SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Environmental Assessment:

Proposed Rule 445 – Wood Burning Devices

February 2008

SCAQMD No. 090207JK

Author:	James Koizumi	Air Quality Specialist
Technical Assistance:	Michael Laybourn	Air Quality Specialist
Reviewed By:	Steve Smith, Ph.D.	Program Supervisor, CEQA
	Jill Whynot	Director, Strategic Initiatives, Planning, Rules, and Area Sources
	Lee Lockie	Director, Planning, Rules, and Area Sources
	Tracy A. Goss, P.E.	Program Supervisor, PM Strategies
	Kurt Wiese	District Counsel
	Barbara Baird	Principal Deputy District Counsel
	John Olvera	Senior Deputy District Counsel

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Preface

This document constitutes the Final Environmental Assessment (EA) for the Proposed Rule 445 – Wood Burning Devices. The Draft EA was released for a 30-day public review and comment period from February 9, 2007 to March 13, 2007. One comment letter was received from the public and is included with response to comment in Appendix C. A number of public outreach meetings on proposed Rule (PR) 445 were held subsequent to release of the Draft EA, which has resulted in further changes to the proposed project. To ease in identification, modifications to the document are included as underlined text and text that is no longer relevant has been removed from the document and is indicated by strikethrough.

Brief summaries of the primary changes made to PR 445, subsequent to the release of the Draft EA for public review and based on comments received by the public on the proposed project are shown in the following bulleted items.

- In the version of PR 445 circulated in the Draft EA, the proposed project allowed the installation of EPA compliant wood burning devices in new development. PR 445 has been changed to prohibit the installation of wood burning devices in any new development.
- In the version of PR 445 circulated in the Draft EA, operators of commercial facilities were required to replace non-EPA compliant wood burning devices beginning January 1, 2010. This provision was removed.
- Dedicated gaseous-fueled device was added to the compliant devices allowed for sale, supply, or installation in existing structures.
- Used compliant devices were added to the list of devices allowed to be for sale, supply, or installation in existing structures, provided they met the criteria as listed in the rule.
- In the version of PR 445 circulated in the Draft EA, PR 445 prohibited any person from advertising; selling; or offering to sell, supply, or transfer any wood advertised, described or in any way represented to be seasoned unless the wood has a moisture content of 20 percent or less. PR 445 has been changed to require commercial firewood facility operators to sell only seasoned wood from July 1 through the end of February the following year. Any commercial firewood facility may sell seasoned as well as non-seasoned wood during the remaining months.
- In the version of PR 445 circulated in the Draft EA, the wood burning curtailment program was voluntary starting six months after rule adoption. This has been changed to a mandatory program proposed to start, if necessary, to meet air quality standards by November 1, 2013.
- Exemptions from the curtailment programs were added for residential or commercