particulate matter (PM). Therefore, a phase-in of these devices will increase the air pollution on days with already unhealthy air quality as more devices are phased in. Particulate emissions from EPA-certified devices are still at least 10 times higher than natural gas-fueled devices and can also generate excessive smoke if not installed or operated properly. Whenever the Air District forecasts unhealthy air pollution levels it is critical that all unnecessary burning is eliminated in order to meet the EPA fine particulate air quality standard, thereby preventing negative public health impacts on the residents of the Bay Area.

3) The EPA reviewed the health related literature regarding the public health effects of elevate PM_{2.5}. As a result of this review the EPA lowered the National Ambient Air Quality Standard for PM_{2.5}. The adverse public health impact of PM_{2.5} is the reason the Air District has proposed this regulation. At this time, there is insufficient data from individuals who voluntarily spend money to reduce their exposure to particulate matter air pollution as well as the effectiveness of such measures.

Comment # 3 (Katherine Brooks):

I would like to register my concern about outdoor burning and I wonder if there are any projected regulations to control that source of air pollution.

District Response: See District response to comment #1

Comment # 4 (Gayle Rubin)

Having just read the draft report on the proposed regulations, I am confused about how these regulations pertain to EPA Phase II certified wood stoves with catalytic converters to control emissions. Assuming these are in well maintained working order, would their use be prohibited or not? It seems to me they should be exempt from these prohibitions as they are not comparable to regular fireplaces with no such emission control. Please clarify the status of such EPA certified devices, and record my strong opinion that such devices in good working order should be exempted.

District Response:

While EPA-certified devices, those with and without catalytic converters, and pellet stoves are designed to pollute less than open-hearth fireplaces or uncertified wood stoves, they still emit fine airborne particulate matter (PM) which increases the air pollution on days with already unhealthy air quality. Particulate emissions from EPA-certified devices are still at least 10 times higher than natural gas-fueled devices and can also generate excessive smoke if not installed or operated properly. Whenever the Air District forecasts unhealthy air pollution levels it is critical that all unnecessary burning is limited in order to meet the EPA PM_{2.5} standards, thereby preventing negative public health impacts on the residents of the Bay Area.

Comment # 6 (Bob Moore):

I would like to suggest that the air board fine people who drive their cars on days like today. This should have been a Spare the Air day. 100% of the PM 2.5 and Ozone was caused by the burning of petroleum products and the BAAQMD needs to do something about this. The BAAQMD has no problem restricting wood burning but when it comes to petroleum burning nothing is done. Makes me wonder whose pocket the BAAQMD is in. Today will be the first of many horrible air days this summer caused by burning petroleum products.

District Response:

Emissions from cars, trucks and other mobile sources are regulated at the State level by the California Air Resources Board. The District has developed programs to reduce emissions from vehicles where allowed by law; one to report smoking vehicles that emit excessive pollution and the second is the Spare the Air program which encourage public transit use and reduced petroleum consumption. Both programs have a strong public outreach component, which was considered and used in the development of the proposed new wood-burning device rule.

Emissions from burning in fireplaces and stoves are the largest source of winter PM in the Bay Area that is currently not regulated. The Air District cannot meet the recently lowered EPA ambient air standard for fine particulate to protect public health unless emissions from fireplaces and woodstoves are also reduced.

Comment # 5 (Mona Wright):

I live next door to neighbors who burn wood all winter in their fireplace. They use it to heat their home. I have asthma and allergies, and the days that they burn I have problems breathing. These new regulations are not enough for my health.

District Response:

While the mandatory curtailment component of the proposed regulation is focused on reducing the impact of woodsmoke on public health when fine particulate levels are at unhealthy concentrations, other components of the regulation such as the visible emission standard will apply all year. This requirement will result in cleaner burning and less PM air pollution. The Air District will increase efforts to inform the public of the adverse health effects of wood smoke and explore other incentives such as the recent change-out program offered to residents to upgrade to clean-burning devices to further reduce air pollution from woodsmoke.

Comment # 7 (Laura Wuest):

I live in La Honda in a community of mostly all historic buildings, classic log cabins that date back to almost 100 years ago. Many of us have only one source of heat, that is wood. I heard there are hearings coming up soon. I thought we would always be exempt if our sole source of heat is wood. There aren't that many of us. Are you telling me I should start being concerned the government is thinking of taking away our only source of heat?

District Response:

Households whose only source of space heat comes from a wood burning device would be exempt from the proposed curtailment standard. The proposed rule does not have any provision that would allow the District to take away wood burning devices.

In an effort to protect public health by reducing fine particulate air pollution from wood burning devices, the proposed rule would require cleaner burning technologies in new installations. Existing households will not need to be retrofitted. There are restrictions on the amount of smoke that may be emitted from wood-burning devices. Excessive smoke is an indication that the wood burning is not occurring as efficiently as it should. This excessive smoke may be due to wet wood or not enough air to maintain a hot fire or some other malfunction. People should follow manufacturer's recommendations for proper installation and use of wood burning devices.

Comment # 8 (Michael Schwab):

After looking at how this issue has evolved over many months, I am deeply disturbed at what has been included in the draft proposal. The Bay Area has some of the smartest, most environmentally sensitive people in the United States, yet somehow BAAQMD thinks the only way to achieve reduced emissions from regular wood is to expand the scope of government, monitor the output from fireplaces and chimneys on bad air days, create environmental police, and impose fines. It's the completely wrong approach and those who are promoting it should be ashamed.

The solution to the air quality issue should come through good old-fashioned common sense. The government should promote rebates for fuel-inserts and make citizens aware of the problem with burning wood, especially on bad air days. It's that simple. Do those steps and you can [come] to a solution faster and cheaper, and most importantly, without restricting liberty. Liberty and independence are two of our most cherished values, and if you trample on those values to promote clearer air and environmentalism rather than educating the public and encouraging behavior, I hope the public revolts and works to undermine your efforts at every turn. BAAQMD can do far, far better, and should go back to the drawing board to put the focus on education and low-cost tools to solve the problem rather than excessive government intervention.

District Response:

The Air District has promoted a voluntary burn restriction through the Spare the Air Tonight program since 1991. However, this approach has only had limited success in reducing fine particulate. The Air District agrees that incentives are an important tool to inform people of the negative health impacts from fine particulates in wood smoke and encourage residents to switch to clean-burning hearth products. This winter the Air District had two rounds of incentive programs with total funding of \$500,000. While these measures reduced over 12.5 tons of fine particulate matter and are important to assist the Air District in its efforts of reducing contributions to fine airborne particulate matter from wood smoke, it has not been enough to meet strict EPA air quality standards and protect public health. The Air District believes the mandatory curtailment component of the proposed rule is the most effective tool to prevent PM_{2.5} levels from reaching unhealthy levels. Other air districts within the state and other states have implemented similar strategies and have seen significant improvements in air quality.

Public education and outreach will continue to be emphasized as primary Air District programs to reduce elevated levels of fine particulate matter. The proposed regulation is necessary to reduce the contribution from woodsmoke to fine airborne particulate pollution, improve public health, and meet EPA ambient air quality standards for fine particulate matter.

Comment # 9 (Judith Serin):

I strongly support any regulations that will limit or prohibit wood burning due to the health problems that it causes. Thank you--

District Response: Your comment has been noted.

Comment # 10 (Ruth Waldhauer):

The day the Summit Fire began was very windy. Winds were from the east and dry, dry, dry. BAAQMD nonetheless announced it to be a "burn day". How wrong!!! Anyone with common sense would never do a burn on such a day.

This is another example of how off base BAAQMD is.

The proposed Regulation 6, Rule 3: Wood-Burning Devices is deeply flawed.

BAAQMD district should be abolished. Government funds would be better spent on education.

District Response:

Open burning refers to outdoor fires that occur in the open without an enclosure or flue. Open burning is generally prohibited with the exception of certain fire types allowed by Regulation 5: Open Burning. Most allowable fires are limited to "burn" days. The Air District designates each day of the year as either a "burn" or "no burn" day based on meteorological standards established by the California Air Resource Board. These standards include requirements for expected daytime wind velocity, temperature, and atmospheric stability. "Burn" days are approved only if particulate matter concentrations are safe and weather conditions will keep smoke from creating unhealthy conditions for the general public. The proposed regulation does not affect the burn day status forecasting process. The proposed regulation is focused on reducing the impact of woodsmoke from fireplaces and woodstoves on public health when fine particulate levels are at unhealthy concentrations in the wintertime.

The District regulates open burns to manage various types of fires that have been determined to be beneficial. The District uses various tools to determine the amount of allowable fires that may occur within the Bay Area without causing or creating a potential to exceed the national air quality standard for particulate matter. The focus is not on fire risk during high winds. The District considers wind speed and prohibits setting of allowable fires when wind speeds are less than 5 miles per hour. It is these stagnant conditions that contribute most to unhealthy air and are the focus of the proposed requirement for wintertime curtailment on days forecast to be in excess of the national ambient air quality health based standard.

The proposed regulation is similar to other air pollution agency's rules which have been proven to reduce fine particulate air pollution from wood-burning devices. The proposed rule is an appropriate measure for reducing the contribution to fine airborne particulate levels from woodsmoke in the Bay Area during winter months.

Comment # 11 (Peter M. Pollock, Susan H. Pollock):

A few days ago I heard a radio interview with a BAAQMD staffer enthusing over how clean our air was by the recent assessment. He was right. It is very clean.

How clean is "clean enough?" How much are we to sacrifice in comfort and wellbeing, including aesthetics, to the God of Ultimate Purity? Should not the moving of decimal places end somewhere? (Keeping in mind that the acolytes of the God - the environmental bureaucrats whose jobs will vanish once "clean enough" is reached -will always claim the next decimal is required.)

I like my fireplace. My neighbor likes his BBQ. They do my soul good, as does the wonderful smell of the woodsmoke from them or those of other neighbors. Have you made the least attempt to put a value - including to mental health, lessened stress, etc. - on our fireplaces? I have no doubt that this value has never occurred to you- too hard to quantify.

You can count specs of soot in a filter and plug the number into a computer model, getting something you can point at as a quantity (but in reality entirely meaningless at the low levels we have reached, well below the margin of error, dwarfed by other elements). How about attending to other aspects of health no less real?

Please also consider our mental -including aesthetic- health. The sterile world you are pushing to create would be much less healthy than the one we have now. Fireplaces and backyard BBQs do us far more good than any putative small health effect from their emissions.

District Response:

Fires and fireplaces are not being banned and you can still enjoy your fireplace when the air quality is not unhealthy. When the air quality is unhealthy, however, the burning of wood or other solid fuels will be prohibited. However, even when air quality is unhealthy from elevated levels of fine particulate pollution you will still be able to enjoy a gas fueled fireplace. Barbecue activities will not be affected by the proposed regulation and are not prohibited by the Air District.

Comment # 12 (Kevin Carley):

On Tuesday, April 29, 2008 in San Jose City Hall, the Air District had a public information meeting to propose regulation 6-3 concerning wood-burning devices. The meeting started with a very informative power point presentation describing the problem with particulate matter caused by wood smoke. I thought Eric Pop did an excellent job explaining the difference issues that were brought up, and he answered the meeting attendee's questions very well. I feel that the proposed regulation sounded good but it

seems even more actions can be taken to improve our air quality than those addressed for the few selected “spare the air tonight,” nights that occur during the year.

Yes, this is a good step in the right direction but more should be done. With the proposed regulation more monitoring, using devices like the Ambient PM_{2.5}, should be used to give a more accurate readings of air quality in our cities. The public can now sign up to be on an e-mail list to be notified if there is a “spare the air tonight” in affect. Has the district considered other passive ways to get the word out? A passive notification method will ensure that citizens are made aware of unhealthy evenings, without the need to log in and look for an e-mail message, before starting a fire in their fireplaces and other wood-burning devices. Text messaging was mentioned in the presentation, but many people block text messages from their phones, or have to pay for each message, which makes this method only marginally helpful.

I also see enforcement of this proposed regulation to be a real headache. I doubt that drive-by neighborhood audits and enforcement will be effectively and fairly applied throughout the effected cities. This is logistically problematic, and the resources just won't be available to enforce this regulation properly and fairly. The district's proposed first step, as described in the meeting, was to present “warnings” to individuals when found in violation for the first time. Following this first warning, the individual would then be fined in the future should they be found in violation again. In addition to my doubts on whether enforcement can be applied uniformly throughout our cities, I also feel that a fine for the second violation is a weak incentive to change violator's behavior. The odds of getting caught in the first place are very slim, couple this with the enormous size and difficulty of the audit enforcement process, it may still be worth the risk of this fine for some violators to continue their bad burning behavior. This has clearly been seen before in our carpool lanes. People make judgments as to whether the fine is worth the risk compared to the time they reduce in their daily commutes, and often decide to continue to violate the carpool regulations. After years of this cheating behavior, traffic enforcement officials then beefed up their incentive program by “doubling” fines for each repeating offense. This solution seemed to work for daily daytime commuter violations, but the enforcement of this proposed spare the air tonight regulation will be much more difficult to oversee than the carpool program.

I strongly feel that this proposed regulation on wood burning is not really realistic, from and enforcement standpoint. It is truly a step in the right direction but needs to have a more realistic enforcement policy with bigger teeth for those that violate the community's health standards. Overall a think BAAQMD in on the right trace but needs to make more changes faster if they really want to make a difference in our air quality. Pollution, Greenhouse gases, and Global Warming in general are in our newspapers and on TV daily. These subjects are entering the public's awareness and are becoming part of our lives as the word is finally getting out. I believe that this issue of the management of wood-burning devices within our cities is similar to these larger issues and therefore it needs to be integrated in our cities' and nation's overall response to this severe and worsening situation.

District Response:

First and foremost, the Air District is going to get the word out to the residents of the Bay Area, through public outreach, to inform the public of the adverse health effects of wood smoke and about the requirements of this new regulation. The proposed new rule has identified various ways to inform and educate including providing a link to the District's web site and list-server. Staff is proposing additional methods for those without internet access, including media outlets – radio, television and news print.

Also see district response to comment #2.

Comment # 13 (Stanton Klose):

I didn't search exhaustively, but I don't see anything about enforcement mechanisms. Where should I be looking? Thanks.

I continue to be surprised that public hearings such as this one are scheduled during working hours. This is a convenience to the Board, no doubt, but it limits attendees to retirees, the unemployed and people with flexible work hours.

District Response:

A discussion of enforcement mechanisms is in the draft staff report and is briefly described above in comment # 2.

The District is mindful of scheduling and during the development of the proposed rule held extensive meetings throughout the Bay Area during the day and in the evening hours. The District will make available on our web site or by request all documents and comments processed during the public hearing on July 9th.

Comment # 14 (Stanton Klose)

Dear BAAQMD Board of Directors,

I'm writing in general terms to encourage you to enact any measures you deem necessary to ensure that fireplaces and other wood burning devices in urban areas do not affect the health or well being of any citizen. It seems to me that the current process of regulating urban wood smoke is similar to the decades-long effort to control cigarette smoke.

When I was a child, smokers lit up on buses and airplane and in theatres and college classrooms. My pediatrician smoked in his exam room. In the intervening generation or two, the public's understanding of the risks of both direct and second hand smoke has become universal, and attitudes toward smoking have changed fundamentally.

When I was a child, my family cooked over an open campfire at our beachfront vacation property. Until twenty or so years ago, I built small campfires when I backpacked in the High Sierra. My mother (who lived in a rural area) heated her house principally with a Franklin Stove until her death at 84. I know, perhaps better than many people, the fundamental pleasure of sitting in front of a fire on a chilly evening and watching the wood burn to embers.

I now live in Terra Linda in Marin County. Several of my neighbors often use their fireplaces during the fall and winter when the evening temperature drops into the forties. There is typically little or no wind at these times, so stale smoke drifts around the neighborhood, hanging in the air and contributing to the haze that, unfortunately, soon forms after a storm clears the air. Apart from these annoyances, we now know that "second hand" smoke from fireplaces is a significant health hazard.

My neighbor's right to sit in front of a crackling fire must be weighed against my right to crack open my bedroom window at night for a bit of fresh air, or to take a run without breathing polluted air, or to hike up Mt. Tamalpais to see if the Sierra Crest is visible after a winter storm.

Someday, perhaps, people with fireplaces will be able to equip them with scrubbers that allow them their enjoyment without diminishing mine. In the meantime, it's important to acknowledge that we no longer live in Little Houses on the Prairie where our neighbors are miles away.

Please vote in favor of the proposed wood burning regulation.
Thank you so very much for your support!

District Response: Your comment has been noted.

Comment # 15 (Susan Frank)

Dear Supervisor Kniss and Council Member Kishimoto,

I urge the BAAQMD Board's adoption of a strong wood smoke regulation. I live in a community in Mountain View where wood smoke is particularly an issue – an immediate neighbor burns almost year round (including burning trash, food products and in the past pressed wood) causing significant breathing issues for another neighbor with asthma. Given air quality issues throughout the Bay Area, I believe it is critical to adopt a regulation that is the strongest possible to protect public health.

Thank you for your consideration.

District Response: Your comment has been noted.

Comment # 16 (Al Sekela)

Dear Supervisor Smith,

I'm a resident of Santa Rosa and have been following the public discussions held by the Bay Area Air Quality Management District concerning proposed regulations of wood burning.

I support the proposed regulations, and wish they were stronger. I do not have lung disease, but there are times when my neighbor's wood smoke causes me severe distress. These depend on local air movement, and are not always on days when the proposed regulations would ban burning. However, the proposed regulations are a good start.

District Response: Your comment has been noted.

Comment # 17 (Patricia Briskin)

Jerry,

I have followed this issue carefully and sent you numerous emails in the last few months. I fully support this regulation, without any dilution. In fact, I would support a total ban on all wood burning smoke, as it contributes to air pollution, and is a health hazard as well as carcinogen.

I urge you to lead in voting for this regulation, and continuing regulation and eventual banning of all woodburning, whether by fireplace, stove, or outdoor firepit. The bay area is now a dense population center, with the potential to harm the health and welfare of our citizens.

I voted for you at the recent election, and expect you to continue fighting sources of health hazards, such as wood burning smoke.

District Response: Your comment has been noted.

Comment # 18 (Giel Witt):

I would like to comment on Rule 6. I attended your informational meeting in Santa Rosa and after hearing your presentation, I would like to go on record as being against this regulation. I believe it does not take into account the advances made in wood stove clean burning technology. During the current oil crisis, we need good alternatives to wean America off of petroleum. Rule 6 will take us in the opposite direction.

District Response:

While EPA-certified devices and pellet stoves are designed to pollute less than open-hearth fireplaces or uncertified wood stoves, they still emit fine airborne particulate matter (PM) which increases the air pollution on days with already unhealthy air quality (approximately 10 to 20 days per winter season). Particulate emissions from EPA-certified devices are still at least 10 times higher than natural gas-fueled devices and can also generate excessive smoke if not installed or operated properly. Whenever the Air District forecasts unhealthy air pollution levels it is critical that all unnecessary burning is limited in order to meet the EPA ambient air quality standards, thereby preventing negative public health impacts on the residents of the Bay Area. When air quality is good residents can use their woodstove for heating.

Comment # 19 (Judith Bruno):

Dear Supervisor Wagenknecht,

The Napa County Asthma Coalition (NCAC) is writing to encourage your strong support of proposed regulations by the Bay Area Air Quality Management District to control wood smoke pollution (Regulation 6, Rule 3). Our newly formed coalition has identified particle pollution from wood burning as a leading air quality issue in Napa County. It is well documented that particulate matter pollution from wood burning can adversely affect lung function and is a health hazard for those with asthma and other respiratory diseases.

In addition to particulate matter, wood smoke contains components such as carbon monoxide; various irritant gases such as nitrogen dioxide, sulfur dioxide, hydrochloric acid and formaldehyde; and carcinogens such as polycyclic aromatic hydrocarbons (PAHs) and dioxin.

These particles are small enough to bypass the body's defense system and lodge deep in the lung where they can damage cells and lung tissue. The elderly, children and those with lung and heart disease are at greatest risk.

Asthma is the leading chronic illness in Napa County among children. Napa County has the second highest asthma prevalence rates in California. It only takes a few neighbors using their fireplaces and woodstoves on calm winter nights to cause air pollution concentrations that can result in asthma attacks, hospital visits and missed school and work days.

For all the above reasons, we encourage you to support the air district regulation. This regulation is long overdue and will help protect the health of our community. We thank you for your past support of efforts to reduce wood smoke pollution and urge you to vote yes on July 9 when this matter comes before your board.

District Response: Your comment has been noted.

Comment # 20 (Rachel Hunter):

I'm writing to encourage you to support proposed wood burning regulations. as a health care professional who have been personally affected by air quality issues (we moved here from Washington, DC partly for better air quality only to discover we can't leave the house in the winter due to TERRIBLE smoke levels). my father also has compromised lung function due to years of wood smoke exposure who cannot visit us in the winter since it even comes in through the sealed house enough to irritate him. yes, wood smoke puts more than just particle in our air. it is a known carcinogen which also contains dangerous gases and very fine particulate that can actually penetrate building envelopes and even contaminate indoor air quality. although people associate wood burning with cozy memories and healthy life-styles, it is actually a major health concern. we're seriously considering moving because of the serious nature of this problem for us.

we also have serious concerns about enforcement even if these regulations pass. this past season, even on no burn days our air was filled with smoke and there was no enforcement and not enough public awareness of the regulations.

please help us create a healthy environment for our 2 year old (asthma rates are directly related to particulate and exhaust levels in the air) as a place our whole family can finally settle and feel safe.

District Response: Your comment has been noted.

Comment # 21 (Carol Evans):

I support this regulation. In fact, I think wood burning should be banned outright. It's a health and environmental hazard.

Neighbors on my street burn wood frequently during the winter, forcing me to breath their smoke. These people have children and/or have senior neighbors in fragile health and subject them to this too. Maybe they know not what they do, but the Board members do, and they can do something about it.

I think that it's wrong to have the public hearing (or any public hearing) during working hours. This is anti-democratic in its exclusion. I'm beyond disappointed that I cannot attend, especially since even this limited regulatory proposal has been in process for far too long.

District Response: Your comment has been noted.

Comment # 22 (Craig Harrison):

Why the prohibition on burning wood pallets?

We have burned a few some years ago after we built our home because they were left over from construction activities. We converted something that otherwise would have gone to a landfill site into fuel. They seem like regular wood.

Please educate me.

District Response:

The proposed rule does prohibit use of treated wood or contaminated wood pallets due to the hazardous byproducts of combustion that are released into the atmosphere when burning these materials. The proposed regulation does not prohibit the burning of clean dry pallet wood, except for those days forecast to be in excess of the national ambient air quality based standard for particulate matter. Owners of wood-burning devices should follow manufacturer's recommendation for the appropriate fuel for their device. For instance, pallet wood is typically kiln dried and may combust too quickly for use as firewood.

Comment # 23 (Craig Harrison):

Thank you for this.

If Santa Rosa's highest 24-hr average for PM_{2.5} in 2006 was 59, how could there be a federal exceedance when the federal standard for a 24-hr average is 150?

District Response:

The national ambient air quality standard (NAAQS) for fine particulate matter (particulate matter less than 2.5 microns in size) is expressed in micrograms per cubic meter, and has recently been lowered to 35 micrograms per cubic meter for a twenty-four hour average; Santa Rosa's highest 24-hr average for PM_{2.5} in 2006 was 59.

The value of 150 corresponds to the category for unhealthy for sensitive groups on the Air Quality Index (AQI) scale, which is different than the federal ambient air quality standards. The AQI numbers refer to specific amounts of pollution in the air. It's based on the federal air quality standards for six major pollutants - ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and two sizes of particulate matter. The index is from 0-500 ranking the air quality into general categories ranging from "Good" to "Hazardous". The proposed regulation uses the particulate matter NAAQS as a threshold for curtailment which is 35 micrograms per cubic meter.

In most cases, the federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, it can be unhealthy for the public. When the Air District prepares its daily AQI forecast, we take the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and post the highest AQI number for each reporting zone. Readings below 100 on the AQI scale should not affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States, and readings above 200 have not occurred in the Bay Area in decades, despite recent wildfires.

Comment # 24 (Kathy Voss-Jensen & Joel Jensen):

Dear Members of the Board of Directors of the Bay Area Air Quality Management District:

- Mayor Yoriko Kishimoto,
- Supervisor Jerry Hill,
- Mayor Pamela Torliatt, and
- Supervisor Brad Wagenknecht,

We are writing to urge you to adopt the strictest limitations possible on woodsmoke produced by residential fireplaces and woodstoves. The fine particles produced by woodburning are a serious health hazard, especially to those among us who have heart and lung diseases. No one should be allowed to pollute the air we all breathe with such noxious materials, especially when the negative health impact is well documented, and when so many other means of home heating are available to all residents of the San Francisco Bay area.

Please do all you can to limit woodsmoke pollution in the Bay Area, including:

- (a) 24 hour enforcement of woodburning prohibition on "Spare the Air" days, with hefty fines that increase with each offense, and
- (b) Prohibition of excessively smokey fires (due to poor woodburning technique) throughout the year.

District Response:

The District will continue to strive to protect public health through measures such as this proposed, new regulation intended to reduce fine particulate air pollution. The proposed rule contains language that would prohibit the use of wood-burning devices on days forecast to be unhealthy air quality, and a prohibition of excessive smoke from any wood-burning devices at all times.

Comment # 25 (Rainer Richter):

I am concerned about the effects of section 6-3-112, which allows an exemption for sole source heaters. If I disable my primary heater in some manner, then I no longer have a "functioning space heater" and would therefore be exempt from the regulation. What if my pilot light is not on yet? would that also be considered non functioning?

There should only be exemptions for temporary periods. Either due to a lack of power or gas, as already stated, or for some fixed period, 7 days, which would enable someone to get a furnace repaired. There should be no allowance for any structures with no primary sources of heat other than wood. These will be the gross polluters, burning lots of wood 24/7 to keep warm. They will contribute much more pollution than people with a fire one evening on a weekend.

There should also be some disincentive on fireplaces versus wood burning stoves. Maybe staged curtailments where fireplaces are not allowed but stoves etc. are. It's great that new fireplaces are banned but there should be more incentive for owners of existing ones to retrofit inserts as I have done.

Thanks for keeping the air clean!

District Response:

The Air District revised the sole source of heat exemption to be more specific. In order to qualify for the "Only Source of Space Heat" limited exemption to curtailment, a person must not have any other means of heating that is permanently affixed to the structure. Portable electric space heaters do not meet this definition of another means of heating because they are not permanently affixed to the structure. A person claiming this exemption must be able to provide, upon request, documentation to the Air District stating whether the "Only Source of Space Heat" is temporary or permanent. There is an exemption for "Natural Gas Service Unavailability", for persons who operate a wood-burning device in an area where natural gas service is not available. Unavailability of natural gas service will be determined by the utility provider. In addition, Regulation 1, Section 104: Circumvention Not Permitted, prohibits any person from undertaking any practice intended or designed to evade or circumvent District rules or regulations.

Comment # 26 (Bill Bozym):

Section 6-3-112 states "A person claiming this exemption cannot have use of another form of functioning space heating". There is usually an electrical outlet available somewhere. Does this exemption assume you have no electricity and cannot use an electric heater? How is "only source of heat for residential space" defined?

District Response: See response to comment #25.

Comment # 27 (Craig Harrison):

I appreciate receiving a fair amount of background information on this rule from Mr. Eric Pop. Most of it was not available when the rule was originally proposed, such as “Sources of Bay Area Fine particles” by David Fairley (April 2008). This seems a case of Alice in Wonderland’s “sentence first - -verdict afterward.” Since the premise of the rulemaking is a concern that EPA might designate some or all counties in the BAQMD as nonattainment, I should think that the public and the board would want the Workshop Report justifying the rule to contain a map showing exactly where are all PM2.5 monitors located, which monitors have registered exceedances, and when those exceedances occurred. In addition, the public and decision makers would want an explanation of whether the entire BAAQMD must be deemed attainment or nonattainment, or whether such designations are done on a county-by county basis (which I believe is the approach in the federal Clean Air Act). For these reasons, I do not believe that this rulemaking has not complied with the California Administrative Procedure Act, Government Code §§ 11340 et. seq. You propose to interfere with the daily activities of ordinary people to keep warm in their homes during winter cold spells, and should explain all of these issues carefully and fully in your justification documents.

District Response:

A District monitoring map has been included in the appendix of the Staff Report and is also available on the Air District’s website.

Attainment designations in California are given for individual air districts, which may be composed of one or many counties. The Bay Area District’s jurisdiction encompasses all of seven counties - Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara and Napa, and portions of two others - southwestern Solano and southern Sonoma. For more information on the criteria used to designate attainment see <http://www.epa.gov/air/urbanair/designations.html>.

Staff believes that the proposed rule is supported by the factual record. All documents associated with the development of this proposed new rule are a matter of public record and many are available on the District’s web site. Additional information regarding public records available from the District may be found on the District’s web site; www.baaqmd.gov.

The decision to designate a curtailment period for the winter months on days when air quality is unhealthy as district wide or smaller ‘curtailment zones’ was evaluated. After modeling the behavior of wintertime fine airborne particulate, it was determined that fine particulate air pollution from wood-burning devices is regional and does not stay where it is emitted. Therefore, a district wide curtailment is necessary in the proposed regulation. There are exemptions from the curtailment standard of the proposed rule so that individuals dependent upon wood burning for heat will not be negatively impacted.

Comment # 28 (Craig Harrison):

I have found little data or explanation to justify regulating wood smoke in southern Sonoma County. My previous comments suggested regulating on a county or city basis, but since I really only care about the county where I and my extended family live, I will focus on southern Sonoma County. At this time I know of but a single instance of a PM2.5 exceedance in Sonoma County in 2006 and none from 2002-2005. This type of minor infraction can and should be handled locally, not regionally. The recent report by the American Lung Association, "State of the Air 2008" on page 65 states that from 2004 to 2006 in Sonoma County there were no high ozone days (rating an "A" grade) and a single "orange" PM exceedance (rating a "B" Bay Area Quality Management District June 20, 2008 grade) (Enclosure). There were no "red" or "purple" PM2.5 days, which are worse than "orange" days. There is nothing in the record to indicate that regulating Sonoma County will improve the quality of air in any other county. The prevailing winds blow from the southwest to the northeast. Thus any PM2.5 from Sonoma County would blow into Lake County, where the air quality for PM2.5 is listed as one of the cleanest counties in the nation for both 24-hour and annual PM2.5 (Table 6, State of the Air 2008). Sonoma County cannot possibly cause or contribute to problems in the remainder of the BAAQMD because the prevailing winds do not blow in that direction and the entire premise of the regulation is that the air is still and does not move in the episode of high PM2.5.

Thus I remain skeptical that a BAAQMD-wide policy is warranted, let alone necessary, with respect to Sonoma County. The proposed rule does not seem to be technically justified and including Sonoma County does not seem to have any reasonable prospect of curing any PM2.5 exceedances of the National Ambient Air Quality Standards.

Why is there no report on how smoke or PM2.5 is transported in the BAAQMD? As I discussed in my December letter, the contribution of wood smoke to PM2.5 exceedances is very localized and the problems in Santa Clara County (39 orange days for PM, resulting in a "F" grade) and Contra Costa County -- huge distances away -- are unrelated to wood smoke in Sonoma County.

This proposal seems to be another example of an agency over-reaching its regulatory authority. A more rational approach would be to apply your rule to Santa Clara County and Contra Costa County for a few years and see if any further regulation is needed. The entire Bay Area Basin is not a single homogenous air mass, yet this assumption underlies your entire approach. Indeed, your revised proposal is worse than the original in that you have extended the period during which you can ban fires by an additional 30 days.

District Response: See response to Comment #27.

Comment # 29 (Craig Harrison):

New Diesel Rule May Solve PM2.5 Problems

In my December letter I noted that on-road vehicles account for 23% of the PM2.5 emissions in this area (original Workshop Report, p. 9) and that better regulation of diesel-fueled vehicles seems a better regulatory approach. On May 13, 2008, the California Air Resources Board proposed new rules along these lines. The trucking industry will be required to retrofit and replace 300,000 diesel trucks and buses as part of a campaign to cut diesel particulate matter emissions. The rule would make truckers retrofit pre-2007 models with soot filters and gradually replace all trucks with newer models beginning in 2012. It seems to me that this regulatory initiative may well solve the PM2.5 problem without any need to dictate to people when they can warm themselves with a wood fire in their own homes.

District Response:

The District strongly supports recently promulgated diesel regulations by the California Air Resources Board. These reductions will go a long way in protecting public health especially for those most impacted by diesel emissions, along freeways and close to ports. During wintertime when the air is unhealthy, wood smoke contributes up to 33% of fine airborne particulate matter. The District anticipates that it cannot achieve attainment with the recently lowered national ambient air quality public health standard for fine particulate without the proposed, new rule for wood-burning devices.

Comment # 30 (Craig Harrison):

Definition of “Garbage”

The proposed rule defines “garbage” in 6-3-206 as follows: Any solid, semisolid, or liquid waste generated from residential, commercial, and industrial sources, including trash, refuse, rubbish, industrial wastes, asphaltic products, manure, vegetable or animal solid or semisolid wastes, and other discarded solid or semisolid wastes. I agree that no one should burn “garbage” in a fireplace, but the proposed definition is overly broad. As the saying goes, “one man’s trash is another man’s treasure.” Most anyone has to use kindling to get a fire started, and newspaper, discarded stationary, cardboard, small pieces of wood from a home construction project and many other items are appropriate kindling. Under your definition, these might be “illegal.” They are surely “solid” and “residential,” and to some they might be deemed to be “wastes.” I suggest that you provide some reasonable latitude for kindling. I am concerned that no one on staff who worked on this proposed rule actually has much experience with wood fireplaces.

District Response:

The definition of garbage specifies materials that are not appropriate for burning by a reasonable person. If a material is appropriate for kindling then it is not garbage. Specifically, clean, dry scrap wood and newspaper are appropriate for starting a fire.

Cardboard and windowed envelopes contain adhesives and plastics which should not be burned.

Comment # 31 (Craig Harrison):

I request a copy of any response to comments document that the BAAQMD prepares. I would hope that this document is available to the public and to BAAQMD board of directors well before the District Directors consider adopting this rule (presumably on July 9, 2008). I don't understand how any defensible rulemaking could entail a decision making process where the decision makers have not had an opportunity to reflect on the comments that have been raised and the responses to those comments. For example, the latest staff report notes that subdividing the district was brought up repeatedly and rejected without explaining why this approach was rejected. I am keenly interested in that explanation.

District Response:

There has been extensive public outreach in developing this rule; 16 workshops and informational meetings were held where the public was given opportunities to comment and hear the District's explanations and intent of the rule. In addition to these meetings, staff reported to eight various district governing board committees on several occasions with the purpose of communicating the comments that had been heard at the numerous public meetings and the public's concerns about the proposed, new rule. The public's comments and staff's responses are included in the staff report which is submitted to the District's Board of Directors prior to the public hearing to consider adoption of the rule.

Comment # 32 (Susan K. Goldsborough):

We write today to comment upon the proposed Bay Area Air Quality Management District Regulation 6, Rule 3 to help control particulate matter and visible emissions from wood-burning devices.

Families for Clean Air is a Marin County based organization working to protect the public's health from the harmful effects of air pollution. The negative health consequences of residential wood combustion have been extensively documented in the scientific and medical literature, so we will refrain from repeating that information in these comments.

Our organization and its membership are in support of the rule as presented at the most recent round of public workshops. If anything, we think there are several areas where the current rule should go farther in protecting the public's health from the hazards of residential wood burning.

Despite the efforts of the hearth products industry to manufacture controversy surrounding this rule, the public has clearly shown its support for this rule as presented.

While the hearth products industry has lobbied for exemptions from the mandatory curtailment provision of this rule for EPA certified wood stoves, we believe that granting these exemptions would be detrimental to the public's health. EPA certified wood stoves produce hundreds of times more particulate pollution than heaters that burn natural gas. In addition, the stated performance of EPA certified wood stoves has been shown to degrade with use to the point where their particulate emissions are comparable to non-certified wood stoves. (Source: Environmental Protection Agency, Long-Term Performance of EPA- Certified Phase 2 Woodstoves, December 2000.)

Also at issue is the fact that residential wood burning is the second largest source of dioxin in the Bay Area (Source: BAAQMD, Air Emissions of Dioxin in the Bay Area, 1996.) EPA Certified wood burning appliances have been found to emit amounts of dioxin and furan that are equal to, or even greater, than that emitted by conventional devices (Source: Environmental Protection Branch, Environment Canada, Impact of Residential Wood Stove Replacement on Air Emissions in Canada, 2005.) We can think of no logical reason why the BAAQMD would exempt EPA certified wood stoves from the curtailment provisions of Regulation 6, Rule 3.

We thank the staff and board of the Bay Area Air Quality Management District for all of your efforts in developing this long-overdue, well-reasoned and necessary rule-- and urge its adoption and implementation as quickly as possible.

District Response: See response to comment #18.

Comment # 33 (Christine Anastasi):

I urge you to vote for this minimal ban on wood burning on Spare the Air Days. I am really shocked that anyone would even hesitate to give up burning fires on so few days. It speaks to the burners mentality that they are going to burn no matter who it hurts. There may be people who are ignorant of the ill effects and the BAAQMD and the media has to do a better job of publicizing the facts. Your pamphlet Reducing Wood Smoke is excellent and I am sharing the information with friends and family.

My mother and I were finally driven out of her home because of a neighbor's, and former friend, constant wood burning extending into the spring. I couldn't smell the smoke for a long time but I was coughing at night thinking it was allergies and my mother, a heart patient, was coughing all the time. Finally, the air became acrid and I said we couldn't stay any longer. We moved back to my home which is in the same neighborhood and I stopped coughing, and my mother's coughing has diminished. The friendship ended when I mailed them a non confrontational letter stating the facts and alternatives. They are not talking to us after ten years of friendship. I recently sent your Reducing Wood Smoke pamphlet still hoping that they realize that the smoke is hurting themselves and their neighbors.

It turns out, after my becoming involved in this issue, that my story is fairly typical. Even when people learn that their wood burning is hurting people, they continue. The people I know of are intelligent, they have enough money to either turn the heater on or convert to gas but their mentality is like a smokers. They like the feeling and they don't want anyone telling them what to do. Many of the people I have talked to who are affected by the wood burning, especially seniors, know that if they confront the wood burner they will have the same outcome. One gentleman I talked to who lives next to a burner said you can't pit neighbor against neighbor and it is the government's responsibility to regulate wood burning.

Your proposed regulation is better than nothing but it has to be the first step in eliminating all wood burning. No one has the right to pollute their air in my home or anyone else's. I have learned that people are really suffering and some have to leave their homes. It is inexcusable. This ban cannot be voluntary, it needs strict regulation and substantial fines. The people who truly cannot afford to turn on their heaters or convert to gas should receive financial assistance. The wood industry and the few protesters cannot continue to sway air boards into weakening air pollution regulation. Protecting people's health takes precedence above financial interests and people's right to contaminate their own air and everyone else's.

People are now being protected against second hand smoke in public places. Now the Board must protect our air inside our own homes.

Breathing wood smoke is like being forced to inhale someone else's cigarette smoke. Only worse.

District Response: Your comment has been noted.

Comment # 34 (Chris Sharron, West Oregon Wood Products)

West Oregon Wood Products is a small company that manufactures wood pellet fuel and all-wood (no waxes or additives of any kind) firelogs. As such I urge you to alter the provision of draft Regulation 6, Rule 3, wood burning devices that apply to labeling of solid fuel for sale in your region. Although my products are not generally for sale in your region, there is the possibility that a dealer or distributor will ship some of my pellets into you region. This is especially true when sudden weather changes effect pellet fuel/firelog availability.

The message conveyed in this label, that local counties my prohibit the use of this product on certain days, does not apply to most of the U.S. and much of my company's market area. Furthermore, conveying information about prohibition on use is the job of your agency. The burden of such notification should not be shifted to companies that potentially could be doing business in your region.

My company orders our pellet bags and firelog labels only a couple of times a year, and this is a very difficult – if not impossible- provision with which to comply, as we would

have to carry specific inventory of products destined only for your region. Please reconsider this provision and the breadth of impact it could have beyond your region.

District Response:

The Air District conducted a socioeconomic analysis of the impact of the labeling requirement. It was determined, based on this analysis, that the cost of the labeling requirement is not significant since any increase in manufacturing cost can be passed on at the point of purchase. The proposed rule states the labeling requirement will apply to “any person offering for sale, selling or providing solid fuel or wood intended for use in a woodburning device within District boundaries...” therefore a manufacturer of a product not generally for sale within the district may opt to have this requirement met by the distributor or retailer of the product.

Similar Air District labeling requirements have been met by other industries in a cost effective manner. Some chose to affix labels after the manufacturing as a cost effective means of compliance.

Comment # 35 (Chris Caron, DuraFlame Inc.):

Duraflame remains deeply concerned about the above referenced proposed rule. While we support the Air District’s objective to reduce PM 2.5 emissions from residential solid fuel burning to attempt to attain federal air quality standards, the district’s public information policies and proposed administrative requirements for Rule 3 go beyond reasonable requirements to attain such standards.

Duraflame particularly objects to the overreaching requirement that manufacturers and sellers of solid fuel for wood burning devices be required to label their products with a Health Warning label per section 404.1 of the draft rule.

Duraflame has participated extensively in the rulemaking process over many months submitting written comments, meeting several times with the Director and staff, and suggesting alternative measures to achieve the same objectives of the Districts current proposal. The District Staff has failed to give reasonable consideration to any of the alternatives Duraflame has proposed, and has not met its obligation to demonstrate that its solid fuel labeling proposals will facilitate attainment of air quality standards.

Duraflame respectfully requests the District reconsider the proposed warning label for the following reasons:

1. The District has provided no evidence of a direct health impact from the burning of Duraflame or other brand firelogs on the consumer of the product or the general public and therefore has not established a valid problem which the proposed Health warning label should alleviate.

2. The District has not provided any analysis that product labeling can quantitatively reduce particulate matter emissions and therefore the district has failed to meet its obligation to demonstrate that the proposed product label will promote attainment of state or federal ambient air quality standards.

3. The proposed regulation does not provide for any alternative methods to product labeling that would equally meet the District's regulatory and administrative objectives without undue prejudice to Duraflame economically or unfairly stigmatizing the clean burning nature of its products.

Further the rule could establish a precedent for product labeling that may subject Duraflame to multi-state, county or local regulation throughout the United States. The label is arbitrary in that regard, and will impact interstate commerce. If product labeling was warranted to promote attainment of state or federal ambient air quality standards then the proper jurisdiction for establishment of such a provision is that of a state or federal agency and beyond the purview of a local air quality management district.

While Jeff McKay's May 8, 2008 letter to our company indicates the staff has attempted to make its labeling requirement more general and non specific to the District in order to reduce the financial and logistical impact of implementation on manufacturers such as Duraflame, due to the unsubstantiated, negative health stigma the proposed label connotes, no reasonable manufacturer would distribute products to any geography beyond which it is obligated to do so.

The arbitrary nature of the proposed labeling could also subject manufacturers such as Duraflame to inadvertent violation of the rule in a manner beyond its knowledge or control. Duraflame distributes its products to multi-regional retailers and distributors of solid fuel products which operate distribution centers outside of the District. Duraflame may ship product intended for sale outside of the Bay Area to such multi-regional distributors, but cannot control such distributors from mistakenly or intentionally shipping non-compliant product into the Bay Area creating a violation beyond the reasonable control of the manufacturer.

Lastly, should the District ignore these valid concerns and implement the proposed labeling Duraflame could not reasonably comply with the planned implementation date of January 1, 2009 without being exposed to significant financial harm as it has already purchased product packaging and manufactured products that would likely be in distribution beyond that date. Duraflame requests that implementation of any required change in product labeling be extended until September, 2009 to allow for an orderly sell through and transition to new compliant packaging that does not unduly prejudice Duraflame or its distributors.

We appreciate your consideration of the significant problems caused by the proposed label requirement and look forward to working with the District toward a mutually satisfactory solution.

District Response:

The content or specific language that needed to be provided as part of the solid fuel labeling requirement was amended to assist industry with implementing this important requirement. Industry expressed concerns that the language that the District was requiring to be provided necessitated packaging changes for just the Bay Area sales market. For products that are marketed across the country, the narrow focus of special packaging to only the Bay Area market presented industry significant challenges. In order to address these concerns, staff amended the required information to allow wider distribution to the largest sales/marketing area possible.

The Air District conducted a socioeconomic analysis of the impact of the labeling requirement. It was determined, based on this analysis, that the cost of the labeling requirement is not significant since any increase in manufacturing cost can be passed on at the point of purchase. Other consumer products (aerosol spray paints) have demonstrated that they can meet similar labeling requirement in a cost effective manner and resolve the challenges associated with distributing their products to regional markets.

The Air District has changed the implementation date of the labeling requirement to July 2009 to allow industry time for a sell through of existing product and create new product labels.

Comment #36 Air Resources Board (Sally Rump):

The rule should specify the date when the mandatory solid-fuel burning curtailment will be effective. Since the effective date for other requirements in the rule is January 1, 2009 and curtailment will run from November through February, the District may already be intending to start the program on November 1st, 2008. The District's Spare the Air Tonight voluntary curtailment program already provides the infrastructure needed for the mandatory program. Starting the program this year also provides the benefit of PM2.5 emission reductions well before PM2.5 attainment Plans for the national 24 hour PM2.5 standard of 35 ug/m3 are due in 2012.

The enforcement actions the District will take if a violation of the mandatory curtailment occurs should be specified in the rule. For example, for a first violation, the person may be required to attend a smoke awareness course, or pay a penalty. Penalty amount would increase with number of violations.

District Response:

The effective date for the curtailment standard will be the date of adoption of the proposed regulation. Therefore, a curtailment of wood burning will be in effect when concentrations of PM2.5 exceed the National Ambient Air Quality Standard of 35 micrograms per cubic meter from November 1, 2008 to February 28, 2009.

Also see response to Comment #2.

Comment #37 (Lia Gaertner)

I am writing this letter in support of the strictest wood smoke regulation possible. Wood smoke is a VERY troublesome issue in our Sonoma County neighborhood. In fact, I have paid \$7000 to install gas stoves in two of my neighbors' homes. We are not rich; rather, we are in debt since my husband has been in medical school and residency for the past 8 years while I have been home raising our children. Needless to say, \$7000 is an extraordinary sum to pay for slightly cleaner air in our house. Many of our other neighbors burn all winter, so our cul-de-sac is still filled with smoke all day and night from October through April. Our house becomes smokey and it is literally impossible to walk or play outside without gasping for those 6 months, even if it is 78 degrees and gorgeous. When we walk from the car to the house (less than 10 feet), we smell as if we have just come from a campfire.

When we bought our house in the summer of 2004, we had no concept of what winter was like in a cul-de-sac in a valley with no breeze. We were clueless that everyone around us would be burning all winter long, all night and day long. We had no idea how hard it would be to breath or how toxic it was to our croup-prone daughter, our fetus (now a 3 year old with severe allergies), and to ourselves. We have a two-story home that is surrounded on each side by one story homes that are around 15 feet from our house. Their chimneys align directly with our second story bedroom windows. The neighbors on the right and left side of our house are senior citizens who stay home all day, with only a few outings per week. They would light their fires all day and let them smolder all night. One neighbor had an EPA-certified pellet stove that she always burned too cold (the smoke was thick, black, and smelly). The neighbor on the other side had a fireplace. We felt desperate and asked them if they could limit the burning or at least warn us (when they burned on 78 degree days) so we could have time to close our windows. They were unwilling to negotiate and stated their right to burn. Our daughter was very sick with croup and pneumonia that winter. We called the BAQMD who sent out a representative to try to assess the situation. He told us that the only way he could do anything was if the neighbor was burning garbage, which was impossible to prove. He assisted me in trying to confront the neighbor's son (who lived with his mother), and he threatened us (I was 8 months pregnant and holding a 3 year old) with his mafia connections.

After much research, we realized that we had no legal rights and no other option but to offer to buy them stoves. They refused. It's a long story, but after months of mediation by a local police officer (our hero, Dennis Colthurst), we were finally allowed to buy both neighbors top-of-the-line gas stoves with remote control heating and enough Btu's to heat a house 3 times their size. **NOTE: THEY BOTH HAVE HIGHLY EFFICIENT HOME HEATING SYSTEMS** which they also use.

We understand each citizen's right to have a fire in their fireplace or woodstove, but we think that there is such a high cost in the whole neighborhood's health, that there must be

some compromise. I heard someone say, "If it's not legal for my 6 year old to smoke a pack of cigarettes a day, then why is it legal for our neighbors to force that much smoke into my child's lungs?"

My grandmother just died of lung cancer (after never having smoked cigarettes) and now my very fit mother has COPD/emphysema (after never having smoked cigarettes). I feel that my children and I have the right to try to avoid lung disease, as do we all. Please help us.

District Response:

Your comment has been noted. Staff believes adoption of this proposed new rule will provide additional mechanisms that may help to address these types of occurrences.

Comment #38 (Karen Fulton Holine)

The American Lung Association of California (ALAC) wishes to commend the Bay Area Air Quality Management District for developing a vitally important public health measure to reduce harmful exposures of wood smoke pollution in the Bay Area. Regulation 6, Rule 3 to Control Particulate Matter and Visible Emissions from Wood-Burning Devices will provide public health protections for years to come for the seven million residents of the Bay Area, including more than one million who suffer from lung disease.

The staff has done an excellent job in crafting a sensible regulation that will not only promote improved air quality regionally, but will provide much needed protections for residents in their communities from toxic wood smoke exposures. The public has been waiting for this regulation for many years. As you know, the air district sought to adopt a regulation as far back as 1994 because it understood how harmful wood smoke pollution is. Despite two decades of voluntary efforts to educate the public about the harmful effects of wood smoke pollution and cleaner burning alternatives, lack of controls has created unhealthy air for everyone, and a situation where residents are being sickened in their homes and communities.

The hazards of particle pollution are well known. More than 2,000 peerreviewed studies showing the dangers of particle pollution have been published since 1996. Particle pollution diminishes lung function; causes inflammation of lung tissue in young, healthy adults; causes greater use of asthma medications; results in increased hospitalization for asthma among children, as well as increasing the severity of pediatric asthma. Particle pollution can damage the body in ways similar to cigarette smoking. This finding helps explain why particle pollution can cause heart attacks and strokes. Even short term exposures can be fatal. We are in strong support of this regulation and hope that BAAQMD will move quickly to adopt it.

The American Lung Association is especially pleased that this regulation will curtail all wood burning when air quality reaches unhealthy levels. When air pollution levels are already unhealthy, it makes no sense to allow additional pollution to be added to it from EPA-certified devices. While it is true that EPA certified wood stoves may produce less particulate air pollution than uncertified ones when new and operated according to manufacturer specifications, they produce hundreds of times more particulate pollution than heaters that burn natural gas. Many of the calls we get at the ALAC are from families whose health is being impacted by individuals burning in EPA-certified stoves. As we heard during the public comment, many of these devices pollute significantly – either due to age, lack of maintenance, or incorrect operation. A study conducted by the US EPA found that Phase II Certified devices can emit significant levels of pollution above certified values.

In summary, the ALA is gratified the Bay Area Air Quality Management District is finally moving forward to adopt a regulation that will protect public health and allow the air district to respond to public complaints of wood smoke exposures. As shown by the letters to the air district and from the many workshops held around the Bay Area, the public supports this rule. On behalf of those we serve, thank you for your leadership in achieving healthy air for all residents. By supporting this regulation, your actions will help improve breathing, health and quality of life for everyone.

District Response: Your comment has been noted.

Comment # 39 (Armand M. Estrada)

Are there any plans to regulate/prohibit the use of outdoor wood pits? During the evenings, many homeowners create wood fires for “entertainment”. The air is bad enough around here-Contra Costa County (Alamo) from BBQs etc. It is difficult trying to convince neighbors not to burn even in light of the smoke pouring into my house and damaging my trees.

Now that I read the changes, I must say that they do little to curtail outdoor firepits. First, rarely do people use them in the winter as it is too cold and as you know, such pits provide little heat. Moreover, the permitted use should be prohibited if the smoke flows onto neighboring properties. Is the comment period over for these proposed amendments?

District Response:

See response to Comment #1. The formal comment period for the proposed regulation ended June 27, 2008, but your comment has been noted.

Comment #40 (Sheila Lagios)

I have been against your proposal to ban use of home fireplaces CEQA, regulation 6, rule 3 and the events of this past week have underscored my objections on several levels. The amount of smoke (particulates and carbon monoxide) produced by home fireplaces is relatively small by your own calculations in the overall contribution to air quality except on certain air inversion days. However it does make you look as though you are doing something positive and it is not a front on which you will receive “big money” opposition.

We are currently and have been for over a week engulfed by the smoke of the hundreds of wildfires which have hit northern California. The smoke levels have been so bad that any outdoor activities have produced respiratory distress, even in healthy individuals. However, I have failed to see “Save the Air” days called for the entire week which would have been most appropriate. Somehow there seems to be a disconnect here.

Again, I voice my opposition to your plans to ban or limit the use of home fireplaces except on critical days. Perhaps you should focus your energies where the majority of the air pollution is generated. And you certainly should be more responsive when we have such critical air quality days as this past week has produced.

District Response:

The contribution to wintertime peak airborne fine particulate levels from wood-burning devices is significant. Reaching levels up to thirty-three percent of total fine airborne particulate matter, wood burning devices must be curtailed for these elevated levels to be reduced. The Air District believes that it cannot achieve compliance with the recently lowered National Ambient Air Quality Standard for fine particulate without this proposed rule.

The proposed regulation limits curtailment of wood-burning devices to the winter months in which wood smoke is routinely a public health concern. The Spare the Air advisories for the summertime are issued when ozone levels are forecast to reach unsafe levels. Actions taken by individuals participating in the Spare the Air program reduces air pollutants but would not have had a significant impact on overall air quality over the prior week because the source of unhealthy air quality were the numerous wildfires. The causes of these wildfires are events beyond the scope of the proposed regulation.

During the recent air pollution incidents involving both the Summit fire in Santa Cruz County and the wide-spread impacts from all the Northern California wildfires, the Air District issued smoke and/or Health Advisories to inform Bay Area residents of the elevated levels of fine particulate matter air pollution being measured. The public could then make more informed decisions regarding their daily activities in order to reduce their exposure to the air pollution. In fact the air pollution levels were at elevated values typically only seen during the winter months. Currently, spare the air is only a voluntary program and any reductions in particulate matter air pollution from reduced driving or

reduced wood burning in June would have been insignificant given the magnitude and meteorology occurring during the fires.

Comment #41 (Howard Read)

I have been in touch with Jenny Bard of the American Lung Association, and have learned about the public hearing in San Francisco on July 9th. It's not possible for me to attend that hearing; thus, I'm sending my comments to you.

I support any wood burning regulation (the tougher the better) you approve that you feel will be legally successful and enforceable.

My Berkeley hills neighborhood literally stinks in wood burning season, November-February. I hate to think about the harmful pollutants in the air, all because of self-indulgent neighbors who seem not to care that their chimney emissions are very near my home. Ideally, I would like to see a total ban on wood burning in the entire Bay area. Short of that, wood burning in dense residential neighborhoods should be banned totally when homes are very close together.

District Response: Your comment has been noted.

Comment # 42 (Mark A. Medearis, American Wood Fibers)

As a manufacture of wood pellet fuel, I strongly urge you to alter the provisions of draft regulation 6. Rule 3, wood burning devices that apply to labeling of solid fuel for sale in your region. Although my products are not generally for sale in your region, there is the possibility that a dealer or distributor will ship some of my pellets into your region. This is especially true when sudden changes in market factors effect pellet fuel availability.

The message conveyed in this label, that local counties may prohibit the use of this product on certain days, does not apply to most of the U.S. and much of my company's market area.

Furthermore, conveying information about prohibitions on use is the job of your agency. The burden of such notification should not be shifted to companies that potentially could be doing business in your region.

My company orders our product bags once a year, and this is a very difficult,-if not impossible-provision with which to comply. Please reconsider this provision and the breadth of impact it could have.

District Response: See response to comment #34.

Appendix D
Socioeconomic Impact Analysis

SOCIOECONOMIC
ANALYSIS
PROPOSED RULE

REGULATION 6, RULE 3:
CONTROLLING PARTICULATE MATTER AND VISIBLE
EMISSIONS FROM WOOD-BURNING DEVICES

June, 2008

Prepared for
Bay Area Air Quality
Management District

Prepared by

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1. DESCRIPTION OF THE PROPOSED RULE

Regulation 6, Rule 3 (Controlling Particulate Matter and Visible Emissions from Wood-burning Devices) limits both emissions of particulate matter (PM) and visible emissions (VE) from wood-burning devices, as part of an overall wood smoke reduction program within the jurisdiction of the Air District. The proposed rule would reduce wintertime PM_{2.5} levels by curtailing wintertime wood-burning emissions from wood-burning devices, which includes fireplaces, and achieve additional reductions by requiring cleaner burning technologies in new construction. In addition, non-wintertime burning will be improved by requiring appropriate fuel with low-moisture content be used throughout the year in woodburning devices.

Currently, there is no Air District rule which directly limits emissions from wood-burning devices. Air District Regulation 1 has historically excluded regulation of any fires associated with residential heating and will be amended to remove this exclusion. An amendment to existing Regulation 5, Open Burning, will remove an exemption for outdoor wood fires set for recreational purposes and create a similar requirement to curtail wintertime burning outdoor as well as indoor.

A wood-burning device is any indoor wood-burning stove or insert, pellet-fueled device, conventional fireplace and/or any indoor permanently-installed device burning solid-fuel for aesthetic or space-heating purposes in structures for residential or commercial use. The proposal for wood-burning devices would:

1. Curtail operation of any wood-burning device during periods forecast to negatively impact public health due to PM_{2.5} levels;
2. Establish limitations on visible emissions from wood burning;
3. Establish criteria for the sale, transfer or installation of wood-burning devices;

4. Establish criteria for the installation of wood-burning devices in new building construction;
5. Prohibit the burning of garbage and certain types of materials;
6. Establish requirements for the sale of wood products for use in wood-burning devices.

2. IMPACT OF PROPOSED RULE AMENDMENTS

This section of the socioeconomic analysis describes demographic and economic trends in the San Francisco Bay Area (Bay Area) region. Following an overview of the methodology for the socioeconomic analysis, the first part of this section compares the Bay Area against California and provides a context for understanding demographic and economic changes that have occurred within the Bay Area between 1996 and 2006. After an overview of Bay Area industries, we focus on households and industries impacted by the proposed Regulation 6, Rule 3.

For the purposes of this report, the Bay Area region is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

METHODOLOGY

The socioeconomic analysis of the proposed wood-burning devices rule involves the use of information provided directly by BAAQMD, as well as secondary data used to describe the industries affected by the proposed rule amendments.

Based on information provided by BAAQMD staff, ADE determined that the impacts would affect households and businesses in a narrow set of industries. With this information we began to prepare economic descriptions of the industry groups of which the impacted sites are a part, as well as to analyze data on the number of jobs, sales levels, the typical profit ratios and other economic indicators for the Bay Area businesses. In addition, we collected demographic information of typical households living in various housing settings, from owner-occupied single-family homes to renters living in large apartment complexes.

With the annual reports and data from the US Economic Census and other sources such as US IRS, ADE was able to estimate revenues and profit ratios for many of the sites impacted by the proposed rule amendments. In calculating aggregate revenues generated by Bay Area businesses in

affected industries, ADE first estimated annual revenue based upon available data. Using annual reports and publicly available data, ADE calculated ratios of profit per dollar of sales for the businesses on which the analysis focused. ADE also utilized data from California's Board of Equalization.

The result of the socioeconomic analysis shows what proportion of profit the compliance costs represent. Based on a given threshold of significance, ADE discusses in the report whether the affected sites are likely to reduce jobs as a means of recouping the cost of compliance or as a result of reducing business operations. ADE also examines whether affected industries can pass costs to consumers. To the extent that such job losses appear likely, the indirect multiplier effects of the job losses area estimated using a regional IMPLAN input-output model.

With respect to impacts on households purchasing new homes with fireplaces that meet BAAQMD's proposed new guidelines, ADE gathered information from US Census, particularly 2006 American Community Survey (ACS) data on households in the nine-county Bay Area. ADE identified typical households in a variety of housing arrangements, from households in owner-occupied single-family homes to renters living in large apartment complex. ADE identified average household incomes for households in various housing arrangements, and based on this information, compared incremental cost impacts stemming from the new wood burning rule against household incomes, to analyze whether incremental cost impacts are significant when analyzed as a percent of household income.

REGIONAL DEMOGRAPHIC TRENDS

The Bay Area experienced moderate population growth from 1996 to 2006. Between 1996 and 2001, the nine-county region increased by 1.3 percent annually, from 6.5 million in 1996 to almost 6.8 million in 2001. From 1996 to 2006, the population increase was from 6.5 million to close to 7.1 million for an increase of approximately one percent annually. Over the same period, California grew at a faster rate of 1.4 percent per year.

Within the Bay Area, the greatest percentage increase occurred in Contra Costa County. From 1996 to 2006 Contra Costa increased its population by nearly 1.7 percent annually. All other Bay Area counties had population increases slower than Contra Costa County and the State. The smallest percentage increase occurred in Marin County where population grew annually by 0.5 percent from 1996 to 2006.

TABLE 1
Population Growth: San Francisco Bay Area

	Population			Percent Change		
	1996	2001	2006	96-01	01-06	96-06
California	32,222,873	34,441,561	37,195,240	1.3%	1.6%	1.4%
Bay Area	6,454,434	6,872,313	7,135,505	1.3%	0.8%	1.0%
Alameda County	1,356,339	1,465,753	1,509,981	1.6%	0.6%	1.1%
Contra Costa County	872,631	966,845	1,030,732	2.1%	1.3%	1.7%
Marin County	239,251	248,994	253,818	0.8%	0.4%	0.6%
Napa County	118,381	126,093	134,326	1.3%	1.3%	1.3%
San Francisco County	759,833	784,031	800,099	0.6%	0.4%	0.5%
San Mateo County	693,815	712,527	726,336	0.5%	0.4%	0.5%
Santa Clara County	1,620,744	1,701,665	1,780,449	1.0%	0.9%	0.9%
Solano County	371,453	401,662	421,542	1.6%	1.0%	1.3%
Sonoma County	421,987	464,743	478,222	1.9%	0.6%	1.3%

Source: Applied Development Economics, based on household population estimates from The California Department of Finance

REGIONAL ECONOMIC TRENDS

The Bay Area is one of the world's greatest regional economies. It benefits from pre-eminent knowledge-based industries, with competitive strength flowing from an unmatched culture of entrepreneurship, world-leading research institutions, and some of the nation's best educated and most highly skilled workforce. With these remarkable advantages, it has led through innovation in a wide range of research and industrial fields. However, in the five year period between 2001 and 2006, the Bay Area economy has not grown significantly with respect to employment, which contrasts with robust employment growth in the Bay Area between 1996 and 2001.

As Table 2 shows, as of 2006, the professional and business services sector was the largest employer in the region, at 554,576 jobs or 17 percent of all private and public sector

jobs. This is a change from 1996 when professional and business services accounted for 16 percent of all Bay Area employment. While professional and business service increased annually by a rapid rate of four percent between 1996 and 2001, between 2001 and 2006 employment actually declined in this sector by an annual clip of two percent. The broad category of Trade, Transportation and Utilities also boasts large workforce at 17 percent of total public and private employment; but a large part of this category consists of workers in Retail, a sub-sector within Trade, Transportation and Utilities. Another large industry in the Bay Area is public service, or government, with 442,000 jobs, or almost 14 percent of the total. Within the public sector, employment has risen fastest since 2001 in state government, whereas local government employment barely grew at a 0.2 percent annual pace between 2001 and 2006, and employment in federal agencies declined over the five year period. Employment in manufacturing accounted for slightly over 10 percent of total employment, but this sector declined significantly between 2001 and 2006, dropping annually by over five percent. Overall, since 2001, total public and private employment dropped by slightly over one percent a year, going from 3,484,800 workers in 2001 to 3,275,600 workers in 2006.

TABLE 2
Employment Profile of the San Francisco Bay Area, 1996-2006

Industry	1996	2001	2006	% of Total Employment in 2006	% Change 1996 - 2001	% Change 2001 - 2006
Total, all private industries	2,654,847	3,047,015	2,833,513		2.8%	-1.4%
Goods-Producing	612,549	682,135	567,697		2.2%	-3.6%
Natural Resources and Mining	26,861	29,517	22,760	0.7%	1.9%	-5.1%
Construction	128,937	192,338	192,897	5.9%	8.3%	0.1%
Manufacturing	456,754	460,281	352,040	10.7%	0.2%	-5.2%
Service-Providing	2,042,295	2,364,884	2,265,815		3.0%	-0.9%
Trade, Transportation, and Utilities	563,672	608,241	561,357	17.1%	1.5%	-1.6%
Information	96,876	147,581	112,820	3.4%	8.8%	-5.2%
Financial Activities	194,069	208,854	213,378	6.5%	1.5%	0.4%
Professional and Business Services	509,591	619,989	554,576	16.9%	4.0%	-2.2%
Education and Health Services	285,917	337,874	360,678	11.0%	3.4%	1.3%
Leisure and Hospitality	273,778	304,944	320,772	9.8%	2.2%	1.0%
Other Services	117,887	131,398	142,238	4.3%	2.2%	1.6%
Government Ownership:						
Federal Government	83,162	57,652	53,001	1.6%	-7.1%	-1.7%
State Government	108,771	81,895	87,874	2.7%	-5.5%	1.4%
Local Government	231,635	298,251	301,173	9.2%	5.2%	0.2%
Total, all public and private industries	3,078,415	3,484,813	3,275,561	100.00%	2.5%	-1.2%

Source: Applied Development Economics from data supplied by the Labor Market Information Division of the California Employment Development Department

DESCRIPTION OF AFFECTED HOUSEHOLDS AND INDUSTRIES

Proposed Regulation 9, Rule 3 potentially affects particular wood products manufacturers, retailers, and households in the Bay Area. Table 3 below identifies wood product manufacturers in the San Francisco Bay Area. Table 3 shows that this industry has declined since 2001 in terms of number of businesses and employment. It is important to note that, while there are a number of wood products manufacturers in the region served by the BAAQMD, none actually manufacture fire logs and other products subject to the proposed regulation.

TABLE 3
Wood Products Manufacturing Industries: Nine-County San Francisco Bay Area, 2001-2006

NAICS Code	Description	2001		Average Size	Avg Wages
		Establishments	Employment		
3219	Other wood product manufacturing	190	2,706	14	\$36,548
32191	Millwork	83	980	12	\$42,541
3219x	Rest of "Other wood product" excluding millwork	107	1,726	16	\$33,145
21999	All other miscellaneous woods products manufacturing	28	216	8	\$34,623

NAICS Code	Description	2006		Average Size	Avg Wages
		Establishments	Employment		
3219	Other wood product manufacturing	147	2,167	15	\$38,401
32191	Millwork	75	850	11	\$43,163
3219x	Rest of "Other wood product" excluding millwork	72	1,317	18	\$35,328
21999	All other miscellaneous woods products manufacturing	20	146	7	\$37,561

NAICS Code	Description	2001-2006 Change		Average Size	Avg Wages
		Establishments	Employment		
3219	Other wood product manufacturing	-43	-539	1	\$1,854
32191	Millwork	-8	-130	0	\$623
3219x	Rest of "Other wood product" excluding millwork	-35	-409	2	\$2,183
21999	All other miscellaneous woods products manufacturing	-8	-70	-1	\$2,938

Source: Applied Development Economics, based on Minnesota IMPLAN Group 2001-2006 ES202 dataset. [Note: there are no fire log manufacturing plants in the 9-county SF Bay Area. Duraflame and Jarden's Java Logs are based outside of the region.]

While there are no manufacturers of fire logs in the nine-county Bay Area, there is a major manufacturing and wholesale distribution facility in Stockton, California, which is operated by Duraflame. In addition to Duraflame, Bay Area consumers purchase fire logs from producers located outside of the San Francisco Bay Area-San Joaquin County region, if not the State of California.

Table 4 includes an estimate on the total value of fire logs sold in the nine-county Bay Area to consumers. This value is based on an estimate on number of fire logs used by consumers in the region. Table 4 shows that fire log sales amount to a \$203.9 million market. Fire log producers generate an estimated \$6.9 million in net profits. The table below shows that annual aggregate costs resulting from the proposed regulation will amount to \$3.3 million per year in the first five years after rule adoption. At \$3.3 million,

aggregate costs amount to almost half of net profits generated by affected wood products manufacturers, none of whom, it is worth noting, are in the nine-county Bay Area. More than likely, fire log producers including Duraflame will pass costs to retailers as affected manufacturers can not sustain these cost impacts to their respective profits. The analysis below demonstrates that there will be little to no significant impacts to retailers and consumers who must ultimately bear added costs stemming from the proposed rule.

Table 4. Profile of All Fire-Log Producers Serving SF Bay Area Market

Market	All firelog producers, including Duraflame
Est. Revenues	\$203,950,133
Market Share	
Est. Net Profits	\$6,954,700
Initial Annual Compliance Cost (\$0.05 per log)	\$3,365,177
Initial Cost to Estimated Net Profits	48.4%
Significant	yes
Costs Passed on To Retailers	\$3,365,177

Source: Applied Development Economics, based on Dun and Bradstreet, Duraflame, Conros Corp., Jarden Corp., BAAQMD, US Economic Census 2002 and US Census County Business Patterns, Fundinguniverse.com; and, US Internal Revenue Service.

Table 5. Total Annual Costs of All Affected Fire-log Manufacturers Passed Onto Retailers in the Nine-County San Francisco Bay Area Region

	All	Gen Merch Stores	Drug Stores	Food Stores	Lumber\Bldg Materials	Hardware Stores
Stores	5,919	2,208	727	1,462	1,083	439
Taxable Sales	\$21,155,256,048	\$10,662,100,000	\$1,725,058,048	\$2,889,891,000	\$4,954,219,000	\$923,988,000
Actual Sales	\$187,349,822,622	\$174,788,524,590	\$2,755,683,782	\$3,926,482,337	\$4,954,219,000	\$924,912,913
Net Profit Rate	2.72%	2.73%	2.68%	1.47%	3.67%	1.76%
Est. Net Profits	\$5,101,396,642	\$4,771,726,721	\$73,852,325	\$57,719,290	\$181,819,837	\$16,278,467
Initial Annual Cost Passed to Retailers By Fire-Log Producers	\$3,365,177	\$983,595	\$323,856	\$1,379,723	\$482,443	\$195,561
Costs as Percent of Net Profits	0.07%	0.02%	0.44%	2.39%	0.27%	1.20%
Significant	no	no	no	no	no	no

Source: ADE, Inc., based on BAAQMD, California Board of Equalization, ADE Retail Model, US IRS

Table 5 above identifies the type and number of retailers in the Bay Area that potentially sell fire logs. The type of retailer that sell fire log is based on information presented by Duraflame. Table 5 above shows that there are 5,919 retailers in five broad retail categories that potentially sell fire logs. According to California's Board of Equalization, these retailers generated \$21 billion in taxable sales in 2006. Factoring in non-taxable sales, these retailers generated an estimated \$187 billion in retail sales, from which was generated an estimated \$5.1 billion in aggregate profits. At \$3.3 million per year over the first five years after rule adoption, the estimated cost amounts to 0.07 percent of aggregate net profits. Also, within the particular retail segments affected by the rule, cost-to-net profit ratios are similarly low. In other words, impacts to retailers are not significant. Thus, impacted stores might not pass costs onto ultimate end-users, the consumer. While impacts to retailers are less than significant, given that both locally-owned and national retailers typically operate on low profit margins, there is still a possibility that affected retailers will pass costs stemming from the proposed regulation to consumers. For this reason, below we analyze a scenario in which costs are passed on in case this does happen.

Household Trends and Impacts

As Table 6 shows, there are 2.5 million households in the nine-county Bay Area. Of these households, 1.5 million live in owner-occupied housing in which households maintain a mortgage. Of these 1.5 million households, the bulk live in single-family units, or 1.3 million households. Table 6 also shows that there are over 1 million renting households in the Bay Area.

Table 6. Profile of Households By Housing Type, Tenure, and Average Household Income

	Number of Households	Percentage of households with woodburning appliance	Distribution of wood-burning appliances by housing type and tenure	Number of households with woodburning appliance	Average Household Income: all households	Average Household Income: owner-occupied mortgage	Average Household Income: owner-occupied no mortgage	Average Household Income: renter-occupied
Total Housing Units	2,519,760	48%		1,209,485				
Owner occupied:	1,507,511				\$93,634	\$126,345	\$65,778	na
1, detached or attached	1,335,577		100%	1,066,968	\$122,230	\$132,790	\$87,127	na
2 to 4	42,950		0%	0	\$111,654	\$121,301	\$79,588	na
5 to 9	31,746		0%	0	\$83,582	\$90,802	\$59,577	na
10 or more	52,515		0%	0	\$59,328	\$54,891	\$36,015	na
Mobile home and all other units	44,723		0%	0	\$44,045	\$47,850	\$31,396	na
Renter occupied:	1,012,249		0%	0	\$59,882	na	na	\$59,882
1, detached or attached	296,909		100%	142,516	\$77,652	na	na	\$77,652
2 to 4	176,792		0%	0	\$62,073	na	na	\$62,073
5 to 9	130,672		0%	0	\$50,111	na	na	\$50,111
10 or more	399,274		0%	0	\$49,200	na	na	\$49,200
Mobile home and all other units	8,601		0%	0	\$45,767	na	na	\$45,767

Source: Applied Development Economics, based on US Census ACS 2006, Association of Bay Area Governments, and BAAQMD (see "Woodburning appliances in the SFBA", page 1 and "Revised Est. of Wood Burning in SFBA", page 13)

Data in Table 6 above is also broken into three broad categories of “mortgage,” “no mortgage,” and “renters” as incomes for households in each of these broad categories typically differ even when adjusted for housing unit type (i.e. single-family units, duplex, small apartment, mid-sized apartment, and large apartment). Thus, the average household income for households in owner-occupied unit living situations with a mortgage is \$126,345 versus \$65,778 for households without a mortgage. Because spending on a wide variety of goods varies with income, it is important to characterize average household incomes as accurately as possible. Table 6 shows that, of the 2.5 million households in the Bay Area, an estimated 48 percent utilize fire places or wood burning stoves. According to the BAAQMD, almost all of these fire places are in single-family dwelling units. Thus, of the 2.5 million households, 1.2 million have fire places and wood stoves that are potentially subject to the proposed regulation.

In the event retailers pass costs to households, households will bear an estimated \$3.5 million in annual costs over the first five years after rule adoption. This figure is based on the aggregate annual number of logs burned by the 1.2 million households, which is then multiplied against the \$0.05 per log cost (in addition to a certain mark-up for retailers). When the \$3.5 million amount is translated on a per household basis, we arrive at an annual cost of \$2.92 per household. Table 8 is similar to Table 7 except that it analyzes cost impacts stemming from annual compliance costs five years after rule adoption. In both instances, impacts to households are very small.

Table 7. Aggregate and Per Households Passed to Households: San Francisco Bay Area

			Annual average # of logs per day per household		Annual aggregate # of logs per day per All wood-burning household		Initial Annual Cost of Compliance (\$0.05 per label)		Total Unit Cost	Aggregate Annual Cost Borne By All Woodburning Households	Annual Cost Per Woodburning Household	
			fireplaces	woodstoves	fireplaces	woodstoves	Markup	Markup				
		Total Households Living in SFU	Woodburning Households Living in SFU									
		1,632,486	1,209,485			61,631,520	5,672,024	\$0.05	0.25%	\$0.053	\$3,533,436	\$2.92
Owner-occupied	1, detached or attached	1,335,577	1,066,968	0.13	0.07	54,811,801	4,973,967	\$0.05	0.25%	\$0.053	\$3,138,753	\$2.94
Renter-occupied	1, detached or attached	296,909	142,516	0.13	0.07	6,819,719	698,057	\$0.05	0.25%	\$0.053	\$394,683	\$2.77

Source: Applied Development Economics, based on US Census ACS 2006, ABAG, and BAAQMD

Table 8. Aggregate and Per Households Passed to Households: Five Years After Rule Adoption: San Francisco Bay Area

			Annual average # of logs per day per household		Annual aggregate # of logs per day per All wood-burning household		Initial Annual Cost of Compliance (\$0.05 per label)		Total Unit Cost	Aggregate Annual Cost Borne By All Woodburning Households	Annual Cost Per Woodburning Household	
			fireplaces	woodstoves	fireplaces	woodstoves	Markup	Markup				
		Total Households Living in SFU	Woodburning Households Living in SFU									
		1,632,486	1,209,485			61,631,520	5,672,024	\$0.02	0.25%	\$0.023	\$1,514,330	\$1.25
Owner-occupied	1, detached or attached	1,335,577	1,066,968	0.13	0.07	54,811,801	4,973,967	\$0.02	0.25%	\$0.023	\$1,345,180	\$1.26
Renter-occupied	1, detached or attached	296,909	142,516	0.13	0.07	6,819,719	698,057	\$0.02	0.25%	\$0.023	\$169,150	\$1.19

Source: Applied Development Economics, based on US Census ACS 2006, ABAG, and BAAQMD

Table 9 below expresses annual costs as a percent of household incomes. As the table demonstrates, impacts are significantly below one percent, meaning that, more than likely, consumers will not be impacted by costs stemming from the proposed regulation.

Table 9. Costs as a Percent of Household Income

	Annual Cost as Percent of Income			Annual Cost as Percent of Income (Five Years After Rule Adoption)		
	Owner-occupied household with mortgage	Owner-occupied household with no mortgage	Renter households	Owner-occupied household with mortgage	Owner-occupied household with no mortgage	Renter households
Owner-occupied 1, detached or attached	0.002%	0.003%		0.001%	0.001%	
Renter-occupied 1, detached or attached			0.004%			0.002%

Source: Applied Development Economics, based on US Census ACS 2006, ABAG, and BAAQMD

Impacts to purchasers of new homes: \$500 per fire place unit impact

The proposed regulation will also affect construction of new homes. Once adopted, home builders will no longer be able to include wood burning fire places in their new units. Instead, they will be required to include natural gas-fired fire places, for those who choose to include fire places in their respective new units. The cost of a new fire place subject to the new proposed regulation is an estimated \$500. Table 10 analyzes what impacts, if any, a \$500 fire place will have on households interested in purchasing new single-family and multi-family units (i.e. condominiums and townhouses). Data in Table 10 comes from Realtor.com, and is broken down by various housing sub-markets within the nine-county region. The table includes median home prices and the minimum incomes needed to afford new homes at the median price point.

Table 10. Impact of \$500 on New Single-Family and Multi-Family Dwelling Units: Housing Affordability

Housing Sub-Market	Original Median Price		Qualifying Household Income before rule	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$965,000	\$584,488	\$263,516	\$159,608
San Francisco-Oakland	\$729,000	\$569,990	\$199,070	\$155,649
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$509,975	\$428,285	\$139,260	\$116,953
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$734,900	\$507,335	\$200,681	\$138,540
Livermore-Danville-Dublin-Sunol	\$899,000	\$499,000	\$245,493	\$136,263

Housing Sub-Market	Median Price Post \$500		Qualifying Household Income after rule	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$965,706	\$585,053	\$263,708	\$159,762
San Francisco-Oakland	\$729,706	\$570,555	\$199,263	\$155,803
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$510,681	\$428,850	\$139,453	\$117,107
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$735,606	\$507,900	\$200,874	\$138,694
Livermore-Danville-Dublin-Sunol	\$899,706	\$499,565	\$245,686	\$136,418

Housing Sub-Market	Impact: Change in Qualifying Household Income		Impact: Percent Change Qualifying Household Income	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$193	\$154	0.07%	0.10%
San Francisco-Oakland	\$193	\$154	0.10%	0.10%
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$193	\$154	0.14%	0.13%
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$193	\$154	0.10%	0.11%
Livermore-Danville-Dublin-Sunol	\$193	\$154	0.08%	0.11%

As Table 10 above shows, the \$500 per fireplace impact would alter qualifying income very little. Prior to rule adoption, households interested in purchasing a new median-priced single-family home (\$965,000) in the San Jose-Silicon Valley sub-market needs at least \$263,500, assuming 20 percent down and an interest rate of 6.5 percent. After rule adoption, the qualifying income rises to \$263,700, for a change of less than one percent (or 0.07 percent). Across the board, impacts stemming from the rule do not affect housing affordability.

Table 11 below is included to show how a 25 basis points change in the interest rate, from 6.5 percent to 6.75 percent, impacts housing affordability. Changes in interest rates by 25 basis points alter minimum qualifying incomes by approximately 2.13 percent for households interested in purchasing new median-priced single-family homes. Interest rate changes also affect households interested in purchasing new median-priced town houses or condominiums. In short, larger market forces with respect to interest rates and overall home prices exert greater influence on housing affordability than the \$500 per fireplace impact associated with the BAAQMD's proposed wood-burning rule.

**Table 11. Impact of 25 Basis Point Change in Interest Rate on New Single-Family and Multi-Family Dwelling Units:
Housing Affordability**

Housing Sub-Market	Median Price		Qualifying Household Income at 6.5% interest	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$965,000	\$584,488	\$263,516	\$159,608
San Francisco-Oakland	\$729,000	\$569,990	\$199,070	\$155,649
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$509,975	\$428,285	\$139,260	\$116,953
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$734,900	\$507,335	\$200,681	\$138,540
Livermore-Danville-Dublin-Sunol	\$899,000	\$499,000	\$245,493	\$136,263

Housing Sub-Market	Median Price		Qualifying Household Income at 6.75% interest	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$965,000	\$584,488	\$269,118	\$163,001
San Francisco-Oakland	\$729,000	\$569,990	\$203,303	\$158,958
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$509,975	\$428,285	\$142,221	\$119,440
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$734,900	\$507,335	\$204,948	\$141,485
Livermore-Danville-Dublin-Sunol	\$899,000	\$499,000	\$250,712	\$139,161

Housing Sub-Market	Impact: Change in Qualifying Household Income		Impact: Percent Change Qualifying Household Income	
	New Single-Family Unit	New Condo\Townhouse	New Single-Family Unit	New Condo\Townhouse
San Jose-Campbell-Cupertino-Los Gatos-Milpitas-Morgan Hill-Santa Clara-Sunnyvale-Saratoga	\$5,603	\$3,393	2.13%	2.13%
San Francisco-Oakland	\$4,232	\$3,309	2.13%	2.13%
Santa Rosa-Healdsburg-Sebastapol-Rohnert Park-Windsor	\$2,961	\$2,487	2.13%	2.13%
Antioch-Blackhawk-Brentwood-Concord-Pittsburg-Pleasant-San Ramon-Suisun	\$4,267	\$2,945	2.13%	2.13%
Livermore-Danville-Dublin-Sunol	\$5,219	\$2,897	2.13%	2.13%

IMPACT ON SMALL BUSINESS

DEFINITION OF SMALL BUSINESS PER CALIFORNIA STATUTE

For purposes of qualifying small businesses for bid preferences on state contracts and other benefits, the State of California defines small businesses in the following manner:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California
- Must have its owners (or officers in the case of a corporation) domiciled in California; and,
- Together with its affiliates, be either:
 - A business with 100 or fewer employees, and an average gross receipts of \$10 million or less over the previous tax years, or
 - A manufacturer with 100 or fewer employees

SMALL BUSINESS IMPACT ANALYSIS

The analysis above shows that impacts stemming from the \$0.05 label are less than significant, particularly from the vantage point of the ultimate end-user of fire logs, namely households. In addition, the analysis shows that impacts to purchasers of new homes subject to the proposed regulation are not significantly impacted. As a result, there are no secondary impacts resulting from changes in household spending habits, meaning small businesses, particularly retail and services, are not disproportionately impacted by the rule.

Appendix E
CEQA Draft EIR

**Draft Environmental Impact Report for the
Bay Area Air Quality Management District's
Proposed Regulation 6, Rule 3 Wood-Burning Devices**

May 5, 2008

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

DRAFT ENVIRONMENT IMPACT REPORT

PROPOSED REGULATION 6, RULE 3: WOOD-BURNING DEVICES

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Appendix A: Notice of Preparation and Initial Study on the Draft EIR

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CHAPTER 1

INTRODUCTION

Introduction

- California Environmental Quality Act
- Notice of Preparation and Initial Study
- Type of EIR
- Intended Uses of this Document
- Areas of Controversy
- Project Objectives
- Document Format

Executive Summary of Draft EIR

- Executive Summary – Chapter 2: Project Description
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- Executive Summary – Chapter 4: Alternatives
- Executive Summary – Chapter 5: Other CEQA Topics

1.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or District) was established in 1955 by the California Legislature to control air pollution in the counties around the San Francisco Bay and to attain federal air quality standards by the dates specified in federal law. There have been significant improvements in air quality in the Bay Area over the last several decades. The BAAQMD is also required to meet state standards by the earliest date achievable.

For the last several years the District has been refining the emission inventory for emissions from wood-burning devices, which are a significant source of particulate emissions, and attempting to reduce fine particulates from these devices. Considerable further reductions in emissions from wood-burning devices are available through the implementation of Regulation 6, Rule 3 (Reg 6-3): Particulate Matter and Visible Emissions from Woodburning Devices. The District is proposing to adopt this new rule to ensure these reductions are realized, and to encourage residences and businesses to operate wood-burning devices appropriately to ensure reductions in emissions.

This Environmental Impact Report (EIR) addresses the impacts due to implementation of the Bay Area Air Quality Management District Regulation 6, Rule 3, Woodburning Devices. The District is also proposing to amend District Regulation 1: General Provisions and Definitions, to remove the existing exclusion of residential fires from regulation; and Regulation 5: Open Burning, to require a provision for outdoor recreational fires similar to that proposed in Reg 6-3.

1.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified.

To fulfill the purpose and intent of CEQA, the BAAQMD has prepared this EIR under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the proposed Regulation 6, Rule 3. Amendments to several other District rules are also proposed in order to allow regulation of this type of source and to maintain consistency with Regulation 6, Rule 3 for similar types of sources. Prior to making a decision on the adoption of the new wood-burning device rule, the BAAQMD Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Rule.

1.1.2 NOTICE OF PREPARATION AND INITIAL STUDY

A Notice of Preparation and Initial Study (NOP/IS) for the adoption of District Regulation 6, Rule 3 (included as Appendix A of this EIR) was distributed to responsible

agencies and interested parties for a 30-day review on March 10, 2008. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the BAAQMD's web site, and was also published in newspapers throughout the area of the BAAQMD's jurisdiction.

The NOP/IS identified the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality. The following environmental resources were considered to be less than significant in the NOP/IS: aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems (see Appendix A).

1.1.3 TYPE OF EIR

In accordance with §15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that: “will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.”

The EIR is an informational document for use by decision-makers, public agencies and the general public. The proposed project requires discretionary approval and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

The focus of this EIR is to address the environmental impacts of the proposed project as identified in the NOP and Initial Study (included as Appendix A of this EIR). The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the level of information regarding potential impacts from the adoption of Regulation 6, Rule 3, is relatively general at this time, the environmental impact forecasts are also general or qualitative in nature.

1.1.4 INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers, and the public generally, of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this EIR is intended to: (a) provide the BAAQMD Governing Board and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the BAAQMD Governing Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) require a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the EIR in their decision-making;
2. A list of permits and other approvals required to implement the project; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Other local public agencies, such as cities, county planning commissions, etc., may use the EIR for the purpose of developing projects consistent with Regulation 6, Rule 3 if local building permits are required. No other permits will be required by single purpose public agencies.

1.1.5 AREAS OF CONTROVERSY

In accordance to CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. Several areas of controversy have been expressed during public workshops or in the letter received on the NOP.

Concerns that the rule could create extra fuel load for wildland fires were raised during public meetings. No increase in hazards related to wildfires is anticipated from the proposed rule which would apply to existing structures utilizing compliant wood-burning devices. The proposed rule will not create new residential or commercial land use projects. Any new development that might occur in the District would occur for reasons other than the proposed rule. New land use projects would require a CEQA analysis that would evaluate wildfire risks. Mitigation measures would be required to reduce impacts to the maximum extent feasible if the analysis determined such risks to be significant. Proposed Rule 6-3 is not expected to reduce the amount of brush cleared in wildfire hazard areas as the brush clearing is generally required for compliance with fire codes. The burning of brush in wood burning devices under proposed Rule 6-3 could still be accomplished, as long as the brush is seasoned and not burned on curtailment days. The proposed rule does not prevent the California Department of Forestry and Fire Protection (CAL FIRE) or fire districts from conducting controlled burns on non-curtailment days. CAL FIRE is subject to the limitations in Regulation 5: Open Burning. The only change to Regulation 5 would limit recreational fires on curtailment days. Curtailment days only occur about 20 days a year so burning would be allowed on most days (about 345) of the year. In addition, wood can be disposed of in other manners other than burning, such as mulching or chipping. Most wood brush from private property that would be burned is seasoned before burning to produce a desirable (hot) fire. As Rule 6-3 would only provide minor and sporadic delays in burning, no significant impacts are expected.

There is some uncertainty in the appropriate analysis of greenhouse gas emissions from the burning of wood and the comparison to the combustion of natural gas. To respond to this uncertainty, emission estimates for greenhouse gases are evaluated using several different methodologies.

1.1.6 PROJECT OBJECTIVES

CEQA Guidelines §15124(b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed Regulation 6, Rule 3 are summarized in the following bullet points.

- reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area;
- reduce wintertime peak concentrations to attain the federal particulate matter less than 2.5 microns in diameter (PM2.5) standard; and
- further reduce emissions of particulate matter to comply with the State particulate matter less than 10 microns in diameter (PM10) and PM2.5 standards.

1.1.7 DOCUMENT FORMAT

State CEQA Guidelines outline the information required in an EIR, but allow the format of the document to vary [CEQA Guidelines §15120(a)]. The information in the EIR complies with CEQA Guidelines §15122 through §15131 and consists of the following:

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Environmental Setting, Impacts and Mitigation Measures

Chapter 4: Alternatives

Chapter 5: Other CEQA Topics

Chapter 6: References

Chapter 7: Acronyms

Appendix A: Notice of Preparation/Initial Study

1.2 EXECUTIVE SUMMARY OF DRAFT EIR

1.2.1 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

Regulation 6, Particulate Matter and Visible Emissions, Rule 3, Wood-Burning Devices is a proposed new rule initiated by the District’s Particulate Matter Implementation Schedule. It is intended to reduce emissions from wood-burning devices in residences and businesses by curtailing burning during specific periods and regulating fuels and materials to be used in wood-burning devices.

A wood-burning device is any indoor wood-burning stove or insert, pellet-fueled device, conventional fireplace and/or any indoor permanently-installed device burning solid-fuel for aesthetic or space-heating purposes in structures for residential or commercial use. Proposed Rule 6-3 for control of wood-burning devices would:

- Curtail operation of any wood-burning device during periods forecast to negatively impact public health due to PM2.5 levels.
- Establish limitations on visible emissions from wood burning.
- Establish criteria for the sale, transfer or installation of wood-burning devices.
- Establish criteria for the installation of wood-burning devices in new building construction.
- Prohibit the burning of garbage and certain types of materials.
- Establish requirements for the sale of wood products for use in wood burning devices.
- The proposal to amend Regulation 5, Open Burning, would create only a limited exemption for outdoor fires set for recreational purposes which would require curtailment during periods forecast to negatively impact public health due to PM2.5 levels.
- The proposal to amend Regulation 1, General Provisions and Definitions, would remove the language “residential heating” to allow for the regulation of indoor wood-burning devices.

1.2.2 EXECUTIVE SUMMARY – CHAPTER 3: ENVIRONMENTAL SETTINGS, IMPACTS AND MITIGATION MEASURES

1.2.2.1 Air Quality

Environmental Setting

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal

government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide (SO₂) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically. The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO_x), and sulfur dioxides (SO₂). The Air District is not considered to be in attainment with the State PM₁₀ and PM_{2.5} standards. The Bay Area is designated as a marginal non-attainment area for the federal 8-hour ozone standard and as a serious non-attainment area for the California 1-hour ozone standard. The District has been designated as non-attainment for the new State 8-hour standard.

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials, generates more particulate matter, carbon monoxide, and increases toxic compounds. Residential wood combustion is an important contributor to ambient fine particle levels in the United States.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. The total annual emissions from both wood stoves (1,657 tons per year (tpy)) and fireplaces (5,037 tpy) is estimated to be 6,694 tpy of PM₁₀. The total annual emissions from both wood stoves (1,591 tpy) and fireplaces (4,836 tpy) is estimated to be 6,427 tpy of PM_{2.5}.

Environmental Impacts

Proposed Rule 6-3 would not generate any new construction. Rule 6-3 proposes that new or used wood stoves sold or installed in the Bay Area would be required to meet EPA Phase II standards for wood burning devices. In addition, new commercial and residential buildings would not be allowed to be constructed with wood burning devices that are not Phase II, pellet or equivalent devices. Natural gas-burning fireplaces or conventional fireplaces with natural gas inserts would be allowed. Therefore, Rule 6-3 is not expected to require or generate additional construction activities or additional construction emissions.

Operational Emission Impacts: The overall objective of the proposed project is to reduce PM₁₀ and PM_{2.5} emissions from wood burning devices. The operational PM₁₀ and PM_{2.5} emission reductions were estimated according to the methodology developed

in the Staff Report (BAAQMD, 2007). The overall emission reductions are expected to be in the range of 263 to 917 tpy of PM₁₀ and 254 to 887 tpy of PM_{2.5}, providing an overall beneficial impact on air quality.

Since Rule 6-3 compliant wood burning devices are more efficient, requiring the sale, transfer and installation of only EPA Phase II certified, pellet or equivalent devices would reduce the amount of air toxics emitted. Natural gas is a cleaner burning fuel than wood; therefore, the installation or replacement of pre-EPA approved devices with natural gas appliances would reduce toxic emissions. Therefore, Rule 6-3 is expected to provide beneficial impacts on toxic air contaminants and related beneficial health impacts.

Cumulative Impacts

Criteria and Toxic Air Contaminants: Cumulative air quality impacts on criteria and toxic air contaminants due to implementation of proposed Rule 6-3 and all air pollution control rules currently being developed, considered together, are not expected to be significant because implementation of all control measures is expected to result in net emission reductions and overall air quality improvement. Implementation of Rule 6-3 will result in reductions in emissions of PM₁₀, PM_{2.5}, and toxic air contaminants, providing a cumulative air quality and public health benefit. Therefore, no significant adverse cumulative air quality impacts related to criteria and toxic air contaminants are expected.

Greenhouse Gases: Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of Greenhouse Gases (GHG) in the atmosphere.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG. As reported by the CEC, California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions. Approximately 80 percent of GHG in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions.

Depending on the assumptions used and whether or not direct emissions or life cycle emissions are estimated, there is a wide variability in terms of the potential GHG emissions resulting from implementing Rule 6-3. Based on the best available studies and available information about firewood used in the Bay Area, the imposition of a curtailment requirement on some days during the winter season is not expected to result in an increase in GHG emissions.

1.2.3 EXECUTIVE SUMMARY – CHAPTER 4: ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR and the Initial Study (see Appendix A), the proposed new rule is not expected to result in significant impacts to any environmental resources including aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems. Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR. The requirement to develop alternatives under CEQA Guidelines §15126.6 has been satisfied because no significant adverse impacts were identified for the proposed project. No further discussion of alternatives is required for this EIR.

1.2.4 EXECUTIVE SUMMARY – CHAPTER 5: OTHER CEQA TOPICS

1.2.4.1 Relationship Between Short-term Uses and Long-Term Productivity

Implementing Rule 6-3 is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. Of the potential environmental impacts discussed in Chapter 3, no significant adverse impacts were identified. The purpose of the proposed rule is to reduce emissions of particulate matter and visible emissions (as well as toxic air contaminants and other criteria pollutants), particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for PM10 and PM2.5. By reducing particulate matter and visible emissions, human exposure to air pollutants would also be reduced, providing long-term health benefits. Therefore, no short-term benefits at the expense of long-term impacts have been identified due to implementation of the proposed rule.

Because no short-term environmental benefits are expected at the expense of long-term environmental goals being achieved, there is no justification for delaying the proposed action. The proposed project should be implemented now as the District is required to make progress toward attaining state and federal particulate matter standards, and has identified it as a control measure in accordance with requirements of Senate Bill 656 (SB 656, Sher).

1.2.4.2 Significant Irreversible Environmental Changes

Implementation of the proposed rule is not expected to result in significant irreversible adverse environmental changes. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. Cumulative air quality impacts are expected to be less than significant as implementation of the proposed rule will result in overall emission reductions of PM10 and PM2.5, as

well as TACs, other criteria pollutants, and GHG. Proposed Rule 6-3 is expected to result in long-term benefits associated with improved air quality even though the use of natural gas in the Bay Area may increase. The project would result in reduced emissions, thereby improving air quality and related public health.

1.2.4.3 Growth-Inducing Impacts

Growth-inducing impacts can generally be characterized in three ways: (1) a project includes sufficient urban infrastructure to result in development pressure being placed on less developed adjacent areas; (2) a large project affects the surrounding community by producing a “multiplier effect,” which results in additional community growth; and (3) a new type of development is allowed in an area, which subsequently establishes a precedent for additional development of a similar character. None of the above scenarios characterize the project evaluated in the EIR since it will control emissions from wood-burning devices.

1.2.5 EXECUTIVE SUMMARY – CHAPTERS 6 AND 7: REFERENCES AND ACRONYMS

Information on references cited (including organizations and persons consulted) and the acronyms are presented in Chapters 6 and 7, respectively.

CHAPTER 2

PROJECT DESCRIPTION

Introduction
Project Location
Background
Project Objective
Proposed Project

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Regulation 6, Particulate Matter and Visible Emissions, Rule 3, Wood-Burning Devices is a proposed new rule initiated by the Bay Area Air Quality Management District (BAAQMD) and is included as part of the District's Particulate Matter Implementation Schedule. The purpose of the rule is to limit emissions of particulate matter and visible emissions from wood-burning devices as part of an overall wood smoke reduction program within the jurisdiction of the BAAQMD. Minor changes in current Regulation 1 and Regulation 5 are required as they are necessary to accomplish the associated reductions.

Particulate matter consists of very small liquid and solid particles suspended in the air, and includes particulate matter less than 10 microns equivalent aerodynamic diameter (PM10) as well as finer particulate matter less than 2.5 microns equivalent aerodynamic diameter (PM2.5). Particulate matter is of concern because it can cause serious health effects. People with respiratory illnesses, children, and the elderly are more sensitive to the effects of particulate matter, but it can affect everyone.

The Bay Area experiences its highest particulate matter concentrations in the winter, especially during the evening and night time hours. Wood-burning is the single greatest source contributing to the particulate matter concentrations, based on chemical composition analysis of deposited airborne particulate matter. Emissions calculations indicate wood smoke contributes only about 10 percent of total particulate matter emissions on an annual basis, but approximately 30 percent of total wintertime PM2.5.

During recent winters, the Bay Area Air District exceeded the 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) 20 to 30 days. The BAAQMD staff anticipates a non-attainment designation for this newly revised standard. The emission limitations in this proposed rule are intended to address this expected non-attainment status and reduce the health impacts of particulate matter in the Bay Area. Reductions in wood smoke emissions will be necessary to achieve clean air on a district-wide basis.

The proposed rule would reduce wintertime PM2.5 levels by curtailing wintertime wood-burning emissions from wood-burning devices, including fireplaces, and achieve additional reductions by requiring cleaner burning technologies in new construction. In addition, non-wintertime burning will be improved by requiring appropriate fuel with low-moisture content be used throughout the year in wood-burning devices. Currently, there is no Air District rule which directly limits emissions from wood-burning devices. Air District Regulation 1 has historically excluded regulation of any fires associated with residential heating and will be amended to remove this exclusion. An amendment to existing Regulation 5, Open Burning, will remove an exemption for outdoor fires set for recreational purposes and create a similar requirement to curtail wintertime wood burning outdoors as well as indoors when air quality conditions dictate.

A wood-burning device is any indoor wood-burning stove or insert, pellet-fueled device, conventional fireplace and/or any indoor permanently-installed device burning solid-fuel for aesthetic or space-heating purposes in structures for residential or commercial use. The proposal for wood-burning devices would:

- Curtail operation of any wood-burning device during periods forecast to negatively impact public health due to PM2.5 levels;
- Establish limitations on visible emissions from wood burning;
- Establish criteria for the sale, transfer or installation of wood-burning devices;
- Establish criteria for the installation of wood-burning devices in new building construction;
- Prohibit the burning of garbage and certain types of materials;
- Establish requirements for the sale of wood products for use in wood burning devices.
- The proposal to amend Regulation 5, Open Burning, would create only a limited exemption for outdoor fires set for recreational purposes which would require curtailment during periods forecast to negatively impact public health due to PM2.5 levels in ambient air.
- The proposal to amend Regulation 1, General Provisions and Definitions, would remove the language “residential heating” to allow for the regulation of indoor wood-burning devices.

2.2 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2-1).

2.3 BACKGROUND

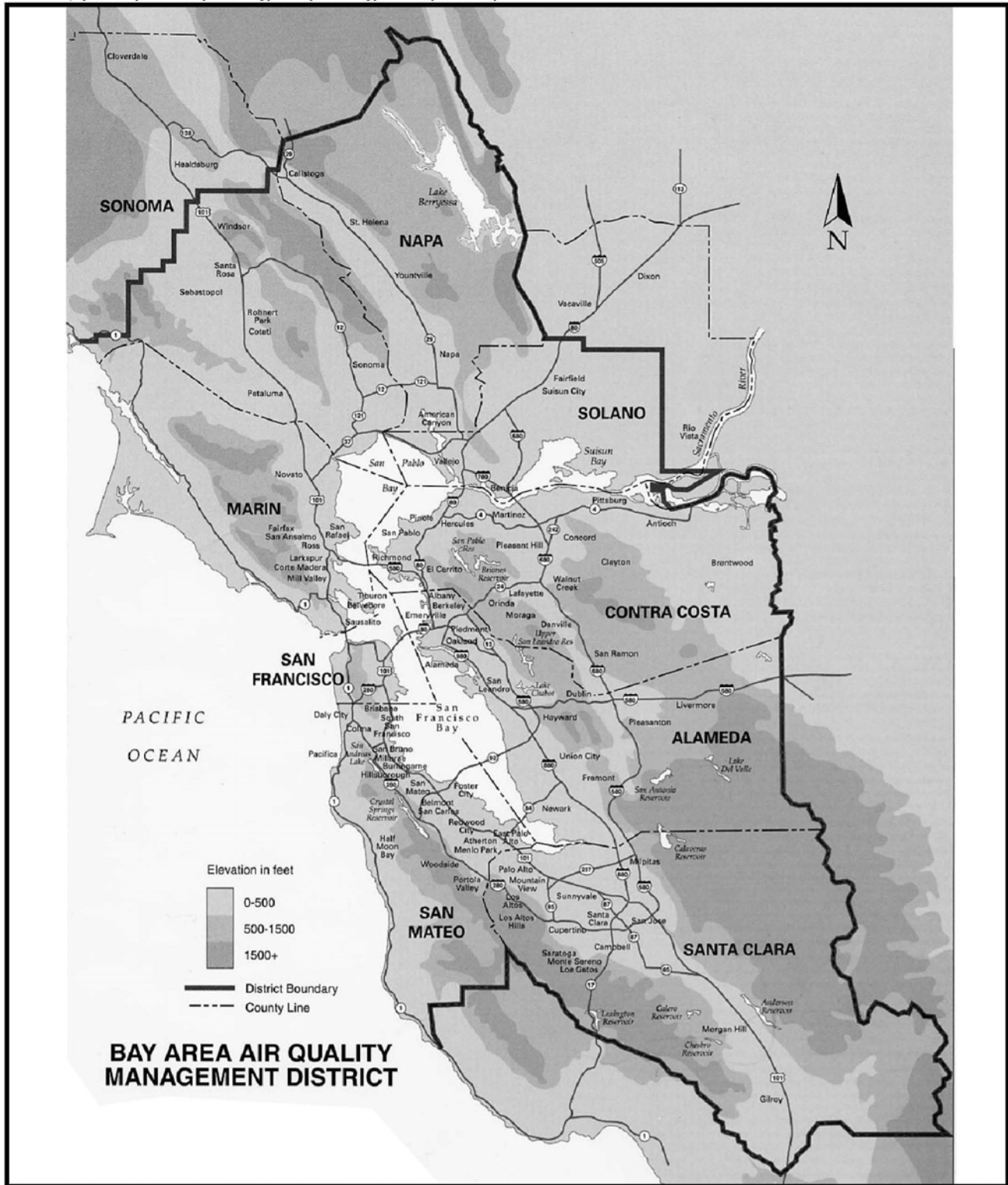
The Bay Area Air Quality Management District (BAAQMD) is proposing adoption of Regulation 6, Particulate Matter and Visible Emissions, Rule 3 Wood-Burning Devices (Rule 6-3). This proposed rule would control air pollution from wood-burning stoves, fireplaces and heaters, including wood pellet stoves. The BAAQMD proposes adoption of Rule 6-3 to reduce emissions of particulate matter and visible emissions, particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for fine particulate matter, or particulate matter of 2.5 microns diameter or less (PM_{2.5}). The national 24-hour standard for fine particulate matter in ambient air was lowered from 65 micrograms/cubic meter ($\mu\text{g}/\text{m}^3$), to 35 $\mu\text{g}/\text{m}^3$, in December 2006.

Currently, fireplaces and wood stoves used to heat residences are exempt from District rules by Regulation 1, Section 110.4. However, from time to time the District receives complaints about residential wood-burning devices, such as excessive smoke and odor. The District's regulations of general applicability, such as Regulation 6 - Particulate Matter and Visible Emissions, and Regulation 7 - Odorous Substances, and the public nuisance standard in Regulation 1 do not apply. District inspectors respond to such complaints with informational literature advising residents of the dangers of particulate matter and how to burn with a minimum of smoke.

The District also has a voluntary program to minimize particulate matter emissions from wood-burning devices, called Spare the Air Tonight (STAT). The STAT program asks residents, via e-mail, the District website and press releases to radio and TV, not to burn during predicted excesses of the 35 $\mu\text{g}/\text{m}^3$ standard for PM_{2.5} in ambient air. The STAT season runs from mid-November through mid-February, and has been active since 1991. Typically, there are between 20 and 30 STAT nights, however, during the 2007-2008 season, there were only six. The District has averaged 17 STAT nights in the past five years. During the STAT season, the District follows up with surveys to determine the amount of success of the voluntary program and public attitudes and behaviors associated with wood burning.

In addition, the District has promoted a model ordinance to cities and counties that contains various elements that can reduce particulate matter from wood smoke. The ordinance serves as a template or guidance document for cities and counties that wish to regulate sources of particulate matter in their communities. The model ordinance does not ban wood burning in fireplaces but seeks to take advantage of new, cleaner technologies that have been developed to effectively reduce wood smoke pollution. The model ordinance includes options for mandatory burning curtailments on STAT nights, a requirement that new or re-modeled homes contain only EPA Phase II certified devices, a prohibition on gas to wood heating conversion and limitations on fuel that can be burned.

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 Environmental Audit, Inc.

 NOT TO SCALE

LOCATION OF BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Figure 2-1

When a city or a county adopts all or only parts of the model wood smoke ordinance, enforcement typically takes place through the permit process at local building departments. The ordinance requires residents to provide documentation that the device to be installed is allowed by the ordinance. To date, 41 Bay Area cities and eight counties have adopted aspects of this model ordinance, including a mix of voluntary and mandatory standards.

Finally, the District co-sponsored and managed a financial incentive, or “wood stove change-out”, program in Santa Clara County as part of an air quality mitigation program required by the California Energy Commission. Rebates were offered to residents to upgrade to cleaner burning wood-burning devices. The District’s Cleaner Burning Technology Incentives Program offered a similar District-wide incentive program in 2008.

Wood stoves are wood-burning devices that are enclosed to control combustion. EPA-certified stoves employ either a catalytic or non-catalytic system to increase combustion of the exhaust stream. These units are either stand alone or installed into a building’s walls. A wood-burning insert can be placed in either a new or an existing fireplace.

Some EPA-certified stoves utilize a catalyst to reduce the ignition temperature of volatile gases resulting from wood combustion. A catalyst in a stove is a ceramic honey-combed combustor that is coated with a noble metal, such as platinum or palladium. These types of stoves require maintenance and eventually catalyst replacement during the lifetime of the stove in order to operate properly. The EPA Phase II certification emission limit for catalytic stoves is 4.1 grams per hour (g/hr).

Non-catalytic stoves, on the other hand, achieve low-emission, cleaner burning by decreasing the firebox size, increasing turbulence (mixing) within the firebox, and adding baffles as well as secondary burn tubes to combust emission gases. These stoves still require maintenance to operate effectively, but do not have a catalyst to replace. The EPA certification emission limit for non-catalytic stoves is 7.5 g/hr.

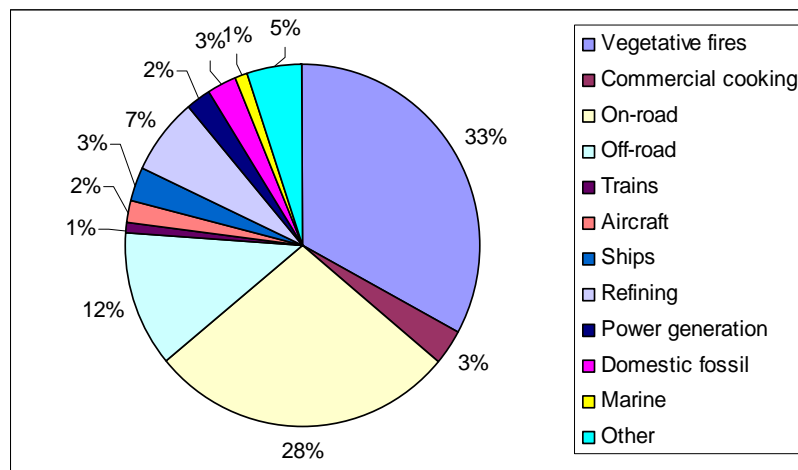
Pellet stoves were developed during the 1970’s to develop alternatives to fossil fuel. These devices burn pellets very cleanly and do not require EPA certification, although many manufacturers have the devices certified by the EPA. Pellet stoves burn wood that has been compressed into pellet form for combustion and easy storage. Some pellet stoves burn products other than wood, such as wheat or corn. In addition to the need to be vented to the outside of the structure, pellet stoves require electricity to operate in order to utilize active air and fuel management systems to control combustion efficiency. Some pellet stoves cannot meet the EPA certification requirements due to excessive air-to-fuel ratios. These stoves, however, are efficient and clean burning.

A masonry heater is a site-built, or site-assembled, solid-fueled heating device consisting of a firebox, a large masonry mass, and a maze of heat exchange channels. While a masonry heater may look like a fireplace, it operates differently. It stores heat from a rapidly burning fire within its masonry structure, and slowly releases the heat over time.

These devices currently do not require EPA-certification.

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33 percent) to PM2.5 in the Bay Area, as shown in Figure 2-2.



Note: Smoke from residential wood burning constitutes nearly all of the vegetative fires category during peak periods. The other major contributors, agricultural and wildland management burns, are prohibited under District Regulation 5 during “no-burn” days, when peak concentrations occur.

FIGURE 2-2: PM2.5 Concentration on Peak Days by Constituent in the Bay Area.

Other studies find results and trends that support emission inventory estimates derived from the District data. The California Air Resources Board (CARB) found (Magliano, 1999) that residential wood combustion makes up 20 percent to 35 percent of wintertime particulate matter.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a particulate matter 10 microns and below in diameter (PM10) estimate for each county in the Bay Area. Wood stoves and fireplaces are expected to generate 1,657 tons per year (tpy) and 5,037 tpy of PM10 emissions, respectively. Wood stoves and fireplaces are expected to generate 1,591 tpy and 4,836 tpy of PM2.5 emissions, respectively (see Chapter 3 for further details). Because the category of

PM10 also includes PM2.5, a large portion of PM10 particles are also PM2.5 particles. Therefore, the majority of particulate matter from wood smoke are fine particles. It is these fine particles that are of greatest concern to public health.

2.4 PROJECT OBJECTIVES

The objective of Rule 6-3 is to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the federal PM2.5 standard. The Bay Area is also not in attainment with the State particulate matter standards, so further reductions in emissions of particulate matter are needed.

The Bay Area attains the federal annual PM10 standard, but is not in attainment of the California annual PM10 or PM2.5 or the California 24-hour PM10 standard. The Bay Area is unclassified for the federal 24-hour PM10 and new 24-hour PM2.5 standard.

2.5 PROPOSED PROJECT

This section presents the proposed Regulation 6, Rule 3 components to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the federal PM2.5 standard.

Visible Emissions: Rule 6-3 proposes to limit visible emissions from wood-burning devices, except six minutes during any one-hour period, to 20 percent visible emissions (equivalent to 1 on a Ringelmann Scale). This opacity limit would not apply during a 20-minute start-up period for any wood fire. This opacity standard is similar to that required of other District operations from stationary sources, including dust from construction sites and any other regulated sources (20 percent visible emissions except for three minutes in any one-hour period). Failure to meet a visible emissions standard is indicative of poor ventilation to a fire, or poorly seasoned or wet wood. Based on District inspection staff observations, this standard is not difficult to meet for properly maintained and operated wood burning devices.

Prohibit Burning of Garbage: Rule 6-3 proposes to prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, glossy and/or colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device at any time. These materials produce volatile organic compounds (VOCs), particulate matter and toxic compounds.

Labeling: Rule 6-3 proposes to require a label be placed on firewood for sale, including manufactured wood products such as artificial logs and wood pellets. The label would warn consumers about the health impacts from burning wood and where to find out if burning is prohibited. Unseasoned wood (moisture content of greater than 20 percent)

would be required to be labeled as such and contain a notification that burning unseasoned wood is not allowed and provide instructions for seasoning.

Seasoned wood: Rule 6-3 proposes to require that seasoned firewood must have a moisture content of 20 percent or less. Only seasoned wood can be burned in a wood-burning device. Unseasoned firewood may be sold, but must include a warning that it is not legal to burn before seasoning and instructions must be provided for seasoning.

Sale, transfer or installation: Federal law already requires newly manufactured wood stoves to meet EPA Phase II certification standards. Rule 6-3 proposes to require that wood stoves sold, transferred or installed in the District to meet these standards. Stoves sold as part of a house or other real estate transaction would not be affected by this prohibition.

New Construction: Rule 6-3 proposes to allow only EPA certified wood-burning devices or pellet stoves or equivalent devices in new construction. This would prohibit conventional wood-burning fireplaces in new housing developments.

Burning Curtailment: Rule 6-3 proposes to limit the ability to burn on STAT nights, defined as a night when the particulate matter is forecast to exceed the 24-hour National Ambient Air Quality Standard of $35 \mu\text{g}/\text{m}^3$. An exemption would be provided if wood burning was the sole source of heat for a home.

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Introduction
Air Quality

3.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1 INTRODUCTION

A NOP/IS was prepared for Regulation 6: Particulate Matter and Visible Emissions, Rule 3: Wood-Burning Devices and Amendment of Regulation 5: Open Burning and Regulation 1: General Provisions and Definitions on March 10, 2008 (see Appendix A). The NOP/IS identified air quality as the environmental resource to be potentially significant, requiring further analysis in the EIR. The following environmental resources were considered to be less than significant and will not be further evaluated: aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems.

The environmental resource section is organized into the following subsections: (1) Environmental Setting; (2) Thresholds of Significance; (3) Environmental Impacts; and (4) Mitigation Measures. A description of each subsection follows.

3.1.1 Environmental Setting

CEQA Guidelines §15125 requires that an EIR include a description of the physical environmental conditions in the vicinity of the proposed project as they exist at the time the NOP/IS is published, or if no NOP/IS is published, at the time the environmental analysis is commenced, from both a local and regional perspective. This Chapter describes the existing environment in the Bay Area as they exist at the time the NOP/IS was prepared (March 2008). The environmental topics identified in this Chapter include both a regional and local setting. The analysis included in this chapter focus on those aspects of the environmental resource areas that could be adversely affected by the implementation of the proposed project (implementation of Regulation 6, Rule 3 and amendment of Regulations 5 and 1) as determined in the NOP/IS (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project.

3.1.2 Thresholds of Significance

This section identifies the criteria used to determine when physical changes to the environment created as a result of the project approval would be considered significant. The levels of significance for each environmental resource were established by identifying significance criteria. These criteria are based upon those presented in the California Environmental Quality Act (CEQA) environmental checklist and the BAAQMD's CEQA Guidelines (BAAQMD, 1999).

The significance determination under each impact analysis is made by comparing the proposed project impacts with the conditions in the environmental setting and comparing the difference to the significance criteria.

3.1.3 Environmental Impacts

The potential impacts associated with each discipline are either quantitatively analyzed where possible or qualitatively analyzed where data were insufficient to quantify impacts. The impacts are compared to the significance criteria to determine the level of significance.

The impact sections of this chapter focus on those impacts that are considered potentially significant per the requirements of the California Environmental Quality Act. An impact is considered significant if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following categories:

Beneficial – Impacts will have a positive effect on the resource.

No Impact: There would be no impact to the identified resource as a result of the project.

Less Than Significant: Some impacts may result from the project; however, they are judged to be less than significant. Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource. A "less than significant impact" applies where the environmental impact does not exceed the significance threshold.

Potentially Significant But Mitigation Measures Can Reduce Impacts to Less Than Significant: Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to less than significant.

Potentially Significant or Significant Impacts: Adverse impacts may occur that would be significant even after mitigation measures have been applied to minimize their severity. A "potentially significant or significant impacts" applies where the environmental impact exceeds the significance threshold, or information was lacking to make a finding of insignificance.

3.1.4 Mitigation Measures

This section describes feasible mitigation measures that could minimize potentially significant or significant impacts that may result from project approval. CEQA Guidelines (§15370) defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

In accordance with CEQA statutes (§21081.6), a mitigation and monitoring program would be required to be adopted to demonstrate and monitor compliance with any mitigation measures identified in this EIR. The program would identify specific mitigation measures to be undertaken, when the measure would be implemented, and the agency responsible for oversight, implementation and enforcement.

3.2 AIR QUALITY

3.2.1 ENVIRONMENTAL SETTING

The NOP/IS (see Appendix A) determined the air quality impacts of proposed Rule 6-3 as having the potential for significant adverse impacts. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (criteria air pollutants; toxic air contaminants, TACs; and greenhouse gas emissions, GHG) have been evaluated in this EIR.

3.2.1.1 Criteria Air Pollutants

Ambient Air Quality Standards

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide (SO₂) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards, and in the cases of PM₁₀ and SO₂, far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The state and National Ambient Air Quality Standards (NAAQS) for each of these pollutants and their effects on health are summarized in Table 3-1. CO, NO₂, PM₁₀, PM_{2.5} and SO₂ are directly emitted from stationary and mobile sources. Ozone is not

emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons or reactive organic hydrocarbons (ROG, also commonly referred to as volatile organic compounds or VOCs).

U.S. EPA requires CARB and BAAQMD to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the BAAQMD monitors levels of various criteria pollutants at 26 monitoring stations. The 2006 air quality data from the BAAQMD monitoring stations are presented in Table 3-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO_x), and sulfur dioxides (SO₂). The Air District is not considered to be in attainment with the State PM₁₀ and PM_{2.5} standards.

The 2006 air quality data from the BAAQMD monitoring stations are presented in Table 3-2. All monitoring stations were below the state standard and federal ambient air quality standards for CO, NO₂, and SO₂. The federal 8-hour ozone standard was exceeded 12 days in the District in 2006, while the state 1-hour standard was exceeded on 22 days. The Bay Area is designated as a marginal non-attainment area for the federal 8-hour ozone standard and as a serious non-attainment area for the California 1-hour ozone standard. The State 1-hour ozone standard was exceeded on 18 days in 2006 in the District, most frequently in the Eastern District (Livermore) (see Table 3-2). The District has been designated as non-attainment for the new State 8-hour standard.

TABLE 3-1: Federal and State Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.08 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 µg/m ³ , annual arithmetic mean > 50 µg/m ³ , 24-hr average>	50 µg/m ³ , annual arithmetic mean > 150 µg/m ³ , 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 µg/m ³ , annual arithmetic mean>	15 µg/m ³ , annual arithmetic mean> 35 µg/m ³ , 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m ³ , 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m ³ , 30-day avg. >=	1.5 µg/m ³ , calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

CHAPTER 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

TABLE 3-2
Bay Area Air Pollution Summary – 2006

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM ₁₀				PM _{2.5}				
	Max 1-hr	Cal Days	Max 8-hr	Nat Days	Cal Days	3-Yr Avg	Max 1-hr	Max 8-hr	Nat/Cal Days	Max 24-hr	Ann Avg	Nat/Cal Days	Max 24-hr	Ann Avg	Nat/Cal Days	Ann Avg	Max 24-hr	Nat Days	Cal Days	Max 24-hr	Nat Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)			(ppb)			(µg/m ³)				(µg/m ³)				
Napa	96	1	72	0	2	60	3.5	2.8	0	3.5	11	0	-	-	-	21.9	52	0	1	-	-	-	-	-
San Rafael	89	0	58	0	0	50	2.6	1.5	0	2.6	14	0	-	-	-	18.1	68	0	1	-	-	-	-	-
Santa Rosa	77	0	58	0	0	47	2.4	1.7	0	2.4	11	0	-	-	-	18.8	90	0	2	59.0	1	28.7	9.2	8.3
Vallejo	80	0	69	0	0	57	3.7	2.9	0	3.7	12	0	4	1.0	0	19.8	50	0	0	42.2	1	35.6	9.8	10.2
Coast/Central Bay																								
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	6	1.6	0	-	-	-	-	-	-	-	-	-
San Francisco	53	0	46	0	0	45	2.7	2.1	0	107	16	0	6	1.3	0	22.9	61	0	3	54.3	3	30.9	9.7	9.7
San Pablo	61	0	50	0	0	48	2.5	1.4	0	55	13	0	5	1.6	0	21.3	62	0	2	-	-	-	-	-
Eastern District																								
Bethel Island	116	9	90	1	14	73	1.3	1.0	0	44	8	0	7	2.1	0	19.4	84	0	1	-	-	-	-	-
Concord	117	8	92	4	14	74	1.7	1.3	0	47	11	0	7	0.8	0	18.5	81	0	3	62.1	5	35.0	9.3	9.7
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	8	1.8	0	-	-	-	-	-	-	-	-	-
Fairfield	106	3	87	1	8	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	127	13	101	5	15	80	3.3	1.8	0	64	14	0	-	-	-	21.8	69	0	3	50.8	3	33.5	9.8	9.7
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	7	1.9	0	-	-	-	-	-	-	-	-	-
Pittsburg	105	3	93	1	10	70	3.3	1.9	0	52	11	0	9	2.4	0	19.9	59	0	2	-	-	-	-	-
South Central Bay																								
Fremont	102	4	74	0	3	60	2.9	1.8	0	63	15	0	-	-	-	20.0	57	0	1	43.9	2	30.3	10.3	9.6
Hayward	101	2	71	0	1	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	85	0	63	0	0	53	5.5	2.4	0	69	14	0	-	-	-	19.8	70	0	2	75.3	1	29.4	9.6	9.2
San Leandro	88	0	66	0	0	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Santa Clara Valley																								
Gilroy	120	4	101	2	8	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Los Gatos	116	7	87	4	11	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose Central	118	5	87	1	5	63	4.1	2.9	0	74	18	0	-	-	-	21.0	73	0	2	64.4	6	38.5	10.8	11.4
San Jose, Tully Rd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.0	106	0	13	30.6	0	-	-	-
San Martin	123	7	105	5	11	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunnyvale	106	3	78	0	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		18		12	22				0			0			0			0	15		10			

(ppm) = parts per million, (pphm) = parts per hundred million, (ppb) = parts per billion

All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standards were exceeded on 15 days in 2006, most frequently in San Jose. The Air District exceeded the federal PM2.5 standard on ten days, most frequently in San Jose, in 2006 (see Table 3-2).

3.2.1.2 Non-Criteria Pollutants

Although the primary mandate of the BAAQMD is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. The state and federal governments have set health-based ambient air quality standards for criteria pollutants. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to TACs.

The major elements of the District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with non-trivial TAC emissions to use the Best Available Control Technology.
- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of TACs, to report significant emissions to the affected public, and to reduce unacceptable health risks.
- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the state Toxic Air Contaminant Act and the federal Clean Air Act.
- The TAC emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.
- Ambient monitoring of TAC concentrations at a number of sites throughout the Bay Area.
- The Community Air Risk Evaluation (CARE) Program evaluates and reduces emissions of TACs in high risk communities.

Historically, the BAAQMD has regulated criteria air pollutants using either a technology-based or an emissions-limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs requires a different regulatory approach as explained in the following subsections.

Air Toxics New Source Review

New and modified source permit applications have been reviewed for air toxics concerns since 1987, in accordance with the Risk Management Policy (RMP) established at the

request of the District's Board of Directors. A large increase in risk screening analyses has occurred in recent years due primarily to the removal of permit exemptions in District regulations for standby engines. Prior to 2000, the District completed screening risk analyses for an average of about 175 permit applications per year. This number increased to 255 in 2000, to 440 in 2001, reached a peak of 602 in 2002, and declined to 430 in 2003. The District has replaced the RMP with Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, which was adopted by the District Board of Directors on June 15, 2005.

Regulation 2, Rule 5 changed the Air Toxics NSR Program by:

- (1) adding a project risk limit for acute health risks (HI = 1.0);
- (2) requiring TBACT for chronic non-cancer health risks (at HI > 0.20);
- (3) using updated toxicity values and exposure assessment procedures (primarily from OEHHA Air Toxic Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment);
- (4) removing “special” project cancer risk limits for perchloroethylene dry cleaners; and
- (5) eliminating discretionary risk authority for the Air Pollution Control Officer; all sources are limited to cancer risk of 10 in a million and non-cancer Hazard Index of 1.0.

Air Toxics Hot Spots Program

The Air Toxics Hot Spots (ATHS) Program involves the evaluation of health risks due to routine and predictable TAC emissions from industrial and commercial facilities. The District has established specific public notification measures for various levels of risk identified under the program (Levels 1, 2, and 3). In 1991, the first year of the risk assessment phase of the program, 30 facilities were identified with Level 1 health risks (cancer risk of 10 in a million or greater) that triggered public notification requirements. The number of facilities requiring public notification had steadily decreased over the first decade of the program as industries reduced toxic emissions and refined estimates of risk. There are currently no major facilities in the Bay Area that require public notification under the ATHS Program. In addition to public notification requirements, the ATHS Program requires facilities to reduce their health risks below levels determined by the air district to be significant within a certain timeframe. The District requires mandatory risk reduction measures for those facilities with health risks of Level 2 or greater (cancer risks of 100 in one million or greater). There are currently no facilities in the Bay Area that have risks identified as Level 2 or greater.

Control Measures for Categories of Sources

The California Air Resources Board (CARB) has adopted seventeen Airborne Toxic Control Measures (ATCMs) for stationary sources which the District implements in the

Bay Area. More recent ATCMs include residential waste burning (2003), stationary diesel engines (2004), portable diesel engines (2004), thermal metal spraying (2005), and formaldehyde from composite wood products (2007). CARB revised existing ATCMs for chrome plating and chromic acid anodizing operations and perchloroethylene dry cleaners (included a phase-out of perchloroethylene by 2023).

National Emission Standards for Hazardous Air Pollutants (NESHAPs) developed by U.S. EPA in accordance with Title III of the 1990 federal Clean Air Act Amendments have also become an important source of air toxics control measures in California. These rules generally focus on larger “major source” facilities, and require that emissions be reduced using the Maximum Achievable Control Technology (MACT). Under State law, the District must implement and enforce all MACT Standards, or rules that are at least as stringent. U.S. EPA has already adopted a significant number of new MACT Standards. The focus of future NESHAP development under Title III has shifted to rules that apply to smaller “area source” facilities, e.g., EPA revised the Perchloroethylene Dry Cleaning MACT in July 2006.

Air Toxics Emission Inventory

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed emissions inventory is reported in the BAAQMD, Toxic Air Contaminant Control Program, 2003 Annual Report (BAAQMD, 2007). The 2003 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area. The most dramatic emission reductions in recent years have been for certain chlorinated compounds that are used as solvents including 1,1,1-trichloroethane, perchloroethylene, and trichloroethylene. Additionally, in 2003, there were reductions in other organic TACs such as: toluene, xylene, butyl cellosolve, glycol ethers, and methyl ethyl ketone.

Targeted Control of TACs Under the Community Air Risk Evaluation Program:

In 2004, BAAQMD established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, BAAQMD will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Ambient Monitoring Network

Table 3-3 (BAAQMD, 2007) contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2003. Table 3-3 show the calculated cancer risks associated with lifetime exposure to average ambient concentrations of these measured TACs. Of the pollutants for which monitoring data are available, 1,3-butadiene and benzene (which are emitted primarily from motor vehicles) account for slightly over one half of the average calculated cancer risk.

Ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline, with significant reductions in ambient 1,3-butadiene levels also occurring. Due largely to these observed reductions in ambient benzene and 1,3-butadiene levels, the calculated network average cancer risk has been significantly reduced in recent years. Based on 2003 ambient monitoring data, the calculated inhalation cancer risk is 143 in one million, which is 53 percent less than the 303 in one million risk that was observed in 1995. These figures do not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored. Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (approximately 500-700 in a million) that is greater than all of the other measured TACs combined. CARB began monitoring for acrylonitrile mid-2003; ambient concentration data will be included for 2004 and in later reports.

TABLE 3-3: Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data

Compound	LOD (ppb) ⁽¹⁾	% of Samples < LOD ⁽²⁾	Max. Conc. (ppb) ⁽³⁾	Min. Conc. (ppb) ⁽⁴⁾	Mean Conc. (ppb) ⁽⁵⁾
Acetone	0.30	0	121.4	0.6	6.80
Benzene	0.10	1.78	2.4	0.5	0.401
1,3-butadiene	0.15	75.7	0.89	0.075	0.12
Carbon tetrachloride	0.01	0	0.16	0.09	0.108
Chloroform	0.02	62.5	1.47	0.01	0.024
Ethylbenzene	0.10	44.2	0.90	0.05	0.135
Ethylene dibromide	0.02	100	0.01	0.01	0.01
Ethylene dichloride	0.10	100	0.05	0.05	0.05
Methylene chloride	0.50	82.9	3.40	0.25	0.356
Methyl ethyl ketone	0.20	7.7	5.80	0.1	0.496
Metyl tert-butyl ether	0.30	32.9	4.80	0.15	0.532
Perchloroethylene	0.01	42.4	0.28	0.005	0.026
Toluene	0.10	0.2	6.0	0.05	1.062
1,1,1-Trichloroethane	0.05	72.3	2.47	0.025	0.084
Trichloroethylene	0.05	93.8	0.33	0.025	0.029
Trichlorofluoromethane	0.01	0	.046	0.18	0.266
1,1,2-trichlorotrifluoroethane	0.01	0	1.16	0.06	0.077
Vinyl chloride	0.30	100	0.15	0.15	0.15
m/p-xylene	0.10	2.8	3.40	0.05	0.535
o-xylene	0.10	27.9	1.30	0.05	0.186

NOTES: Table 4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2003. These data represent monitoring results at 19 of the 20 separate sites at which samples were collected. Data from the Fort Cronkhite "clean-air" background site was not included. Data from the Oakland-Davie Stadium site was available from January through March.

- (1) "LOD" is the limit of detection of the analytical method used.
- (2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.
- (3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.
- (4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.
- (5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. In calculating the mean, samples with concentrations less than the LOD were assumed to be equal to one half the LOD concentration.
- (6) Acrylonitrile data not available for full year and not reported.

3.2.1.3 Greenhouse Gases

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. Global warming occurs when the amount of heat trapped in the earth's

atmosphere is greater than the amount radiated. Global warming is a natural phenomenon, whereby the sun's heat trapped in the atmosphere maintains a habitable temperature and supports life. The heat is trapped and maintained by the presence of "greenhouse gases" or GHG. The GHG absorb longwave radiant energy reflected by the earth, warming the atmosphere. GHG also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG. Consequently, concern over the impacts of global warming relate not to the ability of the atmosphere to hold heat, but to the increase in emissions of GHG as the basis for irreversible change in the climate worldwide. Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, and more extreme heat days per year. One identified cause of global warming is an increase of GHG in the atmosphere. The six major GHG identified by the Kyoto Protocol are CO₂, methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), haloalkanes (HFCs), and perfluorocarbons (PFCs). In addition, black carbon particles entrained in the atmosphere are implicated in global warming.

Each greenhouse gas differs in its ability to absorb heat in the atmosphere. High global warming potential gases such as HFCs, PFCs, and SF₆ are the most heat-absorbent. Methane (CH₄) traps over 21 times more heat per molecule than carbon dioxide, and nitrous oxide absorbs 310 times more heat per molecule than carbon dioxide. Often, estimates of greenhouse gas emissions are presented in carbon dioxide equivalents (CO₂-eq), which weight each gas relative to the global warming potential of carbon dioxide, which has arbitrarily been assigned a value of 1 for comparison purposes. Table 3-4 shows the global warming potentials for different greenhouse gases for 100 year time horizon.

Table 3-4: Global Warming Potentials (GWPs) for Greenhouse Gases

Carbon dioxide, CO ₂	1
Methane, CH ₄	21
Nitrous oxide, N ₂ O	310
Hydrofluoro- and Perfluoro-carbons, HFC/CFC	6,500
Sulfur hexafluoride, SF ₆	23,900

As reported by the CEC, California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions (CEC, 2004) in spite of 10 percent of the country's population. The GHG inventory for California is presented in Table 3-8 (CARB, 2007). Approximately 80 percent of GHG in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (see Table 3-5).

In response to growing scientific and political concern regarding global climate change, California has recently adopted a series of laws to reduce both the level of GHG in the atmosphere and to reduce emissions of GHG from commercial and private activities within the state. In September 2002, Governor Gray Davis signed Assembly Bill (AB) 1493, requiring the development and adoption of regulations to achieve “the maximum feasible reduction of greenhouse gases” emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State. Setting emission standards on automobiles is normally the responsibility of the U.S. EPA. The Federal Clean Air Act, however, allows California to set a state-specific emission standard on automobiles if it first obtains a waiver from the U.S. EPA. On December 19, 2007 the U.S. EPA denied California’s request for a waiver. In response, California sued the U.S. EPA claiming that the denial was not based on the scientific data.

In June 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established GHG emissions reduction targets for the state, as well as a process to ensure that the targets are met. As a result of this executive order, the California Climate Action Team (CAT), led by the Secretary of the California State Environmental Protection Agency (CalEPA), was formed. The CAT published its report in March 2006, in which it laid out several recommendations and strategies for reducing GHG emissions and reaching the targets established in the executive order. The greenhouse gas targets are:

- By 2010, reduce to 2000 emission levels;
- By 2020, reduce to 1990 emission levels; and,
- By 2050, reduce to 80 percent below 1990 levels.

TABLE 3-5: California GHG Emissions and Sinks Summary
(Million metric tons, CO₂-equivalent)

Categories Included in the Inventory	1990	2004
ENERGY	386.41	420.91
Fuel Combustion Activities	381.16	416.29
Energy Industries	157.33	166.43
Manufacturing Industries & Construction	24.24	19.45
Transport	150.02	181.95
Other Sectors	48.19	46.29
Non-Specified	1.38	2.16
Fugitive Emissions from Fuels	5.25	4.62
Oil and Natural Gas	2.94	2.54
Other Emissions from Energy Production	2.31	2.07
INDUSTRIAL PROCESSES & PRODUCT USE	18.34	30.78
Mineral Industry	4.85	5.90
Chemical Industry	2.34	1.32
Non-Energy Products from Fuels & Solvent Use	2.29	1.37
Electronics Industry	0.59	0.88
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.97
Other Product Manufacture & Use Other	3.18	1.60
Other	5.05	5.74
AGRICULTURE, FORESTRY, & OTHER LAND USE	19.11	23.28
Livestock	11.67	13.92
Land	0.19	0.19
Aggregate Sources & Non-CO ₂ Emissions Sources on Land	7.26	9.17
WASTE	9.42	9.44
Solid Waste Disposal	6.26	5.62
Wastewater Treatment & Discharge	3.17	3.82
EMISSION SUMMARY		
Gross California Emissions	433.29	484.4
Sinks and Sequestrations	-6.69	-4.66
Net California Emissions	426.60	479.74

Source: CARB, 2007.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 will require CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG emissions by January 1, 2008;

- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and,
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

California Senate Bill 97 (SB97), passed in August 2007, is designed to work in conjunction with CEQA and AB32. SB97 requires the California Office of Planning and Research (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to, effects associated with transportation and energy consumption. These guidelines must be transmitted to the Resources Agency by July 1, 2009, to be certified and adopted by January 1, 2010. The OPR and the Resources Agency shall periodically update these guidelines to incorporate new information or criteria established by CARB pursuant to AB32. SB97 will apply to any EIR, negative declaration, mitigated negative declaration, or other document required by CEQA, prepared for a limited number of types of projects, which has not been finalized. SB 97 will be automatically repealed January 1, 2010.

The BAAQMD has also initiated a Climate Protection Program. On June 1, 2005 the Air District Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. A central element of the District's climate protection program is the integration of climate protection activities into existing District programs. The District is seeking ways to integrate climate protection into current District functions, including grant programs, CEQA commenting, regulations, inventory development, and outreach. In addition, the District's climate protection program emphasizes collaboration with ongoing climate protection efforts at the local and State level, public education and outreach and technical assistance to cities and counties.

The District has contracted two reports on potential mitigation of greenhouse gas emissions from Bay Area stationary sources. The reports were titled "Opportunities for Further Greenhouse Gas Emission Reductions for the BAAQMD Stationary Sources" and "Greenhouse Gas Mitigation: Landfill Gas and Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters." The first gave an overview of the potential areas for regulatory activity to reduce greenhouse gas emissions at Bay Area sources, and the second focused on two of the most promising categories, landfills and boilers.

The Climate Protection Grant Program is another aspect of the District's efforts to reduce greenhouse gas emissions. In 2007, the District awarded \$3 million to fund 53 local projects to reduce the Bay Area's carbon footprint. This \$3 million represents the largest single source of funding available for climate protection projects in the Bay Area. Grants were made to Bay Area local governments and non-profit organizations for implementation of innovative projects to reduce greenhouse gas emissions.

The District has developed a Source Inventory of Bay Area Greenhouse Gas Emissions, published in November, 2006. In it, GHG emissions from various sources are calculated for each applicable GHG, and CO₂-eq emissions are determined. The emissions focuses on direct GHG emissions due to human activities including commercial, transportation, domestic, forestry and agriculture activities in the San Francisco Bay region. This Source Inventory does not include indirect emissions, for example, electricity used by an industrial source or residence is not included, although emissions from Bay Area power plants are. Point sources, or sources of emissions that require BAAQMD permits are calculated directly from data submitted to BAAQMD by each facility, but area sources, which are groups of numerous small emission sources that do not require permits but collectively emit significant amounts of air pollutants, have been calculated based on estimated activities and emission factors for various categories. In addition, the emissions from mobile sources, such as cars, trucks, buses, boats, ships trains and aircraft have been calculated based on CARB's EMFAC2002 model or based on estimated fuel used and emissions factors.

The greenhouse gas with the greatest emissions is carbon dioxide (CO₂). Carbon dioxide emissions from various activities in the Bay Area represented 89.9 percent of total greenhouse gas emissions in 2002. Carbon dioxide emissions are mainly associated with combustion of carbon-bearing fossil fuels such as gasoline, diesel, and natural gas used in mobile sources and energy-generation-related activities. Other activities that produce CO₂ emissions include cement manufacturing, waste combustion, and waste and forest management. Methane (CH₄) emissions from various sources represent 4.5 percent of Bay Area's total CO₂-eq GHG emissions. Landfills, natural gas distribution systems, agricultural activities, fireplaces and wood stoves, stationary and mobile fuel combustion, and gas and oil production fields categories are the major sources of these emissions. Nitrous oxide (N₂O) emissions represent approximately 5 percent of the overall GHG inventory. Municipal wastewater treatment facilities, fuel combustion, and agricultural soil and manure management are the major contributors of nitrous oxide emissions in the Bay Area. Emissions from high global warming potential gases such as HFCs, PFCs and SF₆ make up approximately one half percent of the total CO₂-eq emissions. Industrial processes such as semiconductor manufacturing and electric power transmission and distribution systems are the major sources of HFCs, PFCs and SF₆ emissions in the Bay Area.

Direct GHG emissions by major source categories are shown in Table 3-6. Fossil fuel consumption in the transportation sector was the single largest source of Bay Area's GHG emissions in 2002. The transportation sector alone contributed 50.6 percent of GHG emissions in the Bay Area. Categories included in this sector are on-road motor vehicles, off-highway mobile sources, and aircraft.

Industrial and commercial sources (excluding petroleum refining and power plants, which are reported separately) were the second largest contributors of GHG emissions with 25.7 percent of total emissions. Industrial, commercial, and other sources include emissions from industrial processes such as waste management, cement manufacturing, fuel distribution, agriculture and forest management, and some other small sources.

Domestic sources, the third largest category, includes emissions from domestic combustion, but does not, as stated above, include impacts from electricity use. Domestic combustion includes emissions from residential furnaces, water heaters and cooking. Table 3-6 shows the relative and total contribution of major categories of emissions of GHG in the Bay Area. Based on population and emissions trends, the total amount of GHG emissions in the Bay Area has been estimated to be 95.8 million tons for 2008. Of this total, domestic combustion has been estimated to be 9.9 million tons, a slightly smaller percent of the total, at 10.3%.

Table 3-6: 2002 Greenhouse Gas Emissions by Major Category, BAAQMD

Major Category	Percent Contribution	CO2-eq (Million Tons/year)
Transportation	50.6%	43.2
Industrial/Commercial	25.7%	22.0
Power Plants	7.2%	6.1
Oil Refining	5.6%	4.8
Domestic	10.9%	9.3
Total	100%	85.4

3.2.1.4 Health Effects

Criteria Pollutants

Particulate Matter (PM10 & PM2.5): Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems. Exposure to particulate pollution is linked to increased frequency and severity of asthma attacks and even premature death in people with pre-existing cardiac or respiratory disease. Those most sensitive to particulate pollution include infants and children, the elderly, and persons with impaired heart and lung function and immunology systems. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Ambient PM is made up of particles that are emitted directly, such as soot and fugitive dust, as well as secondary particles that are formed in the atmosphere from reactions involving precursor pollutants such as oxides of nitrogen, sulfur oxides, volatile organic

compounds, and ammonia. Secondary PM and combustion soot tend to be fine particles (PM 2.5), whereas fugitive dust is mostly coarse particles. Directly-emitted particles come from a variety of sources such as cars, trucks, buses, industrial facilities, power plants, construction sites, tilled fields, unpaved roads, stone crushing, and burning of wood. Other particles are formed indirectly when gases from burning fuels react with sunlight and water vapor. These particles are an indirect product from fuel combustion in motor vehicles, at power plants, and in other industrial processes. Many combustion sources, such as motor vehicles and power plants, both emit PM directly and emit pollutants that form secondary PM.

In addition, particulate matter is responsible for a variety of other detrimental environmental effects, including visibility impairment, atmospheric deposition, aesthetic damages and public nuisances.

Ozone: Ozone (O₃), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are also sensitive to ozone, at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

Volatile Organic Compounds (VOCs): It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because VOC emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM₁₀ and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low

concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

Carbon Monoxide (CO): CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations, due to variations in the rate at which CO is emitted, and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable atmospheric portion of the day.

When CO is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

Nitrogen Dioxide (NO₂): NO₂ is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N₂) and oxygen (O₂) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO₂. NO₂ is responsible for the brownish tinge of polluted air. The two gases, NO and NO₂, are referred to collectively as NO_x. In the presence of sunlight, NO₂ reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO₃) which reacts further to form nitrates, which are a component of PM₁₀.

NO₂ is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

Sulfur Dioxide (SO₂): SO₂ is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H₂SO₄), which contributes to acid precipitation, and sulfates, which are a component of PM₁₀ and PM_{2.5}. Most of the SO₂ emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO₂ affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO₂ also causes plant damage, damage to materials, and acidification of lakes and streams.

Non-Criteria Pollutants

Toxic Air Contaminants: Chemicals are considered toxic if exposure to the compound causes adverse effects in a living organism. In order for the chemical to illicit an adverse effect, it must gain entry into the body through either inhalation (respiratory tract), ingestion (gastrointestinal tract), and dermal contact (skin). Most toxic substances do not cause harmful effects at the point of entry. Instead, entry into the body starts the physiological processes of the body to either absorb, distribute, store, transform, and eliminate the chemical. To produce a toxic effect, the chemical or its biotransformation product must reach a sensitive body organ at sufficient high concentration for an extended period of time.

The rates at which toxic compounds are absorbed, metabolized, and eliminated are very critical. If the body eliminates a toxic compound rapidly, it may tolerate an otherwise toxic dose when partitioned into fractional doses. If the body eliminates a toxic compound slowly, a low dose over a long period could result in accumulation of the toxic compound to a critical concentration. Exposure times may range from one day to a person's lifetime. In humans, the following criteria may be used to characterize exposure:

- Acute: 1 day
- Sub-acute: 10 days
- Sub-chronic: 2 weeks to 7 years
- Chronic: 7 years to lifetime

Once the toxic compound reaches the body organ, the toxic compound joins, or binds with a molecule or a group of molecules from a cell of a target organ, called an enzyme. The binding of the toxic compound interferes with the normal beneficial biochemical reactions of the human body or initiate abnormal metabolic reactions, resulting in adverse effect. The effects may be short term effects such as headaches or nausea. They can also be fatal.

The common way of classifying toxic effects from chemical exposure is through two broad categories: carcinogenic effects and non-carcinogenic effects. Carcinogenic compounds induce cancer while non-carcinogenic effects comprise all other effects. Carcinogenic compound can be further divided into genotoxic and non-genotoxic

compounds. Genotoxic carcinogens initiate and progress mutations necessary for the development of human cancer while non-genotoxic carcinogens speed up development of malignancy through immunosuppression. For non-carcinogenic compounds, human may exhibit developmental and reproduction effects from exposure to the compound such that actual impact is unknown until the latter stages of life.

Toxicity studies with laboratory animal or epidemiological studies of human populations provide the data used to develop toxicity criteria which determines the relationship between the exposure of the chemical compound to the nature and magnitude of the adverse health effects. For carcinogenic effects, numerical estimates of cancer potency, defined as cancer slope factor, determine the cancer risk due to constant lifetime exposure. Carcinogenic slope factors assume no threshold for effects such that exposure to any level of concentration is likely to produce a carcinogenic effect.

For non-carcinogens, reference dose is used as a health threshold. The reference dose is an estimate of a daily exposure to the human population including sensitive subgroups that is likely to be without an appreciable risk of deleterious effects during a lifetime of exposure.

Greenhouse Gases

Greenhouse gases do not have human health impacts like criteria or toxic pollutants. Rather, it is the increased accumulation of GHG in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the implications on human health. The effects of global warming due to an increase in GHG in the atmosphere may lead to higher maximum temperatures, more hot days and heat waves, resulting in an increase in deaths and serious illness among older age groups and urban poor, increased risk of disease epidemics, increased stress in livestock and wildlife and increased risk of crop damage; more intense precipitation events resulting in increased soil erosion, flooding, landslide, mudslide and avalanche danger; and increased summertime drying resulting in decreased water quality and quantity, increased risk of foundation damage due to ground shrinkage and increased forest fires among other potential direct and indirect impacts to human health.

3.2.1.5 Current Emission Sources

The two broad categories of emission sources include stationary and mobile sources.

Stationary Sources

Stationary sources can be further divided between point and area sources.

Point Sources: Point sources are those that are identified on an individual facility or source basis, such as refineries and manufacturing plants. BAAQMD maintains a computer data bank with detailed information on operations and emissions characteristics

for nearly 4,000 facilities, with roughly 20,000 different sources, throughout the Bay Area. Parameters that affect the quantities of emissions are updated regularly.

Area Sources: Area sources are stationary sources that are individually very small, but that collectively make a large contribution to the inventory. Many area sources do not require permits from the BAAQMD, such as residential heating, and the wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered to be area sources do require permits from the BAAQMD, such as gas stations and dry cleaners. Emissions estimates for area sources may be based on the BAAQMD data bank, calculated by CARB using statewide data, or calculated based on surrogate variables. Wood stoves are considered area sources.

Mobile Sources

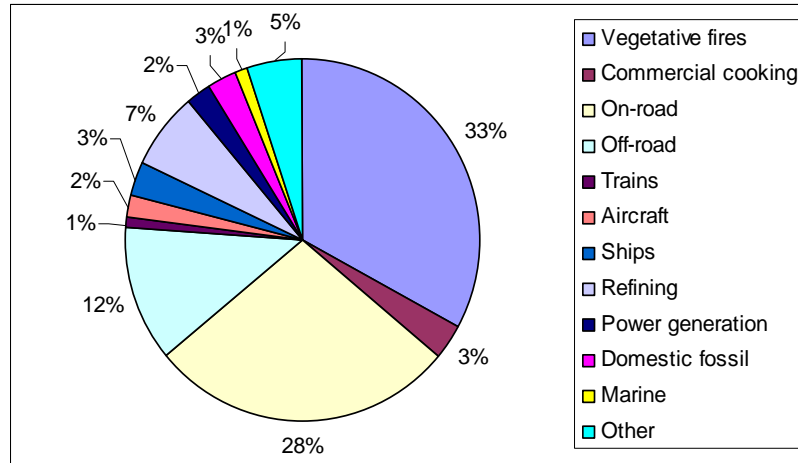
Mobile sources include on-road motor vehicles such as automobiles, trucks, and buses, as well as off-road sources such as construction equipment, boats, trains, and aircraft. Estimates of on-road motor vehicle emissions include consideration of the fleet mix (vehicle type, model year, and accumulated mileage), miles traveled, ambient temperatures, vehicle speeds, and vehicle emission factors, as developed from comprehensive CARB testing programs. The BAAQMD also receives vehicle registration data from the Department of Motor Vehicles. Some of these variables change from year to year, and the projections are based upon expected changes. Emissions from off-road mobile sources are calculated using various emission factors and methodologies provided by CARB and U.S. EPA.

3.2.1.6 Emissions From Wood Burning Devices

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33 percent) to PM_{2.5} in the Bay Area, as shown in Figure 3.1.

FIGURE 3-1: PM2.5 Concentration on Peak Days by Constituent in the Bay Area.



Note: Smoke from residential wood burning constitutes nearly all of the vegetative fires category during peak periods. The other major contributors, agricultural and wildland management burns, are prohibited under District Regulation 5 during “no-burn” days, when peak concentrations occur.

Other studies find results and trends that support emission inventory estimates derived from the BAAQMD data. The California Air Resources Board (CARB) found (Magliano, 1999) that residential wood combustion makes up 20 percent to 35 percent of wintertime particulate matter.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a particulate matter 10 microns and below in diameter (PM10) estimate for each county in the Bay Area. These data are summarized in Table 3-7 in tons per day (tpd) and tons per year (tpy), for both PM10 and PM2.5.

TABLE 3-7: Summary of PM Emissions from Wood-Burning Devices by County

County	Wood Stove PM ₁₀ (tpd)	Fireplace PM ₁₀ (tpd)	Wood Stove PM _{2.5} (tpd)	Fireplace PM _{2.5} (tpd)
Alameda	0.03	2.28	0.03	2.19
Contra Costa	0.76	4.32	0.73	4.15
Marin	1.03	0.37	0.99	0.36
Napa	0.33	0.41	0.32	0.39
San Francisco	0.03	0.28	0.03	0.27
San Mateo	0.38	0.70	0.36	0.67
Santa Clara	0.65	3.11	0.62	2.99
Solano	0.05	0.89	0.05	0.85
Sonoma	1.27	1.43	1.22	1.37
Total Emissions (tons per day)	4.54	13.80	4.36	13.25
Total Emissions (tons per year)	1657	5037	1591	4836

Because the category of PM10 also includes PM2.5, a large portion of PM10 particles are also PM2.5 particles. Therefore, the majority of particulate matter from wood smoke are fine particles which are of the greatest concern to public health.

Wood smoke emissions also has been found to contain numerous non-criteria pollutants, including toxic and carcinogenic air contaminants. These include formaldehyde and other aldehydes, chlorinated dioxins, and polyaromatic hydrocarbons (PAH). Among the PAH compounds present are pyrene, benzo(a)pyrene, benzo(e)pyrene, anthracene, fluoranthene, benzo(a)anthracene, benzofluoranthenes, and crysene.

Wood stoves emit greenhouse gases, including carbon dioxide and methane.

3.2.2 SIGNIFICANCE CRITERIA

3.2.2.1 Criteria Air Pollutants

The BAAQMD complies with the provisions of CEQA when they approve an individual project as lead agency or when they approve a regional project such as adoption of a rule or an air quality planning document. BAAQMD has established significance criteria, as discussed below. To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 3-8. If impacts equal or exceed any of the following criteria, they will be considered significant.

Criteria air pollutants have a regional impact, meaning that the emissions have the potential to degrade the air quality in the Bay Area as a whole. The thresholds for ROG and NOx are equivalent to the BAAQMD offset requirement threshold (15 tons per year)

for stationary sources (Regulation 2-2-302). The threshold for PM10 is based on the BAAQMD's definition of a major modification to a major facility (Regulation 2-2-221). The carbon monoxide threshold is based on the potential of a project to exceed the state ambient air quality standard for CO, 9.0 ppm averaged over eight hours, or 20 ppm averaged over one hour.

TABLE 3-8: Air Quality Significance Thresholds for Project Operations

Significance Thresholds for Regional Impacts	
Pollutant	Significance Threshold
ROG	15 tons/yr; 80 lbs/day; 36 kg/day
NO _x	15 tons/yr; 80 lbs/day; 36 kg/day
PM10	15 tons/yr; 80 lbs/day; 36 kg/day
CO	550 lbs/day

3.2.2.2 Non-Criteria Pollutants

Significance criteria for toxic air contaminants (TACs) are evaluated on a localized basis. The impacts of an increase in toxic air contaminants, unlike regional pollutants, may not be significant on a regional basis, but may be significant in their effect on populations located nearby the source. For this reason, significance criteria are based on the District's Risk Management Policy. Table 3.9 shows the significance thresholds for toxic air contaminants.

Table 3-9: Toxic Significance Thresholds for Project Operations

Significance Thresholds for Localized Impacts	
Pollutant	Significance Threshold
Toxic Air Contaminants (TACs)	Maximum Exposed Individual (MEI) Cancer Risk \geq 10 in 1 million Hazard Index \geq 1.0 at the MEI

3.2.2.3 Greenhouse Gases

The analysis of GHG is a much different analysis than the analysis of criteria pollutants. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health, e.g., one-hour and eight-hour. For non-criteria pollutants like toxic air contaminants, significance thresholds are based on risk to nearby receptors. The effects of GHG, however, are much longer term, affecting global climate over a relatively long time frame. In addition, GHG do not have health effects like criteria pollutants or toxic air contaminants. It is the increased accumulation of GHG in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project.

While direct GHG emissions can, in some cases, be calculated, the emissions cannot be precisely correlated with specific impacts based on currently available science. Climate change is a global phenomenon, making it difficult to develop the scientific tools and policy needed to select a CEQA significance threshold for climate change or GHG emissions on a regional or local level. As there are currently no emission significance thresholds to assess GHG emission effects on climate change, neither the BAAQMD nor any other California lead agency currently has a “significance threshold” to determine whether a new rule or project will have a significant impact on global warming or climate change. In the absence of regulatory guidance, and before the resolution of various legal challenges related to global climate change analysis and the selection of significance thresholds, a significance determination will be made on a case-by-case basis.

3.2.3 ENVIRONMENTAL IMPACTS

3.2.3.1 Criteria Air Pollutants

The overall objective of the proposed project is to reduce PM10 and PM2.5 emissions from wood burning devices. Rule 6-3 would reduce emissions of criteria pollutants by prohibiting wood-burning devices in new construction unless they were EPA Phase II certified equipment or pellet stoves, restricting the sale or transfer of new or used wood burning devices to EPA Phase II certified equipment or pellet stoves, prohibiting the use of wood-burning devices during curtailment periods, and restricting materials burned in wood burning appliances.

To estimate the amount of PM coming from wood-burning devices, including fireplaces, Air District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor for each device were then used to generate an estimate for PM10 and PM2.5 in the Bay Area.

The remaining operational criteria pollutants, VOC, NOx, SOx and CO were estimated to demonstrate that, in addition to particulate matter, Rule 6-3 would reduce VOC, NOx, SOx and CO emissions. Table 3-10 illustrates the results.

Table 3-10: Emission Reductions due to Curtailment, tons per year

	PM2.5	VOC	NOx	SOx	CO
Wood Smoke Emissions	810	1300	200	19	6200
Emissions from Natural gas usage	1	1	10	0.1	4
Net Emission Reductions	810	1300	190	19	6200

3.2.3.2 Non-Criteria Pollutants

The project, proposed Rule 6-3, will reduce the emissions of toxic air contaminants. The proposed rule allows sale, transfer or installation of only EPA Phase II certified devices, these combust the unburned products of wood smoke, which include many TACs, in a more efficient manner than non-certified devices. Wood stoves or wood-burning fireplaces would be banned in newly constructed housing. Natural gas is a cleaner burning fuel than wood; therefore the installation or replacement of pre-EPA approved devices with natural gas appliances would reduce toxic emissions and prevent an increase in wood smoke emissions from new developments. Finally, the rule would prohibit wood burning on nights when the amount of particulate matter in ambient air would exceed 35 micrograms per cubic meter. This would reduce exposure of individuals to TACs associated with wood smoke. Rule 6-3 is expected to provide beneficial impacts on toxic air contaminants and related beneficial health impacts.

3.2.3.3 Greenhouse Gases

In general, GHG do not have human health effects like criteria pollutants. Rather, it is the increased accumulation of GHG in the earth's atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project. Proposed Regulation 6, Rule 3 includes a provision that would prohibit burning on a night when the concentration of particulate matter in ambient air was predicted to exceed 35 $\mu\text{g}/\text{meter}^3$. To the extent that wood burning is used for heating, this could require the use of heat from other sources such as natural gas heaters on these curtailment nights. The NOP/IS suggested that the burning of fossil fuels such as natural gas rather than wood may increase greenhouse gas emissions. As explained below, there is some uncertainty about the GHG impacts of prohibiting wood burning on curtailment nights, but the most sophisticated life-cycle analyses of GHG emissions suggest that burning natural gas in relatively efficient furnaces produces lower GHG emissions than burning wood that has not been sustainably harvested.

Any analysis of GHG impacts must address a number of uncertainties and must rely on a variety of assumptions. For example, analysis of the use of wood as a fuel occasionally relies upon an assumption that wood burning is "carbon neutral," meaning that as trees are harvested for fuel, replacement trees sequester an equivalent amount of carbon dioxide so that, when measured over a period of time, there is no net increase in atmospheric carbon dioxide. However, more recent analyses of biofuels such as ethanol have suggested that the GHG emissions associated with their production and use may exceed GHG emissions from production and use of conventional fossil fuels when all

sources of GHG emissions – from land practices, to harvest, to transportation, to combustion – are included in the accounting.¹

The primary determining factor in the GHG analysis for Rule 6-3 is whether burning wood is “carbon neutral,” and, if not, whether burning wood in fireplaces and woodstoves produces lower GHG emissions than burning natural gas in furnaces. As a reference point, the District calculated a worst case scenario of the annual CO₂ increase from switching from wood to natural gas if wood burning is assumed to be completely carbon neutral. Assuming 100% compliance with the rule, and assuming that everyone who switches to natural gas on a “no burn” night would not otherwise use natural gas for heat, the result would be a 31,900 metric ton annual increase in CO₂. This figure would obviously be lower to the extent that there is less than 100% compliance or that a percentage of households were burning wood for ambiance and not for heat (the latter being a likely scenario for a large percentage of households).

Also for reference, the District compared this total carbon neutrality figure to the overall GHG inventory for the Bay Area and for the State. 31,900 metric tons is .03 % of the Bay Area total GHG inventory, and .007% of the total State GHG inventory. These percentages give some idea of the significance of a worst case GHG increase from 6-3 if carbon neutrality is assumed.

Although these figures may be useful reference points, available information indicates the carbon neutrality assumption is not valid for wood burning in the Bay Area. Since a switch from wood to natural gas on Rule 6-3 no-burn nights would increase GHG emissions only to the extent that either, (1) burning wood is carbon neutral (since burning natural gas is clearly not carbon neutral) or, (2) burning wood produces lower GHG emissions than burning natural gas, taking into account efficiency and other factors, and since neither is the case, it can safely be predicted that GHG emissions will not increase as a result of 6-3. In reaching this conclusion, the District reviewed available scientific literature and applied the most credible conclusions therein to information about the Bay Area obtained through published studies and data from a District-conducted survey.

In the winter of 2005 – 2006, a survey was conducted by a contractor to BAAQMD to estimate the amount and frequency of wood burning on winter nights in the Bay Area. The survey found that 4.5% of Bay Area households used (not just owned) wood stoves, and that 35.9% used fireplaces. Over the survey time period, conducted on days after cold winter evenings on which wood burning devices were used, the survey found that 45.3% of households that used wood stoves burned on the previous evening, and that 14.0% of fireplace users burned the previous evening. The survey also estimated a total number of logs burned, and found that, during the survey period, 319,115 logs were burned per day in fireplaces and 174,281 logs were burned per day in wood stoves.

¹ Fargione et al., “Land Clearing and the Biofuel Carbon Debt” *Science* 319, 1235 (2008); Searchinger et al., “Use of U.S. Croplands for Biofuels Increases Greenhouse Gas Emissions Through Emissions from Land Use Change” *Science* 319, 1238 (2008).

A limited number of studies address the GHG impacts of wood combustion. In general, earlier papers suggest that wood burning may be carbon neutral, while more recent papers qualify that assessment and either limit the CO₂ “credit” from sequestration by replacement trees or limit the circumstances under which wood combustion can be said to have GHG benefits over other fuels.

In a 1998 paper prepared for a U.S. EPA/Air and Waste Management Association conference, personnel from the Hearth Products Association, EPA, and OMNI-Test Laboratories, Inc., which tests appliances for the hearth products industry, summarized air quality impacts of various residential space heating options.² In reviewing GHG impacts, the authors state that “a reasonable estimate of the steady state condition produced by standard wood harvesting techniques is that 40% of the carbon produced by RWC is in the form of fixed carbon.” By this, the authors meant that calculated CO₂ emissions for RWC (residential wood combustion) should be reduced by 40%, because young trees replace harvested trees and sequester an amount of carbon equal to 40% of the carbon emitted from burning the harvested wood. For their 40% figure, the authors cite a 1990 paper in *Science*³ and a 1993 AWMA paper⁴. The 1990 *Science* paper concludes that conversion of old-growth forests to young fast-growing forests will not decrease atmospheric carbon dioxide because timber harvest reduces on-site carbon storage and does not approach old-growth storage capacity for at least 200 years. The 1993 AWMA paper states that wood burning for residential heating causes no net increase in atmospheric carbon dioxide if wood is sustainably harvested from properly-managed forests.

A much more sophisticated study prepared in 2003 for the Australian Greenhouse Office and Environment Australia concludes that burning wood for residential heating reduces GHG emissions relative to natural gas, but only under the scenarios examined in the study, which all involved sustainable firewood production systems. The three production systems were (1) collecting dead and fallen wood from remnant woodlands, (2) harvesting in a sustainably-managed native forest, and (3) harvesting in a new plantation planted on former agricultural land. No scenario involved production of wood through land clearing activities. Most importantly for present purposes, the study included a sensitivity analysis showing that, for wood collected from remnant woodlands, burning wood in an open fireplace has higher GHG emissions than burning natural gas. Specifically, the study concluded that burning wood from remnant woodlands in an open fireplace produces emissions of 0.70 kg CO₂/kW-hr, which is more than double the

² Houck, Crouch, Keithley, McCrillis, and Tieg; Air Emissions from Residential Heating: The Wood Heating Option Put Into Environmental Perspective; The Proceedings of a US EPA and Air and Waste Management Association Conference: Emission Inventory: Living in a Global Environment,; v1, 373-384; 1998.

³ M.E. Harmon, W.K. Ferrell, and J.E. Franklin, “Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests,” *Science* 247, 699 (1990).

⁴ J.F. Gulland, O.Q. Hendrickson, “Residential Wood Heating: the Forests, the Atmosphere, and the Public Consciousness” Paper 93-RP-136.02 presented at the 86th Annual Meeting of the Air and Waste Management Association (1993).

emissions from producing heat from natural gas, for which emissions are 0.31 kg CO₂ /kW-hr.

Based on dealer advertising, the primary firewood sold in the San Francisco Bay Area is oak. Oak is both the most prevalent source of firewood and also the most desirable, due to burn qualities. Bay Area dealers often advertise tree service companies as the primary source of the wood. Oak has been harvested in significant quantities from California's remnant woodlands beginning with the advent of ranching in California. Oak woodlands have been reduced by about half since the 1800's.⁵ From 1945 to 1973, most of the loss came from land clearing to support livestock production.⁶ Since 1973, woodland loss is attributable to urban growth, firewood harvesting, range clearing, and conversion to intensive agriculture.⁷ Between 1945 and 1985, oaks were cleared from 480,000 hectares in California.⁸ A more recent threat to the oak woodlands has been the conversion of native habitat to vineyards.⁹ This is occurring throughout Northern California on the periphery of the San Francisco Bay Area and in the foothills to the east of the Central Valley. In addition, the loss of oaks through Sudden Oak Death is primarily occurring in the San Francisco Bay Area, as fourteen counties are affected, including all nine Bay Area counties.¹⁰

Based on the Australian study discussed above and the available information about firewood used in the Bay Area, the imposition of no-burn requirements in the Bay Area is not expected to result in an increase in GHG emissions. Bay Area survey data shows that approximately two-thirds of the wood burned in the Bay Area is burned in fireplaces. According to the Australian study, GHG emissions from fireplace burning of wood gathered sustainably from remnant woodlands are more than double the GHG emissions from burning natural gas. Because oak firewood used in the San Francisco Bay Area comes largely from land clearing activities, GHG emissions from Bay Area wood burning would be expected to be even higher than those from the remnant woodland production system analyzed in the Australian study. This result should not be surprising because when a tree is harvested and not replaced, carbon dioxide is generated by burning the wood and, at the same time, an ongoing means of sequestering carbon is removed.

If no assumptions are made regarding carbon sequestration by trees, and wood and natural gas are compared purely on the basis of carbon dioxide produced per unit of heat

⁵ Standiford et al., "The Bioeconomics of Mediterranean Oak Woodlands: Issues in Conservation Policy" Paper presented at the XII World Forestry Congress, Québec City, Canada (2003).

⁶ Ibid.

⁷ Ibid.

⁸ C. Bolsinger, "The Hardwoods of California's Timberlands, Woodlands, and Savannas. U.S. Forest Service Resource Bulletin PNW-RB-148 (1988).

⁹ A.M. Merenlender, C.N. Brooks, G.A. Giusti "Policy Analysis Related to the Conversion of Native Habitat to Vineyard: Sonoma County's Vineyard Erosion and Sediment Control Ordinance as a Case Study" (2000) Available from the University of California Integrated Hardwood Range Management Program at http://danr.ucop.edu/ihrmp/policy_paper.pdf.

¹⁰ California Oak Mortality Task Force, Map: "Distribution of Sudden Oak Death as of February 14, 2008" (2008) Available from <http://www.suddenoakdeath.org/html/maps.html>.

energy delivered, burning natural gas on no-burn nights would produce lower GHG emissions than burning wood. Using the survey data, Table 3-11, below, compares the GHG emissions from wood-burning devices to the GHG emission that would be produced if the same amount of heat was produced by burning natural gas, as would be required on no burn nights. GHG emissions are reduced by a total of over 100,000 metric tons per year.

Table 3-11: GHG Emissions Direct Comparison, Wood Heat Replaced by Natural Gas Heat

Heat Value of Fuel, per curtailment day	GHG emissions; metric tons/yr
Wood; fireplaces, 2137.4 MM Btu useful heat	78,065
Wood; mfg. logs, 153.2 MM Btu useful heat	11,212
Wood, stoves, 8564.2 MM Btu useful heat	40,933
Wood; total, 3145 MM Btu useful heat input	130,210
Natural Gas; 3145 MM Btu useful heat input	29,419
Difference	(100,791)

Assumptions

- Efficiencies. This analysis uses a 10% heating efficiency factor for fireplaces, a 70% heating efficiency factor for wood stoves, and an 80% heating efficiency factor for a natural gas heater.
- Combustion efficiency. For these GHG emissions calculations, it is assumed that CO₂ emissions are the only GHG emissions from each type of combustion device.
- Number of no burn nights. Over the past five years, the average number of no burn nights was 17.1.
- Type of wood burned. The emissions estimates replace the Btu value of wood with natural gas combusted to get an equivalent Btu value. The Btu values used are based on the Btu value of red oak.

Even if one were to assume that emissions from wood burning should be reduced by 40% to account for carbon sequestration by trees, despite the lack of evidence to support such an assumption for the Bay Area, GHG emissions from burning wood would still be significantly higher than GHG emissions from burning natural gas to generate the same heat.

3.2.4 MITIGATION MEASURES

No significant adverse air quality impacts are anticipated from adoption of proposed Regulation 6, Rule 3: Wood-Burning Devices. No mitigation measures are required.

3.2.5 CUMULATIVE AIR QUALITY IMPACTS

The project, proposed Regulation 6, Rule 3: Wood-Burning Devices, does not have air quality impacts that are individually less than significant, but cumulatively significant. Adoption of the proposed rule will reduce emissions of particulate matter and other criteria air pollutants, toxic air contaminants and greenhouse gases.

3.2.6 CUMULATIVE MITIGATION MEASURES

No cumulatively significant adverse air quality impacts are anticipated from adoption of proposed Regulation 6, Rule 3: Wood-Burning Devices. No mitigation measures are required.

3.3 CONCLUSION

The project, proposed Regulation 6, Rule 3: Wood-Burning Devices, will have considerable environmental benefits. These include a reduction of peak concentrations of PM_{2.5}, as well as a reduction in ozone forming volatile organic compounds, oxides of nitrogen, carbon monoxide, sulfur dioxide, and non-criteria pollutants, including toxic and carcinogenic compounds. Based on this analysis, an increase in greenhouse gas emissions is not anticipated.

CHAPTER 4

ALTERNATIVES

Discussion

4.0 ALTERNATIVES

4.1 DISCUSSION

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR and the Initial Study (see Appendix A), the proposed new rule is not expected to result in significant impacts to any environmental resources including aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems. Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR. The requirement to develop alternatives under CEQA Guidelines §15126.6 has been satisfied because no significant adverse impacts were identified for the proposed project. No further discussion of alternatives is required for this EIR.

CHAPTER 5

OTHER CEQA TOPICS

Relationship Between Short-Term and Long-Term
Productivity
Significant Irreversible Environmental Changes
Growth-Inducing Impacts

5.0 OTHER CEQA TOPICS

5.1 RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM PRODUCTIVITY

An important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of these resources. Implementing Rule 6-3 is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the proposed rule is to reduce emissions of particulate matter and visible emissions, particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for fine particulate matter with a diameter less than 2.5 microns. The proposed rule is expected to control air pollution from wood-burning stoves, fireplaces, and heaters, including wood pellet stoves. By reducing particulate matter and visible emissions, human exposure to air pollutants would also be reduced, providing long-term health benefits.

Implementing Rule 6-3 would not narrow the range of beneficial uses of the environment. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. The beneficial air quality and health impacts associated with implementation of Rule 6-3 are expected to far outweigh any potential increase in CO₂ emissions. Existing programs are expected to provide long-term CO₂ emission decreases. Because no short-term environmental benefits are expected at the expense of long-term environmental goals being achieved, there is no justification for delaying the proposed action. The proposed project should be implemented now in order to meet the requirements of Senate Bill 656 (SB 656, Sher), adopted in 2003, as the District was required to develop a Particulate Matter Implementation Schedule in order to make progress toward attaining state and federal particulate matter standards. The District's wood burning program was identified in the District's Particulate Matter Implementation Schedule as one of the measures for enhancement and amendment. Rule 6-3 responds to that commitment. No short-term benefits at the expense of long-term impacts have been identified. In fact, the proposed project is expected to result in long-term emission reductions and long-term public health benefits.

5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA requires an EIR to discuss significant irreversible environmental changes which would result from a proposed action should it be implemented. Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting undeveloped land to urban uses), or enduring environmental damage due to an accident.

Implementation of the proposed rule is not expected to result in significant irreversible adverse environmental changes. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. Air quality impacts are expected to be less than significant as implementation of proposed rule will result in overall emission reductions of PM10 and PM2.5. The rules would also result in a decrease in other criteria pollutants, toxic air contaminants and greenhouse gases.

Proposed Rule 6-3 is expected to result in long-term benefits associated with improved air quality even though the use of natural gas in the Bay Area is expected to increase. The project would result in reduced emissions of all pollutants, thereby improving air quality and related public health.

5.3 GROWTH-INDUCING IMPACTS

A growth-inducing impact is defined as the “ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” Growth-inducing impacts can generally be characterized in three ways. In the first instance, a project is located in an isolated area and brings with it sufficient urban infrastructure to result in development pressure being placed on the intervening and surrounding land. This type of induced growth leads to conversion of adjacent acreage to higher intensity uses because the adjacent land becomes more conducive to development and, therefore, more valuable because of the availability of the extended infrastructure.

A second type of growth-inducing impact is produced when a large project, relative to the surrounding community or area, affects the surrounding community by facilitating and indirectly promoting further community growth. The additional growth is not necessarily adjacent to the site or of the same land use type as the project itself. A project of sufficient magnitude can initiate a growth cycle in the community that could alter a community’s size and character significantly.

A third and more subtle type of growth-inducing impact occurs when a new type of development is allowed in an area, which then subsequently establishes a precedent for additional development of a similar character (e.g., a new university is developed which leads to additional educational facilities, research facilities and companies, housing, commercial centers, etc.)

None of the above scenarios characterize the project in question. Rule 6-3 will control emissions from wood-burning devices and no new development would be required as part of the proposed new rule. The proposed project is part of the Particulate Matter Implementation Schedule developed by the District to comply with SB656 to accommodate making progress toward attainment of state and federal particulate matter standards. The proposed project would not change jurisdictional authority or responsibility concerning land use or property issues (Section 40716 of the California Health and Safety Code) and, therefore, is not considered to be growth-inducing.

CHAPTER 6

REFERENCES

6.0 REFERENCES

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6.2 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. A number of organizations, state and local agencies, and private industry have been consulted. The following organizations and persons have provided input into this document.

Organizations

California Air Resources Board
Bay Area Air Quality Management District
South Coast Air Quality Management District

List of Environmental Impact Report Preparers

Bay Area Air Quality Management District
San Francisco, California

Environmental Audit, Inc.
Placentia, California

CHAPTER 7

ACRONYMS

ACRONYMS

ABBREVIATION	DESCRIPTION
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
AB32	California's Global Warming Solutions Act of 2006
ATCM	Airborne Toxic Control Measure
ATHS	Air Toxics Hot Spots Program
BAAQMD	Bay Area Air Quality Management District
Btu/cord	British thermal units per cord
CalEPA	California State Environmental Protection Agency
CARB	California Air Resources Board
CAT	Climate Action Team
CEQA	California Environmental Quality Act
CH ₄	Methane
CHP	California Highway Patrol
CO	Carbon monoxide
CO ₂	Carbon dioxide
CPUC	California Public Utilities Commission
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EIR	Environmental Impact Report
EPS	Emissions Performance Standard
GHG	Greenhouse Gases
g/hr	grams per hour
H ₂ SO ₄	Sulfuric Acid
HFCs	Haloalkanes
HNO ₃	Nitric Acid
HWCL	Hazardous Waste Control Law
LPG	Liquefied petroleum gas
MACT	maximum achievable control technology
MEI	maximum exposed individual
MW-hr	Megawatt-hour
N ₂	Nitrogen
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFC	National Fire Codes
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NOP	Notice of Preparation
NOP/IS	Notice of Preparation/Initial Study
NO _x	Nitrogen Oxide
NSR	New Source Review

O ₂	Oxygen
O ₃	Ozone
OES	Office of Emergency Services
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM _{2.5}	particulate matter less than 2.5 microns equivalent aerodynamic diameter
PM ₁₀	particulate matter less than 10 microns equivalent aerodynamic diameter
ppb	parts per billion
pphm	parts per hundred million
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SB97	California Senate Bill 97
SB 656	Senate Bill 656
SCAQMD	South Coast Air Quality Management District
SF ₆	Sulfur Hexafluoride
SO ₂	sulfur dioxide
SO _x	sulfur oxide
STAT	Spare the Air Tonight
TACs	toxic air contaminants
TPD	Tons per Day
TPY	Tons per Year
U.S. EPA	United States Environmental Protection Agency
ug/m ³	micrograms per cubic meter
VOC	volatile organic compounds

APPENDIX A

**NOTICE OF PREPARATION AND INITIAL STUDY ON THE DRAFT
ENVIRONMENTAL IMPACT REPORT.**



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

California Environmental Quality Act

NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR ADOPTION OF DISTRICT REGULATION 6: PARTICULATE MATTER, RULE 3: WOOD-BURNING DEVICES

Interested Agencies, Organizations and Individuals:

Subject: Notice is hereby given that the Bay Area Air Quality Management District (Bay Area AQMD or District) will be the lead agency and will prepare an Environmental Impact Report (EIR) in connection with the project described in this notice. This Notice of Preparation is being prepared pursuant to California Public Resources Code § 21080.4 and CEQA Guidelines Section 15082.

Project Title: Bay Area AQMD proposed Regulation 6: Particulate Matter, Rule 3: Wood-Burning Devices.

Project Location: The rule will apply within the Bay Area AQMD, which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

Project Description: The District is proposing to adopt a new rule, Regulation 6: Particulate Matter, Rule 3: Wood-Burning Devices. The proposed rule will apply to residences and commercial establishments (hotels, restaurant, etc.) with wood-burning devices. The rule will limit visible emissions to 20% opacity, except for a start-up period; prohibit the burning of garbage, treated or unseasoned wood, plastics or other non-wood products; require labeling of the health hazards of breathing particulate matter on firewood and manufactured solid fuel products sold in the Bay Area and provide instructions on how to find information on the burn status of any day; require seasoned wood sold in the Bay Area to have a moisture content of 20% or less and require sellers to provide seasoning instructions if unseasoned wood is sold; prohibit the sale, transfer or installation of wood-burning devices unless they are EPA Phase II certified or wood pellet stoves; allow wood-burning devices only if they are EPA Phase II certified or pellet stoves in new construction; and prohibit burning under one of two options during days when the District predicts that the concentration of fine particulate matter (particulate matter less than 2.5 microns in diameter) in ambient air would exceed 35 micrograms per cubic meter. Under the first option, no burning in any wood-burning device would be allowed. Under the second option, burning would only be allowed in EPA Phase II certified wood-burning devices or pellet stoves.

In addition, the District is proposing to amend Regulation 5: Open Burning and Regulation 1: General Provisions and Definitions. The amendment to Regulation 5 would prohibit outdoor recreational fires when the concentration of fine particulate matter standard was predicted to exceed 35 micrograms per cubic meter. The amendment to Regulation 1 deletes an exclusion from District standards for residential heating, enabling adoption of the standards in proposed Regulation 6, Rule 3.

Probable Environmental Impacts: Adoption of a new rule to limit particulate matter emissions from wood-burning devices is intended to and expected to benefit public health and the environment. However, the District has chosen to prepare an EIR to ensure a comprehensive evaluation of any potential impacts. Attached to this notice is an Initial Study. The Initial Study outlines the areas of potential environmental impact that will be further reviewed in the draft Environmental Impact Report.

Response: This notice provides information on the above project and provides you an opportunity to submit comments on potential environmental effects that should be considered in the EIR. If the proposed project has no bearing on you or your agency, no action on your part is necessary. Due to the time limits mandated by State law, your response must be sent at the earliest possible date but **not later than 30 days** after receipt of this notice. If you or your agency wishes to submit comments, they may be sent to Eric Pop, via the contact information below.

Appendix A - Notice of Preparation and Initial Study

Eric Pop, Air Quality Specialist
Bay Area Air Quality Management District
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Email: epop@baaqmd.gov
Date: March 10, 2008

Chapter 1

Description of the Proposed Rule

Prior Control Efforts in the Bay Area

The Bay Area Air Quality Management District (District) is proposing adoption of Regulation 6, Rule 3 (Rule 6-3): Wood-Burning Devices. This proposed rule would control air pollution from wood-burning stoves, fireplaces, heaters, including wood pellet stoves. The District proposes adoption of Regulation 6, Rule 3 to reduce emissions of fine particulate matter (PM_{2.5}, or particulate matter with a diameter less than 2.5 microns), particularly on winter nights when fine particulate matter concentrations could exceed 35 µ/m³ (micrograms/cubic meter), which is the basis for the national health-based air quality standard. The national 24-hour standard for fine particulate matter in ambient air was lowered from 65 µ/m³ to 35 µ/m³ in December, 2006.

Currently, fireplaces and wood stoves used to heat residences are exempt from District rules by Regulation 1, Section 110.4. However, from time to time the District receives air pollution complaints about residential wood-burning devices, such as excessive smoke and odor. Because the District's regulations of general applicability, such as Regulation 6: *Particular Matter and Visible Emissions*, and Regulation 7: *Odorous Substances*, and the public nuisance standard in Regulation 1 do not apply, the District has been responding to such complaints with informational literature advising residents of the dangers of particulate matter and how to burn with a minimum of smoke.

The District also has a voluntary program to minimize particulate matter emissions from wood-burning devices, Spare the Air Tonight (STAT). The STAT program asks residents, via e-mail, the District website and press releases to radio and TV, not to burn on days when the concentration of PM_{2.5} in ambient air is predicted to exceed 35 µ/m³. The STAT season runs from mid-November through mid-February, and has been active since 1991. Typically, there are between 20 and 30 STAT nights. The 2007-2008 season was a-typical because there were only six. During the STAT season, the District conducts random telephone surveys to gauge the success of the voluntary program, the public's practices for burning to refine the emission inventory, and public attitudes and behaviors associated with wood burning.

In addition, the District has promoted a model ordinance to cities and counties that contains various elements that can reduce particulate matter from wood smoke. The model ordinance serves as a guidance document for cities and counties that wish to regulate sources of particulate matter in their communities. The model ordinance includes options for mandatory burning curtailments on STAT nights, for requiring that new or re-modeled homes contain only EPA Phase II certified devices, for prohibiting gas to wood heating conversion and for limiting fuel that can be burned. Enforcement of the model wood smoke ordinance typically occurs through the permit process at local

building departments. Residents must provide documentation that the device to be installed is allowed by the ordinance. To date, 41 Bay Area cities and eight counties have adopted aspects of this model ordinance, including a mix of voluntary and mandatory standards.

The District also co-sponsored and managed a financial incentive, or “wood stove change-out” program in Santa Clara County as part of an air quality mitigation program required by the California Energy Commission. Rebates were offered to residents to remove non-EPA-certified wood-burning devices, install only EPA-certified devices, or to retrofit wood-burning fireplaces with natural gas fireplaces. The District’s Cleaner Burning Technology Incentives Program offered a similar District-wide incentive program in 2007.

Harmful Effects of Wood Smoke

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33%) to PM_{2.5} in the Bay Area, as shown in Figure 2-1.

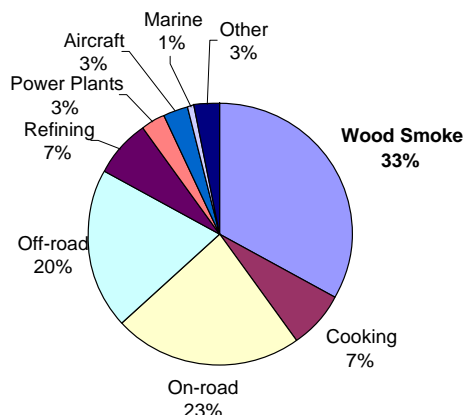


Figure 2-1. PM_{2.5} Concentration on Peak Days by Constituent in the Bay Area.

Other studies find results and trends that support emission inventory estimates derived from the District data. The California Air Resources Board found that residential wood combustion makes up 20 percent to 35 percent of wintertime PM.

To estimate the amount of PM coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of

Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a PM₁₀ estimate for each county in the Bay Area. These data are summarized in Table 2-1 in tons per day (tpd) and tons per year (tpy), for both PM₁₀ (particulate matter 10 microns and below in diameter) and PM_{2.5}.

County	Wood Stove PM ₁₀ (tpd)	Fireplace PM ₁₀ (tpd)	Wood Stove PM _{2.5} (tpd)	Fireplace PM _{2.5} (tpd)
Alameda	0.03	2.28	0.03	2.19
Contra Costa	0.76	4.32	0.73	4.15
Marin	1.03	0.37	0.99	0.36
Napa	0.33	0.41	0.32	0.39
San Francisco	0.03	0.28	0.03	0.27
San Mateo	0.38	0.70	0.36	0.67
Santa Clara	0.65	3.11	0.62	2.99
Solano	0.05	0.89	0.05	0.85
Sonoma	1.27	1.43	1.22	1.37
Total Emissions Bay Area (tpd)	4.54	13.80	4.36	13.25
Total Emissions Bay Area (tpy)	1657	5037	1591	4836

Table 2-1. Summary of PM emissions from wood-burning devices by county.

Because the category of PM₁₀ also includes PM_{2.5}, a large portion of PM₁₀ particles are also PM_{2.5} particles. Therefore, the majority of PM from wood smoke are fine particles. It is these fine particles that are of greatest concern to public health.

Objectives

The objective of Rule 6-3 is to reduce particulate matter and visible emissions from wood-burning devices and thereby reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations, with the goal of attaining the federal PM_{2.5} standard. The Bay Area is also not in attainment with the State particulate matter standards, so further reductions in emissions of PM are needed for that purpose as well.

The Bay Area attains the federal annual PM₁₀ (particulate matter of less than 10 microns in diameter) standard, but is not in attainment of the California annual PM₁₀ or PM_{2.5} or the California 24-hour PM₁₀ standard. The Bay Area is unclassified for the national 24-hour PM₁₀ and new 24-hour PM_{2.5} standard.

The BAAQMD is not required to produce an attainment plan for particulate matter. However, under the requirements of Senate Bill 656 (SB 656, Sher), adopted in 2003, the District was required to develop a Particulate Matter Implementation Schedule in order to make progress toward attaining state and federal PM standards. That plan was adopted in November, 2005. The District's wood burning program was identified in the District's PM Implementation Schedule as one of the measures for enhancement and amendment. Rule 6-3 responds to that commitment.

Proposed Rule

The District is proposing Regulation 6, Rule 3 to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the national PM_{2.5} standard.

Visible Emissions: Proposed Rule 6-3 would limit visible emissions from wood-burning devices, except 6 minutes during any hour period, to 20% visible emissions (equivalent to 1 on a Ringelmann Scale), except for 6 minutes during any hour. This opacity limit would not apply during a 20 minute start-up period for any wood fire. This opacity standard is required of other District operations from stationary sources, including dust from construction sites and any other regulated source. Failure to meet a visible emissions standard is indicative of poor ventilation to a fire, or poorly seasoned or wet wood. Based on District inspection staff observations, this standard is not difficult to meet for properly maintained and operated fireplaces and wood stoves.

Prohibit Burning of Garbage: Proposed Rule 6-3 would prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, glossy and/or colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device at any time. These materials produce volatile organic compounds, particulate matter and toxic compounds.

Labeling: Proposed Rule 6-3 would require a label be placed on firewood for sale, including manufactured wood products such as artificial logs and wood pellets. The label would address the health impacts from burning wood and how to find out when burning is prohibited. In addition, the label would have information on how to find out if burning is allowed on any given day. Unseasoned wood (moisture content of greater than 20%) would be required to be labeled as such and contain a notification that burning unseasoned wood is not allowed and provide instructions for seasoning.

Seasoned wood: Proposed Rule 6-3 would require that wood burned in a wood-burning device must be seasoned, meaning that it must have a moisture content of 20% or less. Only seasoned wood can be burned in a wood burning device. Unseasoned firewood may be sold, but must include a warning that it is not legal to burn before seasoning and instructions must be provided for seasoning.

Sale, transfer or installation: Federal law already requires newly manufactured wood stoves to meet EPA Phase II certification standards. Proposed Rule 6-3 would require that wood stoves sold, transferred or installed in the District meet these standards. Stoves sold as part of a house or other real estate transaction would not be affected by this prohibition.

New Construction: Proposed Rule 6-3 would allow only EPA certified wood-burning devices or pellet stoves in new construction. This would, among other things, prohibit conventional wood-burning fireplaces in new housing developments.

Burning Curtailment: Proposed Rule 6-3 would require one of two options that will limit the ability to burn on STAT nights, defined as a night when the ambient concentration of particulate matter is forecast to exceed $35 \mu\text{m}^3$. Option 1 would not allow any burning in a wood-burning device on STAT nights. Option 2 would allow burning in EPA Phase II certified stoves and pellet stoves on STAT nights, but not allow the use of other conventional fireplaces and non-EPA certified stoves. An exemption would be provided for either option if wood burning was the only source of heat for a home. This initial study evaluates both options.

Proposed Regulation 6, Rule 3 is intended to be considered by the Bay Area Air Quality Management District Board of Directors in conjunction with proposed amendments to District Regulation 1: General Provisions and Definitions and Regulation 5: Open Burning. The purpose of the amendments to the Regulation 1 is to remove an exclusion from District regulations for fires used for residential heating. The purpose of the amendment to Regulation 5 is to remove an exemption for outdoor recreational fires on proposed curtailment days. These amendments, however, do not create any potential environmental impacts beyond those discussed herein. This Regulation 6, Rule 3 analysis discusses the potential environmental impacts of the proposed rule with these adjunctive amendments.

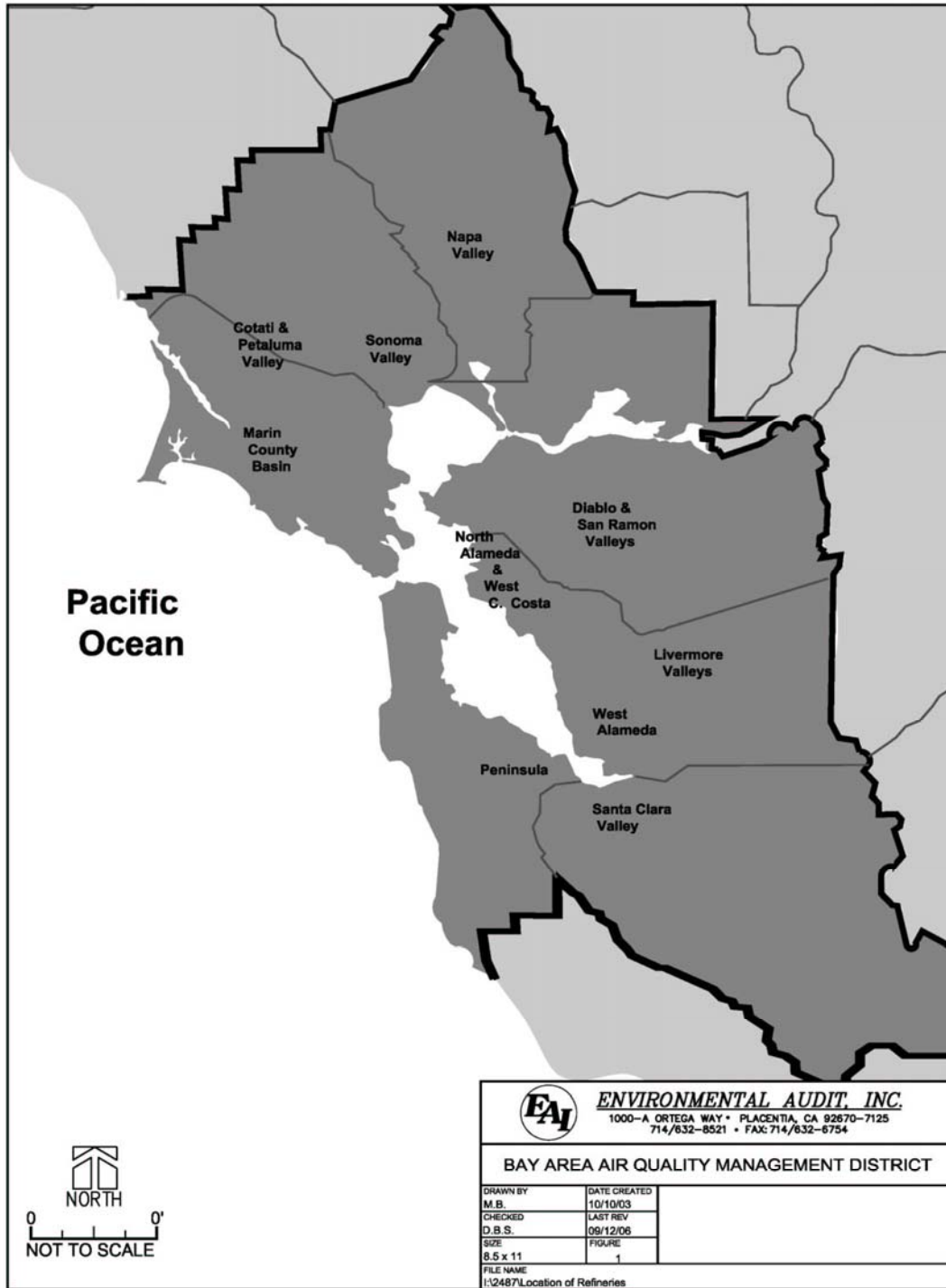
Affected Area

The proposed rule amendments would apply to residences and commercial businesses (hotels, restaurants, etc. with a fireplace or wood-burning device) within the BAAQMD jurisdiction. The BAAQMD jurisdiction includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma counties (approximately 5,600 square miles). The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys, and bays.

The facilities affected by the proposed rule amendments are located within the jurisdiction of the Bay Area Air Quality Management District (see Figure 1).

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Chapter 2 Environmental Checklist

ENVIRONMENTAL CHECKLIST FORM

- 1. **Project Title:** Bay Area Air Quality Management District (BAAQMD)
Proposed New Regulation 6, “Particulate Matter,” Rule
3, “Wood-Burning Devices”
- 2. **Lead Agency Name and Address:** Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109
- 3. **Contact Person and Phone Number:** Eric Pop, Compliance and Enforcement Division
415/749-5172 or epop@baaqmd.gov
- 4. **Project Location:** This rule applies to the area within the jurisdiction of the
BAAQMD, which encompasses all of Alameda, Contra
Costa, Marin, San Francisco, San Mateo, Santa Clara,
and Napa Counties and portions of southwestern Solano
and southern Sonoma Counties. The constituents
affected by the rule are located in the entire area under
Bay Area Air Quality Management District jurisdiction.
- 5. **Project Sponsor’s Name and Address:** (same as above)
- 6. **General Plan Designation:** N/A
- 7. **Zoning:** N/A
- 8. **Description of Project:** See “Background” in Chapter 1
- 9. **Surrounding Land Uses and Setting:** See “Affected Area” in Chapter 1
- 10. **Other Public Agencies Whose
Approval Is Required:** None

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Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a “Potentially Significant Impact”, “Less Than Significant With Mitigation Incorporated”, or “Less-than-Significant Impact”), as indicated by the checklist on the following pages.

- | | | |
|----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural Resources | <input checked="" type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | |

Determination:

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, so that an ENVIRONMENTAL IMPACT REPORT will be prepared.
- I find that the proposed project MAY have an impact on the environment that is “potentially significant” or “potentially significant unless mitigated” but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Signature

Date

Printed Name

For

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	
I. AESTHETICS.					
Would the project:					
a.	Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. In terms of physiography, the Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

Discussion of Impacts

a–d. Regulation 6, Rule 3 (Rule 6-3) is designed to limit emissions of particulate matter and visible emissions from wood-burning devices, through the requirement to use compliant wood-burning devices and prevent the use of non-compliant wood-burning devices during curtailment periods.

Rule 6-3 would restrict installation of wood-burning devices in new construction of buildings or structures to United States Environmental Protection Agency (U.S. EPA) Phase II certified wood-burning devices, pellet-fueled devices, or low mass fireplaces of a make and model that meets U.S. EPA low mass fireplace emission targets and has been approved in writing by the Air Pollution Control Officer (APCO) from the BAAQMD. In new developments, the installation of compliant wood-burning devices is expected to look essentially the same as non-

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compliance devices, so no change in the visual character of the environment is expected.

Rule 6-3 would establish criteria for the sale and installation of wood-burning devices. These requirements would control the type of indoor wood-burning devices that can be installed or used to replace existing devices. The Rule 6-3 compliant devices are similar in size and structure to the non-compliant devices, therefore this requirement is not expected to have an effect on the visual character of the environment. Proposed Rule 6-3 would reduce emissions of particulate matter, which can impact visibility, as well as air quality. A reduction in particulate matter emissions is expected to generate better visibility in the Bay Area.

Rule 6-3 would not require any new development, and compliant devices appear similar to non-compliant devices, therefore, obstruction of scenic resources or degrading the visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings, is not expected.

Rule 6-3 does not require any light generating equipment for compliance, so no additional light or glare would be created to affect day or nighttime views in the District.

Based on these considerations, significant adverse aesthetic impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant aesthetic impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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II. AGRICULTURAL RESOURCES.

In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:

- | | | | | | |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. | Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

As described under “Aesthetics,” land uses within the jurisdiction of the BAAQMD vary greatly and include agricultural lands. Some of these agricultural lands are under Williamson Act contracts.

Discussion of Impacts

- a–c. Rule 6-3 is designed to limit emissions of particulate matter and visible emissions from wood-burning devices. The proposed rule would not require conversion of existing agricultural land to other uses. The proposed rule is not expected to conflict with existing agriculture-related zoning designations or Williamson Act contracts. Williamson Act lands within the boundaries of the BAAQMD would not be affected. No effects on agricultural resources are expected because the proposed rule would not required any new development, but would require compliant wood-burning devices in new development areas. Therefore, there is no

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potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract.

Based on these considerations, significant adverse impacts to agricultural resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant agricultural were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	
III. AIR QUALITY.					
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a.	Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollution?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

The pollutants of greatest concern in the BAAQMD are various components of photochemical smog (ozone and other pollutants), particulate matter less than or equal to 10 microns in diameter (PM₁₀), and particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}). Ozone, a criteria pollutant, is formed from a

reaction of volatile organic compounds and oxides of nitrogen in the presence of ultraviolet light (sunlight). Particulate matter is made up of particles that are emitted directly, such as products of combustion and fugitive dust, as well as secondary particles that are formed in the atmosphere from reactions involving precursor pollutants such as oxides of nitrogen, sulfur oxides, volatile organic compounds, and ammonia. Secondary PM and combustion particles tend to be fine particles (PM_{2.5}), whereas fugitive dust is mostly coarse particles.

The Bay Area is classified as a non-attainment area for both the California and national ozone standards. The California standards are more stringent than the national standard. The Bay Area attains the national annual PM₁₀ standard, but is not in attainment of the California annual PM₁₀ or PM_{2.5} or the California 24-hour PM₁₀ standard. The Bay Area is unclassified for the national 24-hour PM₁₀ and 24-hour PM_{2.5} standard. There is no national annual PM₁₀ standard or California 24-hour PM_{2.5} standard. As with ozone, the California standards are more stringent. Particulate matter can cause serious health effects such as aggravated asthma, nose and throat irritation, bronchitis, lung damage, and premature death.

Discussion of Impacts

- a., c. Rule 6-3 is being proposed as part of an air quality control plan. In 2005 the BAAQMD published the “Particulate Matter Implementation Schedule”, pursuant to Senate Bill 656 (SB656), and wood smoke reduction was identified in that Schedule as a priority. Subsequently, the Air District Advisory Council examined wood smoke impacts on PM_{2.5} levels and issued recommendations to the Air District Board of Directors. The recommendations were accepted by the Air District Board of Directors and staff began work on a wood smoke reduction strategy. Rule 6-3 is one of many measures that, collectively, will reduce emissions of particulate matter and progress towards meeting the applicable federal and state air quality standards. The measures are not contingent on each other. Consequently, the rule is part of, and will not interfere with the implementation of an air quality plan.

The criteria pollutants are defined by the US EPA. They are ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxide. Rule 6-3 would limit emissions of particulate matter by requiring that new and replacement wood-burning devices meet EPA emissions criteria, restricting the installation of wood-burning devices that do not meet EPA emissions criteria in new construction, and by limiting the use of the existing devices under one of two options on certain nights as described in Chapter 1. None of these measures could result in the increase of any of the criteria pollutants.

- b., d. The primary purpose of Regulation 6, Rule 3 is to limit emissions of particulate matter and visible emissions from wood-burning devices as

part of an overall wood smoke reduction program within the jurisdiction of the BAAQMD. Wood smoke has been a concern in the District since scientific research began establishing a stronger connection between public health and emissions from wood smoke. Combustion processes, including the combustion of wood in wood-burning devices, are a major source of manmade air pollution, including particulate matter. Carbon monoxide, hydrocarbons, nitrogen oxides and toxic compounds are additional dangerous byproducts from the combustion of wood.

- e. Rule 6-3 will result in a decrease in particulate emissions from wood burning devices. Wood burning devices can generate smoke that has a distinctive odor. Affected devices are not expected to create objectionable odors affecting a substantial number of people because the installation of compliant wood burning devices are expected to result in more efficient combustion, reducing particulate matter emissions and the related odors. Further, Rule 6-3 would prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device. This requirement should also reduce odors.

- f. Even though the proposed rule is expected to result in a decrease in particulate matter emissions providing an air quality benefit, the proposed project may result in an increase in greenhouse gas emissions generating a potential impact on global climate change. This is because wood, a renewable resource, is considered “carbon neutral” whereas natural gas combusted to produce heat is not renewable and produces carbon dioxide, the primary contributor to global climate change. Therefore, there is the potential for cumulative greenhouse gas impacts which will be evaluated in a Draft EIR. Therefore, an EIR will be prepared to address air quality impacts associated with greenhouse gas emissions.

Based on these considerations, the cumulative increase in greenhouse emissions are potentially significant and will be further analyzed in a Draft EIR.

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		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES.					
	Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include

commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

- a-f Rule 6-3 is designed to limit emissions of particulate matter and visible emissions from wood-burning devices. The proposed rule would not require or bring about new residential or commercial development, but would restrict the installation of wood-burning devices in new development. Installation of new compliant devices is expected to be similar to installation of non-compliant devices. Therefore, installing compliant devices in new development or in existing structures is not expected to create additional impacts. Any new development that must comply with Rule 6-3 are constructed for business reasons other than to comply with Rule 6-3. Such projects may or may not have adverse impacts on biological resources. However, these projects would be built regardless of whether or not Rule 6-3 is in effect. As a result, the proposed rule would not directly or indirectly affect riparian habitat, federally protected wetlands, or migratory corridors.

The proposed rule would not conflict with local policies or ordinances protecting biological resources nor local, regional, or state conservation plans because it will only affect or restrict wood-burning devices in new development or prevent non-compliant wood-burning devices during curtailment periods. The proposed rule will also not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan.

Therefore, the proposed rule neither requires nor is likely to result in activities that would affect sensitive biological resources. Therefore, no significant adverse impacts on biological resources are expected.

Based on these considerations, significant adverse impacts to biological resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant impacts to biological impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
V. CULTURAL RESOURCES.				
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

Cultural resources are defined as buildings, sites, structures, or objects that might have historical, architectural, archaeological, cultural, or scientific importance. The State CEQA Guidelines define a significant cultural resource as a “resource listed or eligible for listing on the California Register of Historical Resources (CRHR)” (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the CRHR or in a local register or survey that meets the requirements of Public Resources Code Sections 5020.1(k) and 5024.1(g).

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

Discussion of Impacts

- a.-d. The proposed rule is not expected to have an effect on cultural resources because the proposed rule would not cause any new development. Rule 6-3 does not require any changes to existing fireplaces or other wood-burning devices. Therefore, Rule 6-3 is not expected to have significant impacts to historic buildings or require that wood-burning devices in historic buildings be removed or replaced.

The proposed rule would require that any new wood-burning devices installed be compliant with Rule 6-3. The removal and installation of non-compliant and compliant devices is not expected to require the use of heavy construction equipment, therefore, no impacts to historical resources are expected as a result of implementing Rule 6-3. No physical changes to the environment are expected to be required preventing disturbance to any paleontological or archaeological resources, nor would the rule require any physical changes that could disturb human remains. Any new residential or commercial operation that could have significant adverse affects on cultural resources would go through the same approval and construction process regardless of whether or not the proposed Rule 6-3 were in affect.

Based on these considerations, significant adverse impacts to cultural resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant impacts to cultural resources were identified, no mitigation measures are necessary or required.

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	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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VI. GEOLOGY AND SOILS.

Would the project:

- | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| <p>a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:</p> | | | | |
| <p>1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>2. Strong seismic groundshaking?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>3. Seismic-related ground failure, including liquefaction?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>4. Landslides?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>b. Result in substantial soil erosion or the loss of topsoil?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast

(approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone interfingering with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Strait and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along "active" faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Discussion of Impacts

- a.-e. No impacts on geology and soils are anticipated from the proposed rule that would apply to existing residential and commercial operations. The wood-burning devices to be regulated as part of this new rule will not create new development in the area. The proposed rule does not directly require structural alterations to existing structures.

Any new structures in the area must be designed to comply with the Uniform Building Code Zone 4 requirements since the Bay Area is located in a seismically active area. The local cities or counties are responsible for assuring that the proposed project complies with the

Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage.

The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

Any new residential or commercial operations will be required to obtain building permits, as applicable, for all new structures. New development or commercial operations must receive approval of all building plans and building permits to assure compliance with the latest Building Code prior to commencing construction activities. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the project will be required to comply with the Uniform Building Codes. No major construction activities are expected from the proposed rule. Therefore, no significant adverse impacts on geology and soils are expected.

Since Rule 6-3 would mostly affect new residential and commercial operations in the area, it is expected that the soil types present in the affected facilities and residences would not be further susceptible to expansive soils or liquefaction due to adoption of the proposed rule. Additionally, subsidence is not expected to occur because grading, or filling activities at affected facilities and residences despite adoption of the proposed rule that would only restrict the installation of wood-burning devices.

The proposed project has no affect on the installation of septic tanks or alternative wastewater disposal systems. Consequently, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

Based on these considerations, significant adverse geology and soil impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant geology and soils impacts were identified, no mitigation measures are necessary or required.

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		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS.					
	Would the project:				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h.	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Facilities and operations within the District handle and process substantial quantities of flammable materials and acutely toxic substances. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

Fires can expose the public or workers to heat. The heat decreases rapidly with distance from the flame and therefore poses a greater risk to workers at specific facilities where flammable materials and toxic substances are handled than to the public. Explosions can generate a shock wave, but the risks from explosion also decrease with distance. Airborne releases of hazardous materials may affect workers or the public, and the risks depend upon the location of the release, the hazards associated with the material, the winds at the time of the release, and the proximity of receptors.

For all facilities and operations handling flammable materials and toxic substances, risks to the public are reduced if there is a buffer zone between process units and residences or if prevailing winds blow away from residences. Thus, the risks posed by operations at a given facility or operation are unique and determined by a variety of factors.

Discussion of Impacts

- a., b. Since wood, pellet-fuel, and wood ash are not considered hazardous materials, use of compliant wood-burning devices would not require the routine transport, use, or disposal of hazardous materials. The restriction of compliant wood-burning devices in new development and commercial operations, or prohibition of non-compliant wood-burning devices during curtailment periods, would not create a significant hazard to the public or environment through a reasonable foreseeable upset and accident conditions involving hazardous materials. The use of electrical heaters as an alternative to wood-burning devices would not result in potentially significant adverse impacts because the use of hazardous materials would not be required.

While natural gas devices substituted for wood-burning devices could introduce greater explosive risk, the majority of residences and facilities in the District already have natural gas service. Natural gas is flammable, can be explosive under certain conditions, and a release of

natural gas may result in potentially significant hazards and risk of upset to people. The majority of facilities that would be affected by the proposed rule already have natural gas pipeline infrastructure for natural gas delivery. Natural gas burning devices must meet American National Standards Institute (ANSI) standards. Compliance with applicable federal, state and local regulatory requirements for the design and installation of natural gas devices would make the risk of accidental release less than significant. Further, Rule 6-3 includes an exemption from Rule 6-3 for wood-burning devices in areas where natural gas service is not available; therefore, Rule 6-3 will not require the installation of new natural gas utility lines or increase the hazards related to the use of natural gas.

- c. The proposed rule would not generate hazardous emissions, handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The use of compliant wood-burning devices in new development and during curtailment periods would not generate as many hazardous emissions as non-compliant wood-burning devices. Replacement of wood-burning devices with electric devices would reduce hazardous emissions or hazardous materials associated with wood burning.

Replacement of wood-burning devices with natural gas devices could increase risk of explosion. However, since natural gas devices would require building permits, compliance with federal, state, and local regulatory requirements for the design and installation of natural gas devices would limit the risk of accidental release to the degree that the risk would be expected to be less than significant regarding schools.

- d. The proposed rule would restrict the type of wood-burning devices at new residences and commercial operations. Government Code §65962.5 is related to hazardous material sites at industrial facilities. The proposed rule would affect residences and commercial facilities such as hotels, restaurants, lodges, etc., which are typically not associated with hazardous waste sites. Therefore, commercial facilities and residences would not normally be included on the list of hazardous material sites compiled pursuant to Government Code §65962.5. As a result, Rule 6-3 is not expected to affect any facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.
- e – f. The proposed rule would not result in a safety hazard for residents or workers within two miles of a public airport, a public use airport, or a private air strip. The use of compliant wood-burning, or alternative, devices in new development would not generate as many hazardous emissions as non-compliant wood-burning devices. Replacement of wood-burning devices with electric devices would reduce hazardous emissions or hazardous materials from wood burning.

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Replacement of wood-burning devices with natural gas devices could increase risk of explosion. However, since natural gas devices would require building permits, compliance with federal, state, and local regulatory requirements for the design and installation of natural gas devices would limit the risk of accidental release to the degree that the risk would be expected to be less than significant regarding public airports or private air strip.

- g. No impacts on emergency response plans are anticipated from the proposed rule. Wood-burning devices or their alternatives are not typically major components of any evacuation or emergency response plan. The proposed rule neither requires nor is likely to result in activities that would impact the emergency response plan. No major construction activities are expected from the proposed rule. Therefore, no significant adverse impacts on emergency response plans is expected.
- h. No increase in hazards related to wildfires is anticipated from the proposed rule that would apply to existing structures utilizing compliant wood-burning devices. The proposed rule will not create new residential or commercial land use projects. Any new development that might occur in the District would occur for reasons other than the proposed rule. New land use project would require a CEQA analysis that would evaluate wildfire risks. Mitigation measures would be required to reduce impacts to the maximum extent possible if the analysis determined such risks to be significant. Proposed Rule 6-3 is not expected to reduce the amount of brush cleared in wildfire hazard areas as the brush clearing is generally required for compliance with fire codes. The burning of brush in wood burning devices under proposed Rule 6-3 could still be accomplished, as long as the brush is seasoned and not burned on prohibited days. Most wood brush from private property that would be burned is seasoned before burning to produce a desirable (hot) fire. As Rule 6-3 would only provide minor and sporadic delays in burning, no significant impacts are expected.

Based on these considerations, significant adverse hazards and hazardous materials are not anticipated and will not be further analyzed in a Draft EIR. Since no significant hazard and hazardous materials impacts were identified, no mitigation measures are necessary or required.

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	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY.				
Would the project:				
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
j.	Contribute to inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and affected environment vary substantially throughout the area and include commercial, industrial, residential, agricultural, and open space uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the area under BAAQMD jurisdiction.

Discussion of Impacts

- a – j. Rule 6-3 would limit the installation of new, and replacement of existing wood-burning devices in the District to compliant wood-burning devices. Compliant wood-burning devices do not use water for any reason, nor do they generate wastewater. Any construction activities regarding replacement of non-compliant wood-burning devices would be minor and would not require heavy equipment, so there would be no soil disturbance attributed to the proposed rule.

No impacts on hydrology/water quality resources are anticipated from the proposed rule. Because compliant wood-burning devices do not use water for any reason, the proposed rule would not require construction of additional water resource facilities, create the need for new or expanded water entitlements, of necessitate alteration of drainage patterns. The residences and commercial operations affected by the proposed rule are required to comply with wastewater discharge regulations. The requirement to utilize compliant wood-burning devices will have no impact on wastewater discharges, alter drainage patterns, create additional water runoff, place any additional structures

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within 100-year flood zones or other areas subject to flooding, or contribute to inundation by seiche, tsunami or mudflow. No major construction activities are expected from the proposed rule and no new structures are required. Therefore, no significant adverse impacts on hydrology/water quality are expected.

Based on these considerations, significant adverse hydrology and water quality impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant hydrology and water quality impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IX. LAND USE AND PLANNING.				
Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

a-c. Rule 6-3 would not create any new development, but would restrict installation of wood-burning devices to compliant devices in new development and prohibit burning of non-compliant devices during curtailment periods. Thus, Rule 6-3 does not include any components that would mandate physically dividing an established community or generate additional development.

The proposed rule has no components which would affect land use plans, policies, or regulations. Regulating PM10 and PM2.5 emissions from wood-burning devices will not require local governments to alter land use and other planning considerations due to the proposed rule. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by Rule 6-3, and divisions of existing communities would not occur. Therefore, current or planned

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land uses with the District will not be significantly affected as a result of Rule 6-3.

Based on these considerations, significant adverse land use impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant land use impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
X. MINERAL RESOURCES.				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

a-b. The proposed rule is not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The proposed rule is not expected to create new development or result in construction outside any existing facility. Therefore, no significant impact to mineral resources is anticipated as a result of Rule 6-3.

Based on these considerations, significant adverse impacts to mineral resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant mineral resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XI. NOISE.				
Would the project:				
a.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?				
b.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Expose persons to or generate excessive groundborne vibration or groundborne noise levels?				
c.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				
d.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				
e.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?				
f.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?				

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

- a. Rule 6-3 would restrict installation of wood-burning devices in new development and prohibit use of non-compliant wood

burning devices during curtailment periods. Since no heavy-duty equipment is required to install compliant devices, noise impacts associated with the proposed rule are expected to be minimal. Operation of compliant wood-burning devices may require the addition of blowers or exhaust fans. Blowers and exhaust fans would be regulated by local building permits and are similar in some respects to those used in household water heaters. Noise from these systems, both indoors and outdoors, is expected to be limited to acceptable levels by the building permit process. Therefore, residences and commercial operations affected by the proposed rule are not expected to have a significant adverse affect on local noise control laws or ordinances.

- b. Rule 6-3 is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. Equipment used to install wood-burning devices in new or existing residences or commercial operations are not in any way expected to generate vibrations.
- c. Rule 6-3 is not expected to result in a substantial permanent increase in ambient noise levels in the District. The proposed rule would not create new development. Compliant equipment and non-compliant equipment operate at similar noise levels, and are designed to be operated in residences and commercial facilities (e.g., hotels, restaurants, etc.), where operators are protected by noise regulations, and residences will not tolerate excessive noise levels. Permanent increases in noise levels are not anticipated as a result of the proposed rule.
- d. Rule 6-3 is not expected to increase periodic or temporary ambient noise levels to levels existing prior to the proposed rule. The installation or replacement of wood-burning devices in new facilities would require minor construction activities and would not require the use of heavy equipment. Operational noise levels are expected to be equivalent to existing noise levels as discussed earlier.
- e., f. Implementation of Rule 6-3 would require only minor construction in existing facilities, and does not require the use of heavy equipment for installation in new or existing residences or commercial operations. No new noise impacts are expected from any existing facilities during construction or operation regardless of their proximity to a public/private airport. Thus, people residing or working in the vicinities of public/private airports are not expected to be exposed to excessive noise levels due to the proposed project.

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Based on these considerations, significant adverse noise impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XII. POPULATION AND HOUSING.				
Would the project:				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

Discussion of Impacts

- a–c. The proposed rule is not expected to result in the construction of new facilities or the displacement of housing or people. Implementation of the proposed rule will result require that new development install compliant wood-burning devices and restricts wood-burning devices during curtailment periods development. These modifications and restrictions would not induce growth or displace housing or people in any way. The proposed rule is not expected to result in significant adverse affects on population or housing.

Based on these considerations, significant adverse impacts on population and housing are not anticipated and will not be further analyzed in a Draft EIR. Since no significant population and housing impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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XIII. PUBLIC SERVICES.

Would the project:

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Given the large area covered by the BAAQMD, public services are provided by a wide range of entities. Fire protection and police protection/law enforcement services within the BAAQMD is provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

Discussion of Impacts

- a., b. The facilities affected by the proposed rule are not expected to require any new or additional public services. As shown in Section VII – Hazards and Hazardous Material of this Initial Study, the use of compliant wood burning appliances is not expected to generate significant explosion or fire hazard impacts so no increase in fire protection services is expected. Rule 6-3 is not expected to have any adverse effects on local police departments and require additional police services as it would only require the installation of compliant wood-burning devices for new development. Rule 6-3 would not require the development and these projects would be built regardless of whether or not Rule 6-3 is in effect. Therefore, no significant adverse fire and police protection impacts from the proposed rule are expected.
- c., d. As discussed in Section XII, Population and Housing, implementing Rule 6-3 would not induce population growth. Therefore, with no increase in local population anticipated, additional demand for new or expanded schools or parks is not anticipated. As a result, no significant adverse impacts are expected to local schools or parks.
- e. Besides building permits, there is no other need for government services. The proposal would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population as a result of implementing Rule 6-3, therefore, no need for physically altered government facilities.

Based on these considerations, significant adverse impacts on public services are not anticipated and will not be further analyzed in a Draft EIR. Since no significant public services impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIV. RECREATION.				
Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

- a-b. Rule 6-3 has no provisions affecting land use plans, policies, or regulations. The proposed project would not increase or redistribute population and, therefore, would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities. Therefore, implementation of Rule 6-3 is not expected to have any significant adverse impacts on recreation.

Based on these considerations, significant adverse impacts on recreation are not anticipated and will not be further analyzed in a Draft EIR. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC.				
Would the project:				
a. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Transportation infrastructure within the BAAQMD ranges from single-lane roadways to multilane interstate highways. Transportation systems between major hubs are located within and outside the BAAQMD, including railroads,

airports, waterways, and highways. Localized modes of travel include personal vehicles, busses, bicycles, and walking.

Discussion of Impacts

- a., b. Additional traffic or significant increases of staffing at existing residential or commercial facilities that would result in changes to traffic patterns or levels is not expected. The proposed rule would not involve any activities that would alter air traffic patterns; substantially increase hazards caused by design features; result in inadequate parking capacity; or conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.
- c. The proposed rule could result in minor modifications to existing residences and commercial operations as well as restrictions on the type of wood-burning devices to be installed in new development. The proposed rule is not expected to involve the delivery of materials via air so no increase in air traffic is expected.
- d., e. The proposed rule is not expected to increase traffic hazards or create incompatible uses. No affect on emergency access to affected residences or commercial facilities is expected from adopting the proposed rule. Utilizing compliant wood-burning devices versus non-compliant devices is not expected to have a significant adverse impact on traffic hazards, create incompatible uses or emergency access.
- f. No changes are expected to parking capacity at or in the vicinity of affected facilities as Rule 6-3 only pertains to wood-burning devices. No increase in permanent workers is expected. Therefore, the proposed rule is not expected to result in significant adverse impacts on parking.
- g. The proposed rule affects wood-burning devices and is not expected to conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks).

Based on these considerations, significant adverse transportation and traffic impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant transportation and traffic impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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XVI. UTILITIES AND SERVICE SYSTEMS.

Would the project:

a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Discussion of Impacts

- a-e. The proposed rule is restricted to both the installation of new, and replacement of existing wood-burning devices, with compliant devices. These regulations regarding wood-burning devices will not generate or affect wastewater, stormwater or stormwater drainage, and will not require water or affect water supplies. No increases in demand for public utilities are expected as a result of the proposed rule.

- f., g. Rule 6-3 would require the installation of compliant wood-burning devices and generally would not generate additional waste. Rule 6-3 could encourage the replacement of existing devices with newer compliant devices. As existing devices are replaced, their disposal is expected to be categorized as solid waste. Solid waste is either recycled or disposed of in landfills. Rule 6-3 is not expected to generate any significant increase in solid waste. Since any facilities would be replacing their non-compliant wood burning devices because of a remodel, not because of Rule 6-3, compliant wood burning devices installed during remodels and non-wood burning devices installed in new development are not expected to generate any more solid waste than non Rule 6-3 compliant devices. In fact, natural gas burning devices would not generate solid waste (e.g., wood ash). Therefore, no significant adverse impacts are expected to solid waste as a result of the proposed rule.

Based on these considerations, significant adverse utilities and service system impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant utilities and service system impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a. Rule 6-3 is not expected to create any new development. Because the rule will not require development, the proposed rule does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, no significant adverse impacts are expected as a result of the proposed rule.

- b. Even though the proposed rule is expected to result in a decrease in particulate matter emissions providing an air quality benefit, the proposed project may result in an increase in greenhouse gas emissions generating a potential impact on global climate

Appendix A - Notice of Preparation and Initial Study

change. Therefore, there is the potential for cumulative greenhouse gas impacts which will be evaluated in a Draft EIR. Rule 6-3 is not expected to generate any project-specific significant environmental impacts and is not expected to cause cumulative impacts in conjunction with any other environmental resources. Therefore, an EIR will be prepared to address air quality impacts associated with greenhouse gas emissions.

- c. Other than greenhouse gas impacts, Rule 6-3 is not expected to cause significant adverse effects on human beings. In fact Rule 6-3 is expected to reduce particulate matter emissions, reduce exposure to particulate matter, and reduce health impacts associated with exposure to particulate matter. Adoption of the rule is not expected to create significant adverse impacts on air quality. From the proceeding analyses, significant adverse impacts on aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, utility and service systems, and transportation and traffic are not an expected result from adoption of Rule 6-3.

APPENDIX B

RESPONSE TO COMMENTS RECEIVED ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

APPENDIX B

FINAL ENVIRONMENTAL IMPACT REPORT

BAY AREA AIR QUALITY MANAGEMENT DISTRICT REGULATION 6, RULE 3, WOOD-BURNING DEVICES

COMMENTS AND RESPONSES TO COMMENTS

INTRODUCTION

This Appendix, together with other portions of the Draft Environmental Impact Report (Draft EIR), constitute the Final EIR for the proposed BAAQMD Regulation 6, Rule 3, Wood-Burning Devices Project.

The Draft EIR was circulated for a 45-day public review and comment period on May 5, 2008 and ending June 18, 2008. The Draft EIR is available at the Bay Area Air Quality Management District (BAAQMD), 939 Ellis Street, San Francisco, California 94109, or by phone at (415) 749-5172. The Draft EIR can also be downloaded by contacting the BAAQMD's web pages at:

http://www.baaqmd.gov/pln/ruledev/regulatory_public_hearings.htm.

The Draft EIR contained a detailed project description, the environmental setting for each environmental resource where the NOP/IS determined there was a potential significant adverse impact, an analysis of the potentially significant environmental impacts including cumulative impacts, project alternatives, mitigation measures, and other areas of discussion as required by CEQA. The discussion of the project-related and cumulative environmental impacts included a detailed analysis of air quality and greenhouse gas emissions.

The BAAQMD received three comment letters on the Draft EIR during the public comment period. The comment letters and responses to the comments raised in those letters are provided in this appendix. The comments are bracketed and numbered. The related responses are identified with the corresponding number and are included following each comment letter.

From: Robert Poindexter [mailto:bob@epoindexter.com]
Sent: Thursday, May 22, 2008 11:46 AM
To: Eric Pop
Subject: Comments to the Draft EIR on proposed Regulation 6, Rule 3: Wood Burning Devices

Pursuant to The California Environmental Quality Act I am submitting these comments to BAAQMD in connection with the Draft Environmental Impact Report prepared for BAAQMD for purposes of its proposed Regulation 6, Rule 3. I ask that the District consider these comments and make them part of the Environmental Impact Report. Also, please advise me if there are any changes to the EIR or if the District takes any action with respect to the EIR. Finally, I would appreciate it if you would send me a response to this email to confirm that you have received my comments.

I believe the Draft Environmental Impact Report (EIR) prepared for BAAQMD for purposes of its proposed Regulation 6, Rule 3 contains some substantial errors in connection with its conclusion that greenhouse gas (GHG) emissions will not increase as a result of Rule 6-3.

The EIR relied heavily on a 2003 study by the Australian Greenhouse Office (<http://www.greenhouse.gov.au/nrm/publications/pubs/firewood.pdf>) that was designed to compare GHG emissions from wood burned for domestic heating to GHG emissions from domestic heating from nonrenewable sources such as natural gas. The Australian study looked at wood collected from three different sources, remnant woodlands, managed native forests and new wood plantations. The study considered the loss of carbon sequestered in the woodlands and forests as a result of the harvesting of firewood as well as the cost of transportation and processing. In each case the study found that the use of firewood for domestic heating resulted in less GHG emissions than nonrenewable heating sources. Overall the Australian study concluded “in terms of limiting net greenhouse gas emissions, firewood is generally more favorable for domestic heating than other non-renewable sources of energy.”

1-1

The EIR calculates that the proposed Rule 6-3 would cause fireplace users to resort to their gas furnaces and, with full compliance, result in as much as an additional 31,900 metric tons of CO₂, a greenhouse gas, being introduced into the atmosphere annually. Despite this finding the District concludes that its proposed fireplace restrictions would not result in any increase in greenhouse gas emissions. How did the EIR reach a conclusion so different from the Australian study upon which it relied so heavily? The EIR investigators made the assumption that all of the wood being used in fireplaces was being sourced by the elimination of woodlands and that the loss of those trees (and the CO₂ being sequestered in them) offset the benefit derived from heating with wood. The District does not cite any basis for its assumption that woodlands are being eliminated in order to provide fuel for fireplaces. The only investigation on this issue disclosed in the EIR is that researchers reviewed firewood dealer advertising. The EIR itself contradicts the District’s assumption stating that much of the loss of woodlands in the Bay Area is

1-2

1-3

APPENDIX B- RESPONSE TO COMMENTS

due to urban growth, conversion of land to vineyards and Sudden Oak Death, all activities that would occur regardless of fireplace use.

1-3
concluded

I conducted a survey of all firewood dealers listed in the June 2007 AT&T yellow pages for Marin County. A summary of the information provided from all such dealers who were willing to provide information follows:

Bear Bottom Farms, 508 De Carlo Ave., Richmond, CA, (415) 454-2917
Contact: Don Podesto, manager

They sell approximately 2,500 cords/year. Approximately 60% is almond, 30% walnut and 5% cherry and 5% other. The almond, walnut and cherry wood principally comes from farmers in the central valley who tear out old trees and replace them with younger trees in order to improve production. Approximately 90% is replanted. The farmer will typically pay to have the trees removed and cut into pieces and the wood is sold to firewood dealers. The farmer's removal costs are typically about equal to what is paid by firewood dealers. Sometimes the wood is just turned into chips in which case the farmer incurs a substantial net expense.

This dealer regularly gets calls from tree services offering oak and other wood for free but the offers are rejected because those woods are incompatible with the operation.

1-4

Marin Resource Recovery Center, 565 Jacoby St., San Rafael, CA, (415) 860-2601
Contact: Joe Garbarino, manager

They sell 300 to 350 cords/year. Approximately 60% pine, 15% eucalyptus, 15% bay, 10% oak. All wood is brought to them as refuse for disposal. He cuts and dries the wood before selling.

(Note: This firewood seller is not listed in the AT&T yellow pages. I included them because it is where I have sourced my firewood for the past few years.)

Valley Firewood, (415) 302-9797

Contact: Angel Loza, manager

They sell approximately 250 cords/year. Approximately 70% is almond, walnut, cherry and 30% is oak. The fruit and nut wood comes from farmers who are replacing old trees with younger trees or changing crops. The oak comes from agricultural land where the rancher is thinning pastureland. In both cases it is believed the farmer/rancher has the land cleared in exchange for the firewood or pays some net amount to have the land cleared.

Country Boy Firewood, (415) 279-2272

Contact: Louis, manager

This dealer is unwilling to disclose annual sales for competitive reasons. Approximately 30% oak, 20% eucalyptus, 20% madrone, 20% soft woods and 10% other. All of the wood is sourced from arborists and tree trimmers who want to dispose of the wood. He believes substantially all of the trees are removed because they present a hazard or they have already fallen. He does not pay for any of the wood unless it has been cut to size and split, in which case he will pay to cover the cost of that additional service.

1-4

Fessenden Firewood, Hoffman and 30th St., Richmond, CA, (510) 236-4789

Bruce Fessenden, manager

This dealer sells roughly 2,500 cords/year. Sales are approximately 50% nut tree wood and 50% Oak. The nut tree wood comes from the central valley and is the result of farmers replacing old trees with younger trees. He believes the farmers come close to break even on the tree removal. The Oak comes from large ranches in the Red Bluff – Redding area. The ranchers thin overgrown woodlands for agricultural reasons. Ranchers also receive approximately \$30 to \$35 per cord. There is no clear cutting that he is aware of. He believes California Dept. of Fish and Game oversees the tree cutting and requires a permit before cutting can take place.

None of the firewood dealers interviewed provided any support for the EIR assumption that for each cord of firewood being burned in the Bay Area there is an equivalent reduction in California’s remnant woodlands. In truth, the survey described above indicates that substantially all of the firewood being sold comes from trees that are being removed for economic and safety reasons that are unrelated to domestic wood burning and would occur in the absence of domestic wood burning. Only the oak coming from northern California results in any remuneration to the landholder and that appears to be a case of sustainably managed woodlands, similar to the situation found in the Australian greenhouse Office study. There is no evidence to support the assumption in the EIR that woodlands are being “reduced” to supply firewood for the Bay Area. The EIR improperly allocated the loss of the trees (and their sequestered CO₂) to households burning wood for heat. This resulted in a gross understatement of the GHG emissions that would result from the adoption of Rule 6-3. The GHG emission analysis in the EIR should be recalculated with only GHG emissions arising from the cutting and transportation of firewood being allocated to the firewood used for domestic heating.

1-4
concluded

A second error in the EIR results from the fact that the EIR assumes that there are only two types of wood burning appliances used for heating homes, wood stoves with an efficiency of 70% and fireplaces with an efficiency of 10%. The Australian Greenhouse Office study, upon which the EIR relies so heavily, indicates the efficiency of a fireplace can be significantly better if it is equipped with an insert. The Australian study used the following efficiencies of wood burning appliances: open fireplace 10%, open fire insert 30%, slow combustion insert 60%, non-air tight potbelly stoves 40% and slow combustion stoves 70%. The EIR erroneously assumes all fireplaces have an efficiency of only 10% and the erroneous assumption has the effect of understating the GHG emissions that would result from the adoption of Rule 6-3. The EIR should include a statistically relevant survey of the types of wood burning appliances being used by households so that the efficiencies of those appliances can be accurately calculated.

1-5

A third error in the EIR results from the fact that the EIR assumes that a household heating with a wood burning appliance would use the same number of Btu as that same household would use when it is heating with natural gas. While wood burning appliances are capable of heating only a limited space, natural gas furnaces are typically designed to heat the entire home. When a household that is relying on a wood burning appliance for heat is forced by Rule 6-3 to switch to a natural gas furnace that household may be required to heat the entire home and this would presumably require significantly more Btu of heat. While there are gas-heating appliances that are capable of heating a small space similar to a wood-burning appliance, the EIR unjustifiably assumes they are available to every household. The EIR offers no evidence to support that assumption. The assumption in the EIR that households will require the same Btu of useable heat whether heating with wood or natural gas results in an erroneously low calculation of the GHG emissions that will result from the adoption of Rule 6-3. The EIR should include a statistically relevant survey of households regarding the heating appliances that are

1-6

available and how wood burning and gas heating appliances are used so that the GHG emissions from the adoption of Rule 6-3 can be accurately calculated.

1-6
concluded

In conclusion, BAAQMD's effort to improve Bay Area air quality through proposed Rule 6-3 is a laudable objective. Whether Rule 6-3 will truly be in the public's best interest can be determined only if the adverse effects from the Rule are accurately assessed. Global warming as a result of GHG emissions is being recognized as an increasingly serious environmental threat that is expected to have an adverse effect on millions of people over multiple generations. Underestimating the extent to which Rule 6-3 will contribute to global warming is a disservice to the public and handicaps well intentioned policy makers. I urge BAAQMD to correct the errors in the draft EIR before proceeding with a final consideration of Rule 6-3.

Robert R. Poindexter
23 Stetson Avenue
Corte Madera, CA 94925
(415) 924-8376

COMMENT LETTER NO. 1
ROBERT POINDEXTER, CITIZEN
MAY 22, 2008

General Response

The draft EIR concludes that rule provisions prohibiting burning wood on days when air quality is unhealthy would not increase greenhouse gas emissions even though natural gas would have to be burned instead of wood on those days. The EIR reaches this conclusion because (1) the available evidence shows that a significant portion of the firewood burned in the San Francisco Bay Area comes from sources that are not “carbon neutral,” and therefore no different than burning natural gas in terms of greenhouse gas consequences, and (2) much of the wood is burned in inefficient fireplaces¹ that would require large quantities of wood to produce the same heat produced by the relatively efficient burning of natural gas in a gas furnace.

The commenter argues that there would be an increase in GHG emissions because much of the wood comes from activities that would occur regardless of fireplace use, such as thinning of ranch land, tree trimming and removal by arborists, and loss of trees to sudden oak death. But this argument appears to involve a misunderstanding of “carbon neutrality” as it applies to the carbon cycle for trees. Burning wood can be said to be “carbon neutral” when the carbon dioxide released by burning wood is balanced by carbon dioxide removed from the atmosphere through photosynthesis in replacement trees. Only if a harvested tree is replaced by a new tree is there any carbon “credit.” Without this credit, burning firewood increases GHG emissions both when the firewood is harvested (by removing a carbon sequestration mechanism) and when it is burned (by releasing carbon bound up in the wood). Under these circumstances, firewood becomes just another carbon-releasing fuel, except that it typically has lower heating efficiency than other fuels.

Instead of assuming “carbon neutrality” based on tree replacement, the commenter may be assuming that when wood comes from a waste stream that would otherwise go to a landfill, using the wood as a fuel reduces GHG emissions because it replaces natural gas that would otherwise be required. If the commenter is making this waste-stream-diversion argument, the argument relies on a further assumption that burning the wood releases carbon that would otherwise be released in the landfill, and it ignores the significant efficiency difference between burning wood and burning natural gas. However, U.S.D.A. Forest Service scientists have shown that wood deposited in a landfill will remain indefinitely with almost no decay and no release of carbon.² In addition, it takes a great deal of wood to generate the same heat as is generated by a small amount of natural gas, given the widespread use of inefficient fireplaces in the Bay Area. As a

¹ Of the 1.2 million wood burning appliances in the Bay Area, 1.1 million are fireplaces.

² J.A. Micales and K.E. Skog, “The Decomposition of Forest Products in Landfills,” *International Biodeterioration and Biodegradation*, 39(2-3):145-158 (1997).

result, there is no basis for the argument that burning wood diverted from landfills instead of burning natural gas will reduce GHG emissions.

Because there are no simple answers in this area, the EIR relied in part on an Australian study in which scientists sought to model the complex carbon flows in three firewood production systems used in Australia.

Response 1-1

The commenter notes the EIR’s citation of the Australian study and quotes its conclusion that “in terms of limiting GHG emissions, the use of firewood for domestic heating is generally more favorable than the use of other non-renewable sources of energy.” However, the commenter fails to note that this conclusion applies to the specific scenarios analyzed and is not a general conclusion that burning firewood is always better than burning natural gas. The point made in the EIR (see pages 3-30 and 3-31) was that the sensitivity analysis in the Australian study showed that when dead and fallen wood is harvested from remnant woodland, and the wood is burned in open fireplaces, GHG emissions are higher than they are for burning natural gas, even though this wood harvesting is carried out in a sustainable manner. The authors of the Australian study specifically note this aspect of their study:

“Although our results do indicate that using firewood from woodlands was better than most other forms of domestic heating in terms of limiting emission of greenhouse gases, one must be careful when evaluating firewood use from woodlands. This is due to our sensitivity analysis indicating that emission of greenhouse gases would actually be equal to or higher than alternative forms of heating if growth rates were only 70% of our assumptions, and if tree mortality was slightly higher at 1.2% per year, or if the firewood was burnt in an open fireplace rather than in an open fire insert or another type of wood heater.”

Response 1-2

Contrary to the commenter’s assertions, the EIR does not state that the rule would result in as much as 31,900 metric tons of CO₂ annually. Instead, the EIR states that, if burning wood is assumed to be “carbon neutral,” the increase would be of this magnitude. The EIR (see page 3-31) explains how available evidence shows this to be an invalid assumption and how more appropriate assumptions yield a conclusion that the rule would not increase GHG emissions.

Response 1-3

The commenter asserts that the EIR’s conclusion that the rule would not increase GHG emissions is based on the assumption “that all of the wood being used in fireplaces was being sourced by the elimination of woodlands....” and that no basis was cited for the assumption “that woodlands are being eliminated to provide fuel for fireplaces.” First,

this comment appears to reflect the misunderstanding discussed in the General Response above. In determining whether a carbon “credit” applies, it is appropriate to look to whether a harvested tree is replaced by a new tree, and it is irrelevant why the tree was cut down. If oak is being used as firewood in the context of a general decline in oak woodland acreage, one can reasonably assume that a carbon “credit” is unwarranted. The dealer advertising reviewed by the Air District and the dealer survey performed by the commenter document the use of oak³, and the studies cited in the EIR document the decline in oak acreage.

Second, the EIR’s conclusion does not rely on an assumption that all wood burned is coming from the elimination of woodlands, and is therefore not carbon neutral. To the contrary, the EIR notes that even if a 40 percent credit is allowed (i.e., assume a reduction in GHG emissions of 40 percent for carbon sequestration by replacement trees), the use of natural gas would reduce GHG emissions, largely because of the significant difference in efficiency between fireplaces and natural gas furnaces. Based on the calculations in Table 3-11 in the EIR, GHG emissions would be higher for wood even if wood is given a GHG credit of 75 percent.

Response 1-4

The commenter states that his survey of firewood dealers does not support “the EIR assumption that for each cord of firewood being burned in the Bay Area there is an equivalent reduction in California remnant woodlands.” First, as noted in Response 1-3, the EIR does not rely on such an assumption. Instead, the EIR assumes that burning wood is not necessarily carbon neutral and concludes that even if a significant GHG credit is allowed for some portion of the wood supply, GHG emissions are higher for burning wood given the relative inefficiency of wood combustion. The comment appears to reflect the commenter’s assumption that carbon credits accrue because of the wood’s status as “waste” (i.e., it was harvested for reasons other than to supply firewood) and that burning waste wood therefore produces lower GHG emissions than burning natural gas. But, as discussed in the General Response, carbon credits result from the replacement of harvested trees by new trees, and studies show that burning waste wood has much higher GHG impacts than placing it in a landfill.

The commenter’s survey does support an assumption that some carbon credit is appropriate for some sources of wood. For example, if it is true that most wood from nut trees comes from replacement of old trees by new trees, as two survey responses suggest, then burning such wood may be carbon neutral. However, the survey does not support the commenter’s claim that oak involves “sustainably managed woodlands, similar to the situation found in the Australian Greenhouse Office study” in light of the evidence cited in the draft EIR. The Australian study assumes sustainably harvested remnant woodlands, which would mean that there is no reduction in acreage. Even though the

³ In addition, a consultant to the Air District conducted random surveys of Bay Area residents in 2005, 2006, and 2007 regarding wood burning practices. Of those respondents burning natural wood logs, 70% burned oak, while 8% burned almond or fruitwood.

individual examples from the commenter’s survey may involve thinning of oak woodland without a reduction in acreage, the studies cited by the EIR document an overall decline in California oak woodland acreage. The survey data therefore do not alter the conclusion of the EIR that, even if a significant carbon credit is allowed for wood, GHG emissions from burning wood are higher than from burning natural gas.

Response 1-5

The commenter claims that it is an “error” for the draft EIR to assume heating efficiencies of 10 percent for fireplaces and 70 percent for wood stoves. This comment is presumably directed at the Table 3-11 calculation of GHG emissions from burning wood and natural gas. The table includes footnotes explaining that, for purposes of the calculations in the table, wood stove heating efficiency is assumed to be 70 percent and fireplace heating efficiency is assumed to be 10 percent. Because the Australian GHG study used models that allowed use of a variety of efficiency assumptions for fireplaces and for wood stoves, the commenter asserts that reliance on a single figure for fireplaces “has the effect of understating the GHG emissions that would result from the adoption of Rule 6-3.”

The comment provides no basis for doubting the general validity of the assumptions and calculations in the EIR. First, while it is true that fireplace efficiency may be increased by use of a fireplace insert (thereby reducing GHG emissions), the assumed efficiency of 10 percent is almost double the efficiency of 5.8 percent actually measured by Lawrence Berkeley Laboratory in a study that looked at the net heating efficiency of an open fireplace in Walnut Creek, California.⁴ It is therefore doubtful that the efficiency assumption for fireplaces overstates GHG emissions for fireplace burning, even assuming some use of fireplace inserts. Second, the EIR assumes an efficiency of 70 percent for all wood stoves despite the lower efficiency of 40 percent noted in the Australian study for some stoves. Conventional U.S. wood stoves have an average efficiency of 54 percent while EPA-certified wood stoves have an average efficiency of 68 percent.⁵ Use of the 70 percent figure for woodstoves therefore understates wood stove GHG emissions by overstating their efficiency. As a result, even if fireplace GHG emissions are lower than the calculations show, which the commenter has not demonstrated, wood stove GHG emissions are higher than the calculations show. The calculations in the EIR therefore rely on balanced assumptions in calculating GHG emissions from burning wood in fireplaces and wood stoves, while the commenter would have the EIR make only those assumptions that favor his argument.

⁴ M.P. Modera and R.C. Sonderegger, “Determination of In-Situ Performance of Fireplaces,” University of California, Lawrence Berkeley Laboratory, report number LBL-10701, prepared for the U.S. Department of Energy (1980).

⁵ United States Environmental Protection Agency, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary, Point and Area Sources, Chapter 1, Section 1.10, “Residential Wood Stoves” (1996).

Response 1-6

The commenter asserts that in calculating the GHG impacts of prohibiting wood burning on days with unhealthy air quality, it is an “error” to assume that a home would require the same quantity of heat, regardless whether it comes from burning wood or from burning natural gas. The commenter states that wood-burning appliances are capable of heating only a small portion of a house while gas furnaces are typically designed to heat an entire home. The commenter then argues that “[w]hen a household that is relying on a wood-burning appliance for heat is forced by Rule 6-3 to switch to a natural gas furnace that household may be required to heat the entire home and this would presumably require significantly more Btu of heat.” Implicit in this argument is an assumption that those who burn for heat typically turn the gas furnace off and use only a room heated by the fireplace or wood stove. The commenter suggests that the EIR should include a survey regarding how wood burning appliances are used.

The use of behavioral assumptions, such as the one advocated by the commenter, is unlikely to alter the conclusions of the EIR. The assumption proposed by the commenter would apply only to those households that burn wood for heat⁶. Assumptions would also have to be made about those households that burn wood for “ambience” rather than for heat. The Air District conducted surveys in 2005, 2006, and 2007, and the data show that roughly half of Bay Area residents burning wood do so for ambience. For these residents, it is reasonable to assume that the home’s furnace continues to operate during wood burning. As a result, the heat from roughly half of the wood burned would not be replaced by GHG emissions from burning gas, since that gas is already being burned, and not as a consequence of the rule. Relying on this assumption, the EIR would assign no GHG emissions to half of the wood burned for ambience and roughly 15,000 metric tons per year for wood burned for heat (half the amount shown in Table 3-11). The EIR assumption that, in response to the rule, a gas furnace is turned on to replace wood heat in every case is therefore conservative and roughly doubles what the natural gas GHG emissions would be if “ambience” burning is addressed by an appropriate behavioral assumption.

If the commenter’s behavioral assumption is also used (i.e., “entire home” heat quantities from natural gas replace “small space” heat quantities from wood), the GHG emissions from burning natural gas to replace that half of the wood burned for heat would be greater than assumed in the EIR. However, the increase would be unlikely to alter the EIR conclusion that the rule would not lead to an increase in GHG emissions. Emissions would have to go from 15,000 metric tons (assigning zero natural gas GHG emissions for “ambience” burning) to more than the roughly 130,000 metric tons of GHG emissions shown in Table 3-11 for all wood burning. This increase is nearly an order of magnitude and highly unlikely.

⁶ Note that a very small percentage of Bay Area homes, approximately 1 percent based on 2000 census data, rely primarily on wood for heat. The comment appears to relate to those homes that may burn wood occasionally or regularly in an attempt to reduce the use of natural gas or to reduce energy costs.

The behavioral assumptions are speculative. In particular, the comment offers no evidence to support an assumption that those who burn for heat retreat to one room and turn off the furnace that heats the rest of the home. Though this may be the practice in some households, it may not be common enough as a regular practice to warrant an assumption that applies broadly, particularly given the relatively mild climate of the Bay Area. In any case, if behavioral assumptions are employed, they are unlikely to alter the conclusion of the EIR that curtailing wood burning would not increase GHG emissions.

28 May 2008

Note To: Eric Pop, Air Quality Specialist, BAAQMD

Comments on the Draft Environmental Impact Report (DEIR) on proposed District Regulation 6, Rule 3: Wood-Burning Devices.

Prepared by P. Michael Dubinsky, 695 Posada Way, Fremont, CA 94536

I have reviewed the DEIR on the proposed District Regulation 6, Rule 3: Wood Burning Devices. I do not agree with the provision of the proposed rule which would prohibit the use of EPA Certified equipment (wood stoves) on days which are determined to be Save The Night Time (STAT). My comments on the DEIR which underpin, in part, my views on this unnecessary provision to the proposed rule follow:

Pages 3-17 & 3-18 – Section 3.1.2.4. Describes the sources of Ambient Particulate Matter (PM) for the 9 county Bay area that are included in the BAAQMD's jurisdiction. One source that is not mentioned is PM from foreign sources such as China. I have attached internet links to reports indicating that there is scientific viewpoint and documented evidence that PM travels via air-currents from Asian Countries such as China and impacts the West Coast of the USA.

2-1

The presence of PM from this additional source should be factored into the overall evaluation for impact and relevance. That does not appear to have been done. If PM from non-USA sources represents a significant contributor to the ambient PM then the solution to the concern about ambient PM adversely impacting Bay area air quality may not be found in the proposed rule. In addition my review of the *Technical Report dated April 2008, Sources of Fine Particles* listed among the reference materials for the DEIR cites data from 1999-2001 which makes it outdated and not representative of the current PM load that is present in the ambient air of the Bay area.

Page 3-24, Table 3-7 Summary of PM Emissions from Wood Burning Devices by County.

The data depicted on this Table appears to support the concept that fireplaces and not woodstoves are the chief contributor to PM₁₀ and PM_{2.5} emissions. The columns in the Table depicting data of emissions from wood burning stoves does not differentiate between EPA certified and non-EPA certified equipment.

2-2

I see it as logical and in keeping with the objectives of EPA's certification program for wood stoves to hold the view that if a differentiation was made between EPA Certified and non-EPA certified stoves the actual emission profile would show a lower amount of emissions for the stoves which are EPA certified.

It is my view that the use of EPA Certified wood stoves during STAT designated times would not represent a significant contributor to PM in the air.

Page 3-26, Section 3.2.3.1 – In this section the stated objective of the proposed rule is repeated, i.e. to reduce the PM₁₀ and PM_{2.5} emissions. Based on the data presented in Table 3-7 it appears that allowing the use of EPA certified equipment would not compromise that objective.

2-3

In addition the first paragraph in this section highlights a logical incongruity inherent in the proposal, i.e. the proposed rule will specify that only EPA certified equipment can be used in new construction or remodeling however that same equipment cannot be used on certain days specified by the BAAQMD.

Page 3-28, Section 3.2.3.3 – The last paragraph on this page contains more data supporting the view that EPA certified equipment is not the significant contributor to the PM₁₀ and PM_{2.5} in the Bay area. The section states that only 4.5 % of Bay area households own and use wood stoves vs. 36% of households having and using fireplaces. The data also demonstrates that fireplaces are the “device” in which most logs are burned. Fireplaces are therefore the primary source of significant PM.

2-4

However once again there is no differentiation between EPA certified and non-EPA certified equipment which would demonstrate that EPA certified is more efficient in terms of not releasing fine particles into the air.

Thank you for the opportunity to comment on the DEIR.

Air Pollution Articles of Interest.

1. EcoBlog
http://blog.lib.umn.edu/tupp0008/environment/2008/03/chinas_air_pollution_an_intern.html
2. China Air Pollution reaches US
<http://www.cbsnews.com/stories/2006/07/28/ap/national/mainD8J53RV01.shtml>
3. NYTimes article from 2006
http://www.nytimes.com/2006/06/11/business/worldbusiness/11chinacoal.html?_r=1&oref=slogin
4. Wood Boilers Cut Heating Bills – Secondhand smoke?
<http://www.nytimes.com/2006/12/18/nyregion/18wood.html>
5. China’s Next Big Boom could be the Foul Air
<http://www.nytimes.com/2005/10/30/weekinreview/30yardley.html>

COMMENT LETTER NO. 2
P. MICHAEL DUBINSKY, CITIZEN
MAY 28, 2008

Response 2-1

The proposed new rule is intended to reduce fine airborne particulate matter from wood burning devices during those days when air quality is at its poorest, which is defined by the rule as forecast to exceed the National Ambient Air Quality Standard (NAAQS) for PM_{2.5}. Based on the District's ambient air monitoring network, these days occur during the winter when wind direction is from the east.

Particulates from China are typically at higher elevations, do not impact the Bay Area during days when the District is likely to be in excess of the PM_{2.5} standard, and are composed of material other than wood-smoke, namely desert sands and by-products of combustion from coal fired power plants. In addition, the District's air monitoring station along the coast demonstrates that sea salt is predominant on days with wind direction from the west; as stated prior, this occurrence does not coincide with elevated levels of wintertime PM. As such, this source is not a significant contributor to wintertime PM, which is when the District is likely to exceed the NAAQS.

The data used by the Air District to calculate the sources of fine particulate in the Bay Area utilizes the most current data available. The Air District has a network of PM monitoring stations throughout the Bay Area that utilize both, real time and filter analysis, for determining concentrations of fine PM. The Air District utilizes the most current state of the art monitoring methods and equipment in measuring fine PM.

Response 2-2

The proposed new rule is intended to reduce fine airborne particulate matter from wood burning devices during those days when air quality is at its poorest. Since all wood-burning devices contribute particulate air pollution during those days when air quality is at its poorest, curtailing use of all wood-burning device types is appropriate. The District is required to meet state PM_{10/2.5} standards by the earliest date achievable so all appropriate emission reductions are included.

Response 2-3

See Response 2-2 above.

Response 2-4

See Response 2-2 above.

From: Mike Martin [mailto:raminduction@vom.com]
Sent: Monday, May 12, 2008 9:28 PM
To: Eric Pop
Subject: draft EIR, Reg. 6 Rule 3

Dear Mr. Pop;

I've read this EIR, and after being assured that those of us in rural areas would be exempt from this onerous regulation, I have failed to see any language to back up the statements made to (yet again) fool the public.

The only wording even close to what your BAAQMD representatives have stated ("those not connected to natural gas would be exempt") is found on page 2-8 of the referenced report in "Burning Curtailment": "An exemption would be provided if wood burning was the SOLE source of heat for a home". Given the weasels we have as politicians and unelected dictators, this is so open to interpretation it is nearly a full employment clause for lawyers, and of course a back door method of screwing everyone outside the urban rabbit warrens.

Do you think that perhaps more specific language might be used so there is no chance for obfuscation, dissembling, and equivocating? Perhaps something to this effect: this regulation does NOT apply to those living outside city limits and in un-incorporated areas that are NOT hooked up to utility provided natural gas.

Yes, this is of great concern to me as I live in a rural area not served by utility provided natural gas. We do have utility provided electricity (unreliable in good weather and even worse in inclement weather), but if a power outage co-incides with one of your STAT situations, I do NOT like the idea that the GESTAPO or KGB will be kicking down my front door and my family experiences a Elian Gonzales, Branch Davidian, Ruby Ridge, or Mormon situation because some self-righteous urbanite or allergy sufferer denounces me for crimes against humanity by having a fire when the power is out in a pc determined STAT event.

A bit of plain English reassurance will go a long ways in this matter.

Sincerely,

Mike Martin
Sonoma County

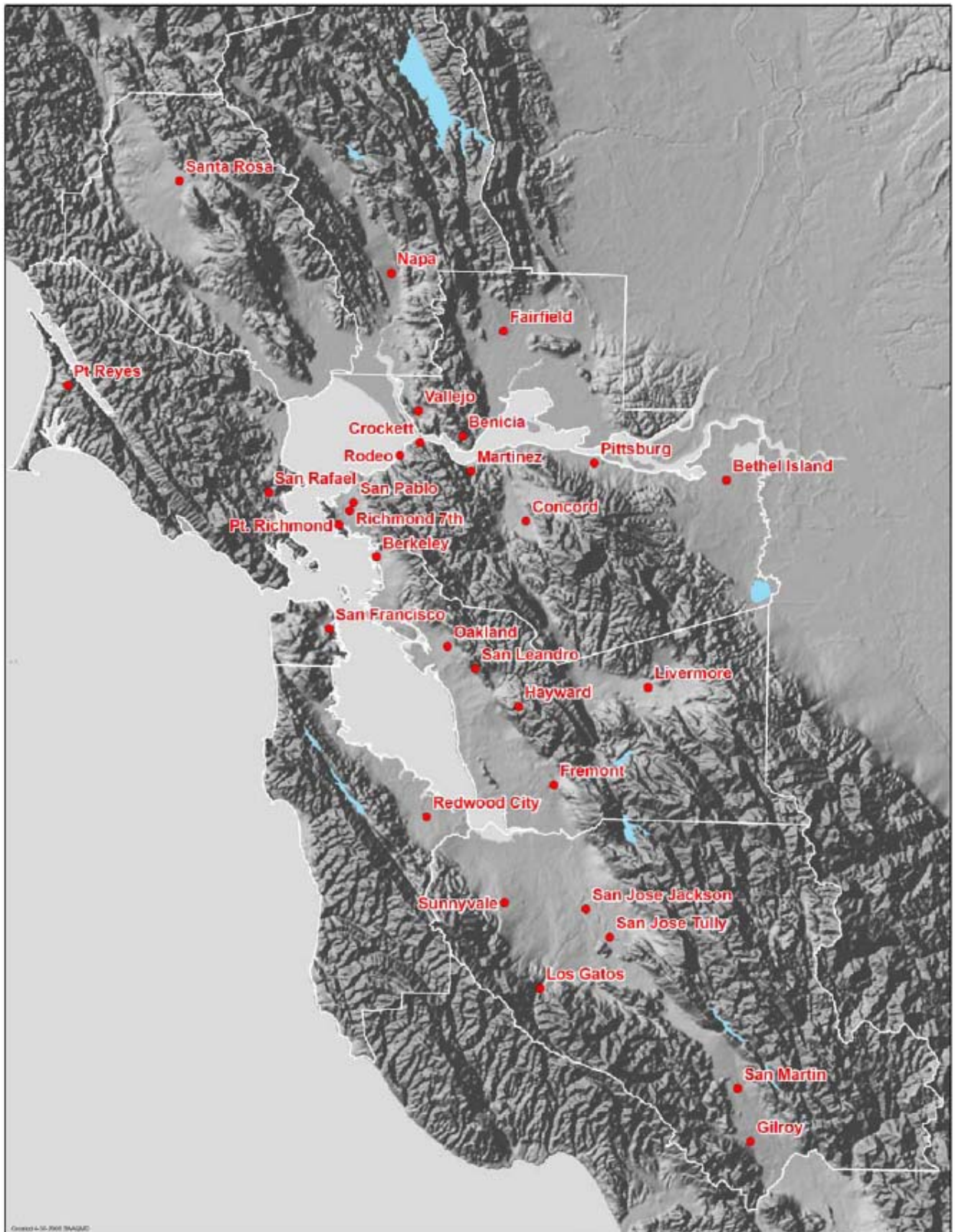
**COMMENT LETTER NO. 3
MIKE MARTIN, CITIZEN,
MAY 12, 2008**

Response 3-1

The rule exempts any person who operates a wood-burning device in an area where natural gas service is not available and does not apply to any person whose only source of heat for residential space heating is a wood-burning device.

Appendix F
District Monitor Sites for 2007

BAY AREA AMBIENT AIR MONITORS SITES 2007



PM2.5 Maximum 24 hr					
	2002	2003	2004	2005	2006
North Counties	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Santa Rosa	51	39	27	34	59
Vallejo	72	31	40	44	42
Coast & Central Bay					
San Francisco	70	42	46	44	54
Eastern District					
Concord	77	50	74	49	62
Livermore	62	42	41	32	51
South Central Bay					
Fremont	48	34	40	34	44
Redwood City	43	34	36	31	75
Santa Clara Valley					
San Jose Central	58	56	52	55	64
San Jose, Tully Road	54	52	45	51	31

On Dec. 17, 2006, the U.S. EPA implemented a more stringent national 24-hour PM2.5 standard—revising it from 65 µg/m3 to 35 µg/m3—and revoked the national annual average PM10 standard.

PM2.5 exceedance days for 2006 reflect the new standard.

San Jose-Tully PM2.5 monitoring was discontinued on September 30, 2006 in preparation for moving to Gilroy in 2007.

Bay Area Ambient Air Monitoring Sites

Site	Full Station	Type	Monitoring Objective	Pollutants Monitored
1	Bethel Island	SLAMS	Regional Transport & Highest Concentration	OB3B, NOB2B, SOB2B, CO, PMB10
2	Concord	SLAMS	Population Oriented, Highest Concentration	OB3B, NOB2B, SOB2B, CO, HC, PMB10B, PMB2.5
3	Freemont	SLAMS	Population Oriented	OB3B, NOB2B, CO, HC, PMB10B, PMB2.5
4	Livermore	SLAMS	Population Oriented & Highest Concentration	OB3B, NOB2B, CO, HC, PMB10B, PMB2.5B, PMB2.5cont
5	Napa	SLAMS	Population Oriented	OB3B, NOB2B, CO, PMB10B, PMB2.5cont
6	Oakland	SLAMS	Population Oriented	OB3B, NOB2B, CO
7	Pittsburg	SLAMS	Population Oriented	OB3B, NOB2B, SOB2B, CO
8	Redwood City	SLAMS	Population Oriented	OB3B, NOB2B, CO, PMB10B, PMB2.5B, PMB2.5cont
9	San Francisco	SLAMS	Population Oriented	O3, NOB2B, SOB2B, CO, HC,

				PMB10B, PMB2.5B, PMB2.5cont
10	San Jose	SLAMS	Population Oriented & Highest Concentration	O3, NOB2B, CO, HC, PMB10B, PMB2.5B, PMB2.5contB
11	San Pablo	SLAMS	Population Oriented	O3, NOB2B, SOB2B, CO, PMB10
12	San Rafael	SLAMS	Population Oriented	O3, NOB2B, CO, PMB10
13	Santa Rosa	SLAMS	Population Oriented	O3, NOB2B, CO, PMB10B , PMB2.5B
14	Vallejo	SLAMS	Population Oriented	O3, NOB2B, SOB2B, CO, PMB10B, PMB2.5B, PMB2.5contB
Site	Partial Station	Type	Monitoring Objective	Pollutants Monitored
15	Crockett	SLAMS	Source Impact	SOB2
16	Fairfield	SLAMS	Population Oriented & Regional Transport	OB3B
17	Gilroy	SLAMS	Population Oriented, Highest Concentration, & Regional Transport	OB3B, PMB2.5B
18	Hayward	SLAMS	Population Oriented & Regional Transport	OB3B
19	Los Gatos	SLAMS	Population Oriented & Highest Concentration	O ₃
20	Martinez	SLAMS	Source Impact	SOB2B
21	Pt. Reyes (CARB Operated)	SLAMS	General Background	PMB2.5cont
22	Pt Richmond	SLAMS	Source Impact	HB2BS
23	Richmond 7 th	SLAMS	Source Impact	SOB2B, HB2BS
24	Rodeo	SLAMS	Source Impact	HB2BS
25	San Jose Tully	SLAMS	Population Oriented & Highest Concentration	PMB10B
26	San Leandro	SLAMS	Population Oriented	OB3B
27	San Martin	SLAMS	Highest Concentration	OB3B
28	Sunnyvale	SLAMS	Population Oriented	OB3B
Site	Non-SLAMS Monitors	Type	Monitoring Objective	Pollutants Monitored
29	Benicia	SPM	Population Oriented & Source Impact	OB3B, NOB2B, SOB2B, CO, PMB10B, PMB2.5contB
30	Berkeley	SPM	Population Oriented & Source Impact	OB3B, NOB2B, SOB2B, CO, HC, PMB10B, PMB2.5cont
31	Oakland	SPM	Population Oriented	PMB2.5
32	San Jose	STN	Population Oriented	Speciated PMB2.5
33	San Jose	NATTS	Population Oriented	CO, Toxics, Black Carbon

Definition of Terms

ADT	Average Daily Traffic
AQS	Air Quality System; the EPA national air quality database
Air District	Bay Area Air Quality Management District
BAM	Beta Attenuation Monitor, a type of continuous PM _{2.5} monitor
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CHB ₄	Methane
Design Value	A calculated concentration, using a methodology specific to each pollutant, which is compared with the applicable national standard to determine the attainment status of an area for that pollutant.
EPA	U. S. Environmental Protection Agency
FRM	Federal Reference Method
GIS	Geographic Information System
HC	Hydrocarbons, including CHB ₄ B and NMOC
HiVol	High Volume
KM	Kilometer (0.62 miles per kilometer)
M	Meters
Maintenance Plan...	A Plan submitted by states to EPA that outlines how the NAAQS will be maintained for a particular region.
MSA	Metropolitan Statistical Area
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NATTS	National Air Toxics Trends Stations
NMOC	Non-methane Organic Carbon
NO ₂	Nitrogen Dioxide
O ₃	Ozone
PM	Particulate Matter
PM _{2.5}	Particulates less than or equal to 2.5 microns in size measured using a filter-based monitor
PM _{2.5cont}	Particulates less than or equal to 2.5 microns in size measured using a continuous monitor
PM ₁₀	Particulates less than or equal to 10 microns in size
RAAS	Reference Ambient Air Sampler
S	Seconds
SIP	State Implementation Plan – A Plan submitted by states to EPA that outlines how the NAAQS will be met for a particular region.
SLAMS	State or Local Air Monitoring Station
SOB ₂ B	Sulfur Dioxide
SPM	Special Purpose Monitor
STN	Speciation Trends Network – Speciated PM _{2.5} monitoring

Appendix G
December 2007 Workshop Comment Summary

Name	Subject
A. Barr	Workshop Attendee
aaron girard	Help End Wood Smoke Pollution
Aaron Read	Woodburning
Al Kruger	Proposed Regulation 6, Rule 3 to control...emissions...wood burning devices
Alan Montgomery	Workshop Attendee
Alan Pryor	Comments re Proposed Wood-Burning Rule
Alan Pryor	Modeling Wood Smoke Pollution on a Neighborhood Level
Alan Pryor	Workshop Attendee
Albert Rothman	supports regulation
Albert Rothman	Workshop Attendee
Albert Sekela	Resend: rules concerning fireplaces
Albert Sekela	Rules concerning fireplaces
Albet Sekela	Workshop Attendee
Alexander Pappas	Help End Wood Smoke Pollution
Al-Hadithy, Nabil	FW: Wood Smoke
Al-Hadithy, Nabil	Smoke
Alice Polesky	Help End Wood Smoke Pollution
Alicia Sullivan	Help End Wood Smoke Pollution
Allen Martin	Workshop Attendee
Allen Tacy	Other sources should be curtailed on high pm days
Amin Arikat	Help End Wood Smoke Pollution
Amira Hasenbush	Help End Wood Smoke Pollution
Ana Rudolph	Help End Wood Smoke Pollution
Andrea Fitzpatrick	Help End Wood Smoke Pollution
Andres Martinez	Workshop Attendee
Andrew Bezella	Help End Wood Smoke Pollution
Andrew Rosner	Re: My opposition to proposed new rule to ban burning of firewood in Bay Area home fireplaces on days when air quality is poor
Angelo and Jeanne Misthos	Regulation 6, Rule 3 Wood-burning Devices.
anita gardner	Wood Burning Regulation
Anna G	Fireplace burning and air pollution
Anne Erski	Workshop Attendee
Anne Krilanovich	Fireplace issue in San Francisco
Annie Ryan	Workshop Attendee
Anthony B. Varni	exemptions for rural areas
Anthony Kumashka	Workshop Attendee
Anthony Sacco	New Regulation 6, Rule 3: Wood-Burning Devices
Antonia Salerno	Workshop Attendee
Arlene Bush	Workshop Attendee
Armanini, John	Fire place smog
arslaby@juno.com	wood burning fireplaces
Asa Bradman	Comment: Fireplace restriction rules
Attard Tony	Wood burning?
Barbara and Stephen Devin	Supports regulation
Barbara Corna	fireplace ban
Barbara Kossy	I support fireplace regulation.
Barbara Langham	Help End Wood Smoke Pollution
Barbara Moulton	Workshop Attendee

Barbara Viken	Help End Wood Smoke Pollution
Barbara Vollendorf	Help End Wood Smoke Pollution
Barnaby Galls	Workshop Attendee
Bart Wor ley	ban wood fires, yes
Bartt Emerson	Help End Wood Smoke Pollution
Beatrice Howard	Help End Wood Smoke Pollution
Ben Desrosiers	Workshop Attendee
Ben Sotero	Workshop Attendee
Ben Sotero	Workshop Attendee
Beth Keer	re wood fire ban
Beth Marting	Workshop Attendee
Betty Heryfaro	Workshop Attendee
Beverly Perrin	Workshop Attendee
Bill A.	Workshop Attendee
Bill Bozym	PARTICULATE MATTER AND VISIBLE EMISSIONS
Bill Redcers	Workshop Attendee
Bill Siegmund	Workshop Attendee
Bob and Terri Rasters	Workshop Attendee
Bob Garcia	Ban on fireplace use
Bob Goldthwaite	Regulation 6,Rule3
Bob Marek	Workshop Attendee
Bollinger, Amy	SF Chronicle Wood smoke Article
Bonne Dreger	Workshop Attendee
Brad Cannon	Workshop Attendee
Brad Dauer	Question
Brian Jensen	Workshop Attendee
Brian Smalley	Help End Wood Smoke Pollution
Bruce Herold	End Wood Smoke Pollution
Bruce Mirken	Proposed wood-burning fireplace rule
Bruce Ramsay	limits on residential woodburning
Bruce Ramsay	Workshop Attendee
C. Fildes	Wood Burning Ban
Carmen A. Klucsor	Help End Wood Smoke Pollution
Carol and Peter Herzog	Workshop Attendee
Carol Conrad	Help End Wood Smoke Pollution
Carol Evans	Wood Burning
Carol Kiser	Fireplace Ban
Carol Lawson	Workshop Attendee
Carol Portal	Workshop Attendee
Carol Vellutini	Help End Wood Smoke Pollution
Carole Grace	wood smoke
Carole Grace	wood smoke
Carole Grace	Workshop Attendee
Caroline Poage	Opposes regulation
Carolyn Marshall	Help End Wood Smoke Pollution
Carolyn Nash	Help End Wood Smoke Pollution
Catherine Arnold	wood smoke pollution
CATHRYN ZELENY	woodsmoke
CBauer@bart.gov	fireplaces
Cecil Bruce Shaver	Opposes regulation

Charley Adams	Workshop Attendee
charlotte	fireplace burning
Chris Caron	Regulation 6, Rule 3
Chris Knight	Workshop Attendee
Chris Yonts	Help End Wood Smoke Pollution
Christin Camilleri	Workshop Attendee
Christine Camilleri	Re: new rule
Christine Kidd	Help End Wood Smoke Pollution
Christine Lu	Help End Wood Smoke Pollution
Christy Artz & Harold Erdman	Yes on the Proposed Bay Area Fireplace Restrictions
CHUCK KINKEY	Help End Wood Smoke Pollution
Chuck Riess	Help End Wood Smoke Pollution
Cindy & Bill Scott	Fireplace smoke
Courtney Gartin	Help End Wood Smoke Pollution
Craig Harrison	Opposes regulation
Craig Keith	Regulation 6, Rule 3
Craig Roth	economic concerns of proposed regulation
Cyndee Soriano	Feedback on Proposed Wood Burning Regulation 6
Dale Ploeger	Proposed fireplace ban
Dan and Toni Behne	Workshop Attendee
Dan Demers	My thoughts
Danielle Conrad	Comments on Wood Burning Draft
Darrin Jenkins	Support Proposed New Regulation 6, Rule 3: Wood-Burning Devices
Darron Springer	Workshop Attendee
Dave Bartholomew	Fireplace Ban
Dave Giordano	Workshop Attendee
David Carlson	Help End Wood Smoke Pollution
David Ehrhardt	
David Gamlowski	Smog board wants to ban wood fires on bad-air nights in winter
David Loy	Fireplace Ban
David M	Wood burning fireplace ban
David Mushnell	Workshop Attendee
David Oliver	Proposed Ban on Fireplace Use on Bad Air Nights
David Robinson	Help End Wood Smoke Pollution
	Researching Clean Energy (CLNE) Willing to pay for brief phone consult: Zintro 1102A
David Sim	
David Theodoropoulos	EJ issues, carbon neutrality of wood burning, sustainability concerns
David Wolf	Help End Wood Smoke Pollution
Debbie Bliss	Wood Stove Ban
Denis Ring	Wood Burning Ovens
Dennis Archer	Workshop Attendee
Dennis Justus	Workshop Attendee
Diana P.	Workshop Attendee
Diane Levinson	Workshop Attendee
Diane Peterson	Workshop Attendee
Diane white	Help End Wood Smoke Pollution
Dick Eckstein	Workshop Attendee
DMH	Thank you!
Donald Podesta	Questions???
Donald Rued	Comment on draft regulation 6 rule 3

Donn Parker	Reg 6-3-403 Suggested new Solid Fuel label
Donn Parker	Workshop Attendee
Dotty Hopkins	Help End Wood Smoke Pollution
Douglas Estes	Help End Wood Smoke Pollution
Dr. Bruce Richman	New Regulation 6, Rule 3: Wood-Burning Devices
Dr. Kurt Gamara	Wood Smoke Reduction Program- J. Silva-4
Dr. Susan Dixon, Ph. D.	Reg. 6, Rule 3
Ed Leong	Comment: Regulation 6, Rule 3: Wood-Burning Devices
Eduard Flores	Help End Wood Smoke Pollution
Ehrat, Steve	Fireplace Pellets
Eleanor Butchart	Workshop Attendee
Elisabeth Jewel	FW: Duraflame comments on Reg. 6 Rule 3
Ellen Ko	Help End Wood Smoke Pollution
Ellen Levine	Help End Wood Smoke Pollution
Emory Montage	Workshop Attendee
Eng, Albert	wood stove
Eric Brouillette	Reg6 Rule3
Eric Brouillette	Workshop Attendee
Erin Lamberger	Questions regarding proposed regulations
Erin Lamberger	Workshop Attendee
Esther Roberts	Help End Wood Smoke Pollution
Eva Doering	woodsmoke
Faelz, Steven	fire place burning
Farida Fox	Workshop Attendee
Farisato, Victor	Fireplace Wood Burning Ban
Fernandes	Workshop Attendee
Finton, Michelle	ban on wood burning
Frances Hailman	Help End Wood Smoke Pollution
Frances McGoohan	Banning wood fires
Frank Nieman	Workshop Attendee
Fred Doolittle	Workshop Attendee
Fred Mundy	new regulation
Frederic Le	Workshop Attendee
G. Bronken	Workshop Attendee
Gail Fenton	Workshop Attendee
Gail Shearer	Workshop Attender
Gary Kozel	You've Made National News
Gary Kozel	New Fireplace Insert Regulations
Gary Nickillon	Workshop Attendee
Gayle Rubin	questions about new regulations
Geil Witt	Workshop Attendee
Geof Post	Fireplace ban - strongly in favor of it!
George Ehrdman	NSCAPCD Comments on Reg 6
George Erski	Workshop Attendee
George J. Nesbitt	Draft Regulation 6, Rule 3, coments
GEORGE LISTER	Proposed ban on woodfires from 11/6/07 SF Chronicle
Georgia Marshall	Workshop Attendee
Gerald Wheeler	proposed fireplace ban
Gerry Derrington	Workshop Attendee
Gerry Derrington	Workshop Attendee

Giel Witt	Wood Stove Regulations
GOGAS, SANDRA T (ATTSI)	Thank you - as someone with allergies and asthma
goyhy@yahoo.cn	
Grace Bates	Workshop Attendee
Grace, Dale	ban wood-burning in metropolitan areas
Greg Harris	Workshop Attendee
Guy Fasanaro	Workshop Attendee
Harold Gower	Workshop Attendee
Harriet Charney	Help End Wood Smoke Pollution
Harrison, Craig	Comments on Proposed Regulation 6, Rule 3: Wood-Burning Devices
Harrison, Craig	Queries re New Regulation 6, Rule 3: Wood-Burning Devices
Helen Neville	Fireplaces
Herbert Yee	wood burning ban
Hoffmann, Alec	Proposed Woodsmoke Regs
Hoffmann, Alec	Question re draft regs
Hoffmann, Alec	Wood burning device regs questions
Irina Worthey	Help End Wood Smoke Pollution
J. Beach	Workshop Attendee
J. Claire Green, N.D.	Wood burning stove regs
J. Hughes	Workshop Attendee
j. robert	New Regulation 6, Rule 3: Wood-Burning Devices
Jack and Flo Bras	Workshop Attendee
Jack Dillon	Workshop Attendee
Jack Klock	Wood Smoke Pollution Ban - Open Letter to BAAQMD
Jack Klock	Wood Smoke Pollution Ban
Jacqueline Williams, ph.D	Help End Wood Smoke Pollution
James Nielsen	Proposed fireplace-fire ban
James Parks	Workshop Attendee
James Peck	Comments on Proposed Wood Smoke Regulations
James Sayre	Opposes regulation
Jan DeMaria	Help End Wood Smoke Pollution
Jane Allewelt	Workshop Attendee
Janet Glasgow	RE: Nothern Sonoma
Janet Glasgow	RE: Comment extension request
Janice Gloe	Help End Wood Smoke Pollution
Janice Stern	Workshop Attendee
Janis Palmer	economic concerns of proposed regulation
Jay Halcomb	Wood-burning devices ordinance - Sierra Club support
Jay Morse	Protest of New Regulation 6, Rule 3: Wood-Burning Devices
Jeff Landry	Fireplace Ban
Jen Rios	Help End Wood Smoke Pollution
Jennifer Alverson	FW: JPrjoposed wood fire restrictions
Jennifer Alverson	FW: Woodburning
Jennifer Alverson	wood burning regulation emails
Jennifer Chandler	fireplace ban
Jenny Bard	ALAC Letter on Wood Smoke Regulation
Jenny Bard	ALAC Comments on Wood Smoke Regulation
Jenny Bard	Workshop Attendee
Jerry Neufeld	Workshop Attendee
Jessica DiCamillo	Help End Wood Smoke Pollution

Jim Allen	Workshop Attendee
Jim Corcoran	Workshop Attendee
Jim Newell	Proposed ban on Fireplace fires
Jim Wert	wood burning ban
Joan Breiding	Help End Wood Smoke Pollution
Joan Walsh	Workshop Attendee
Joel Blatt	Comments on new regulations restricting use of wood-burning devices
Joel Ervice	Help End Wood Smoke Pollution
Joel Jensen	Workshop Attendee
Joel Moskowitz	Help End Wood Smoke Pollution
John Adams	NO fireplace ban
John Bess III	Help End Wood Smoke Pollution
	HPBA, and HPBA Pacific comments regarding the districts proposed rule 3
John Crouch	
John Crouch	RE: Comment extension request
John Crouch	RE: Comment extension request
	request for a copy of the presentation to the stationary source committee
John Crouch	
John Crouch	Comment extension request
John D. Taddeucci	Opposes regulation
John Davis	EPA certified devices burn clean and should be allowed, cost analysis
John Davis	Workshop Attendee
John Holtzclaw	Help End Wood Smoke Pollution
John K. Kenny	Workshop Attendee
John Nicoles	Curtailement of wood burning will contribute to wildfire fuel load
John Nicoles	Workshop Attendee
John Riscoll	Workshop Attendee
John Spina	Workshop Attendee
John Upton	New Regulation 6, Rule 3: Wood-Burning Devices
Johnny Jaramillo	wood burning fireplace controls
johnsen cyndy	banning wood-burning fireplaces
Jonathan Bornstein	Wood Fire Ban Bad Idea
Jose Ricardo Bondoc	Help End Wood Smoke Pollution
Joseph Held	Fire Ban
Joseph S. Christensen	proposed fireplace ban
Josh Jaffe	Workshop Attendee
Joyceanne Beachem	Wood Burning
Julene Freitas	Help End Wood Smoke Pollution
Jules V.	Workshop Attendee
Julie Bennett	House Fire Places
Julie McKown, RRT	Help End Wood Smoke Pollution
Julio Focaracci	Status of Wood Burning Restrictions?
Jun	Plastic in Wood Burning Fireplaces
Kamila Kennedy	wood burning fireplaces
Karen Baxter	Help End Wood Smoke Pollution
Karla Noyes	11-8-07 public remarks Wood Smoke Regulation Workshop
Kathleen Wooster	wood burning ban
Kathy Brady	Workshop Attendee
Kathy McMorow	Comment on proposed wood-burning rule
Kathy Voss	Comment re: Regulation 6, Woodsmoke

Kathy Voss	Questions re: Reg 6-3 regarding Wood-burning Devices (WBD)
Kathy Voss	Questions re: Reg 6-3 regarding Wood-burning Devices (WBD)
Kathy Voss-Jensen	supports regulation, enforcement concerns, provide financial incentives
Ken Boonie	Workshop Attendee
Ken Burke	Help End Wood Smoke Pollution
Ken Crownover	Workshop Attendee
Ken Davis	Workshop Attendee
Keven McAndrews	Workshop Attendee
Kevin Carley	Workshop Attendee
Kevin T. Heaney	Fireplace
Kimberley Meier	Woodburning Fires
Kip Maly	woodfire ban
KL Matlock	Help End Wood Smoke Pollution
Kurt Gamar	Workshop Attendee
	Comments re Proposed New Regulation 6, Rule 3: Wood Burning Devices
Kurt Kearl	Wood burning ban
Laura Rawson	Help End Wood Smoke Pollution
laura Berke	Workshop Attendee
Laura Marshall	Help End Wood Smoke Pollution
Lawrence Mintz	wood burning fireplaces proposed ban
leebfitz	OPPOSED to ban with fines for wood fires
Len Gilbert	Workshop Attendee
Leo Ryan	Opposes regulation
Leoanard Carl	Help End Wood Smoke Pollution
Leslie Hata	Workshop Attendee
Lia Gaertner	banning fireplaces
Linda Donaghue	Workshop today
Linda Civitello-Joy	Help End Wood Smoke Pollution
linda regan	Workshop Attendee
Linda Regan	Workshop Attendee
Linda Regan	firewood for the urbanites
Linda Turney	Help End Wood Smoke Pollution
Linda Weiner	Woodsmoke Ban
Lionel de Maine	Regulation of Outdoor Wood Burning
Lisa Crystal	Workshop Attendee
Lisa Crystal	Wood-Burning Regulations
Loel McPhee	Workshop Attendee
Lorraine Kilkenny	What does Live Webcast mean regarding the Wood Smoke Workshops
Lynn Miller	Workshop Attendee
M.T. Kelly	Help End Wood Smoke Pollution
Madelyn Weiss	Banning wood smoke on bad air days
madelyn weiss	Banning Woodsmoke
Maile Springer	Workshop Attendee
Malcolm Douglas	support for fireplace ban
Malone, Ruth	Workshop Attendee
Mamison Crosby	Workshop Attendee
Marcela Castarion	ban on fires at home
margaret degliantoni	Help End Wood Smoke Pollution
margaret murphy	Oppose Ban on Wood Burning
Margaret Sheneman	

marge murphy	woodsmoke burning
Maria Kleczewska	Please ban wood fires
Marian Springer	Workshop Attendee
marianne metallo	Help End Wood Smoke Pollution
Marie Witt	Workshop Attendee
Marilyn Phillips	Help End Wood Smoke Pollution
Mark Blaszczyk	Comment & Question on Wood Burning Restriction
Mark J. Fiore	Help End Wood Smoke Pollution
Mark Purdy	Wood Smoke Regulations
Mark_Wenslawski	no ban
Martha_Stafford@URSCorp.com	Fireplace Smoke Regulations
Martin Dvorin	Workshop Attendee
marv wexler	Proposed Regulation 6 Rule 3 - Stricter Than Denver Regulations -
Marv Wexler	Woodburning Rule
Mary Bennett	Workshop Attendee
Mary Bohman	Workshop Attendee
Mary Eaton Fairfield	Help End Wood Smoke Pollution
Mary Romaidis	RE: proposed fireplace ban
Matilde Leonetti	Commercial Wood Burning Ban?
Matt Coyliz	Workshop Attendee
matt eremko	Cleaner burning devices should be exempted
Max Curtis	proposed fireplace ban
Max Kaehn	Please help end wood smoke pollution
Melissa Bastianon	Workshop Attendee
Melissa Hippard	Sierra Club comments
Melissa Lynn	Help End Wood Smoke Pollution
Michael Danskin	Workshop Attendee
Michael Denton	Help End Wood Smoke Pollution
Michael Kent	wood stove reg
Michael Kent	Workshop Attendee
Michael Laybourn	FW: Proposed Rule 445 (Wood Burning Appliances)
Michael Mack	comments on proposed change to wood burning fireplace rules
Michael Mitsuda	Help End Wood Smoke Pollution
Michael Rubin	Help End Wood Smoke Pollution
Michael Schwab	Ban fires when air quality is poor
Mike Cheponis	Workshop Attendee
Mike Dubinsky	Workshop Attendee
mike fitch	New R & R's pertaining to Wood Burning
Mike Kelley	Workshop Attendee
Mike Martin	re: Fireplace ban
Mike Sage	Workshop Attendee
Mike Sasnett	Yes - Ban wood fires!
Mike Scott	Help End Wood Smoke Pollution
Mike Tallmadge	Help End Wood Smoke Pollution
Mona Wright	Woodsmoke
Mushell, David E	Please ban wood burning altogether
Nadine Hack	Wood fire ban
Nancy Cohrs	Hooray for fireplace bans
Nancy Kramer	Help End Wood Smoke Pollution
nancy locke	wood fire ban

Nancy Steele	Ban on wood burning
Nedka Manolski	Help End Wood Smoke Pollution
Nick Loukianoff	Workshop Attendee
Northern Sonoma County APCD	Proposed Wood Burning Devices Rule
Pamela Granger	Help End Wood Smoke Pollution
Pamela Green	Help End Wood Smoke Pollution
Pat F.	Workshop Attendee
Pat Sanchez	EJ, voluntary approach
patricia barnes	Help End Wood Smoke Pollution
Patricia Briskin	woodburning stoves
Patricia Briskin	Workshop Attendee
Patricia O'Gillooly	Fireplace ban
Paul Rostor	Workshop Attendee
Paul Schmidt	Workshop Attendee
Paul Speigel	Workshop Attendee
Paul Spiegel	Supports regulation
Penelope Terry	Help End Wood Smoke Pollution
Peter Grenell	woodsmoke and fireplace restrictions
Peter Smalley	Fwd: Fireplace regulations
Peter Smalley	Fireplace regulations
Peter Smalley	Workshop Attendee
Petria MacDonnell	Workshop Attendee
Pgstocker@aol.com	burning wood
Phil Bray	Fireplace ban
Phillipa Lion	Proposed Fireplace Ban
Poe Asher	fireplace ban
Polly Taylor	Help End Wood Smoke Pollution
Prof.John Delevoryas	Help End Wood Smoke Pollution
R R	wood burning appliance comments
R. James	wood burning fireplaces
R. James	Help End Wood Smoke Pollution
R. Peter Haddad	proposed ban on wood burning for residential heating
Ralph Morales	Help End Wood Smoke Pollution
Ramona Cardon	Help End Wood Smoke Pollution
Randall Tyers	Please Help End Wood Smoke Pollution
Ray Spencer	Workshop Attendee
rebecca koo	Help End Wood Smoke Pollution
Rex Spross	Workshop Attendee
Richar Schubert	Workshop Attendee
Richard Cooper	Help End Wood Smoke Pollution
Richard Gasser	Help End Wood Smoke Pollution
Richard Parker	Constituionality of rule and rule development process
Richard Parker	Workshop Attendee
Richard S.	Workshop Attendee
Richard Shubert	Workshop Attendee
Richard_Benton@ajg.com	Opposed to Wood Fire ban
Robert Bailey	Proposed rule regarding wood burning devices
Robert Poindexter	Proposed Regulation on Wood-Burning Devices
Robert Poindexter	Comments and New Regulation 6, Rule 3: Wood Burning Devices
Robert R. Champion	Fireplace Ban...

Robert Yeager	Eco-nonsense
Roberta E. Newman	Help End Wood Smoke Pollution
Rod Wentler	Workshop Attendee
Rofo Moreno	Wood Burning devices
Romas	Wood smoke ordinance
Ron Avila	Help End Wood Smoke Pollution
Ron Carherey	Workshop Attendee
Ron Edwards	fireplace
Ronald Portal	Workshop Attendee
Russ Tucker	proposed fireplace wood burning ban
Ruth Scotto	Workshop Attendee
Ruth Waldhauer	RE: Proposed Regulation 6, Rule 3
Ruth Waldhauer	Workshop Attendee
Ruth Washauer	information request
Sahara Shaeffer	Workshop Attendee
Sam Fedeli	Exemptions for holidays from curtailment
Samuel Ford	Help End Wood Smoke Pollution
Sandee	proposed wood smoke rule
Sandra Brady	supports regulation
Sandy Dubinsky	Comments on the Proposed Wood Smoke Rule
Sandy Dubinsky	Question - Draft Wood Smoke Regulation
Sarah Barrs	Help End Wood Smoke Pollution
Sarah Kidd	Workshop Attendee
sarah shaeffer	Help End Wood Smoke Pollution
Sarvnaz Jedari	Help End Wood Smoke Pollution
Scott	wood fire ban...
Scott Litchfield	Opposition to proposal to ban fires in wood burning stoves
Serena Chen	Help End Wood Smoke Pollution
Sharon Anduri	Wood fire ban
Sheryl Land	ban wood-burning in fireplaces
Sol Cohen	Help End Wood Smoke Pollution
SpareTheAir	FW: feedback = how DARE you?!
SpareTheAir	FW: proposed fireplace ban
SpareTheAir	FW: Proposed Wood Burning Ban
SpareTheAir@baaqmd.gov	Air Quality Forecast
Srividya Daita	Help End Wood Smoke Pollution
Stanton	Pollution from fireplaces/wood burning stoves
Steinpress, Martin	Support for ban on wood burning during critical times
Steve and JoAnn Smith	Workshop Attendee
Steve Drenker	Opposed to fireplace restrictions
Steve Mankowski	New Regulation 6, Rule 3: Wood-Burning Devices
Steve Perry	Workshop Attendee
Steve Pulone	Workshop Attendee
Steve Soriano	wood smoke ruling
	Comment on: New Regulation 6, Rule 3: Wood-Burning Devices and Amendments to Regulation 5
Steve Wall	Workshop Attendee
Steve Wall	Workshop Attendee
Sue Beittel	Workshop Attendee
Susan Adler	controlling wood smoke
Susan Bryan	ban on wood fire smoke

Susan Goldsborough	Workshop Attendee
Susan Leiby	Workshop Attendee
susan marsh	Support for Regulation Banning Wood Burning in San Francisco
Susan Nordmark	proposed fireplace use ban
Susan White	proposed wood smoke rule
Suzanne Calmels	wood fire limits
Sydney Gurewitz Clemens	subsidize gas conversions!
T. Miller	Workshop Attendee
Tammie and Michael Foley	Workshop Attendee
Tammy Shubert	Workshop Attendee
Terrie Johnson	Workshop Attendee
tessa Woodmansee	SUPPORT FOR Wood burning Stove BAN
Theresa O'Brien	Help End Wood Smoke Pollution
Thomas Foxen	Expansion of the BUREAUCRACY
Tiffany Renee	Commenting on District Regulation 6, Rule 3: Wood-Burning Devices
Tim Barrington	Help End Wood Smoke Pollution
Tim Higgins	Workshop Attendee
Tim Moniz	Workshop Attendee
Tim Moniz	Workshop Attendee
Timothy Lippert	Help End Wood Smoke Pollution
Tom Bush	Workshop Attendee
Tom Foley	wood fire ban
Tom Kavishi	Workshop Attendee
TOM KNUTSEN	Wood burning restrictions/exemptions
Tom Krinken	Workshop Attendee
Tom Schwartz	Workshop Attendee
Tom Surh	question re woodburning
Tony Filice	Workshop Attendee
Tonya Southard	Help End Wood Smoke Pollution
Tracy Weatherby	Help End Wood Smoke Pollution
vaine	Fw: firewood burning
Vernon Huffman	comment on proposed burning ban
Veroncia Jacobi	Help End Wood Smoke Pollution
Vicki Walling	Workshop Attendee
W S (Bill) McCracken	smog board ban on wood fires in home fireplaces
W. Hurdlow	Workshop Attendee
Ware Kuschner	Help End Wood Smoke Pollution
Warren Glass	Workshop Attendee
Warren Gold	Help End Wood Smoke Pollution
William A. Hickey	Woodsmoke
William Bonacci	Woodsmoke
	Public comment on proposed regulation to limit the use of wood burning
William Elicson	appliances on Spare the Air Nights
William Morris	Workshop Attendee
Yuko Nakajima	Please Limit Wood Smoke Pollution
Yvette Edwards	Workshop Attendee
Thomas Carroll	Cleaner devices exempted, smaller curtailment zone
Jim Strahorn	Opposes Regulation
Linda Weiner	Supports Regulation
	Supports Regulation
Barbara Dubbs	

Patricia Jones
Carol Hazenfield

Supports regulation, needs to go further
Supports Regulation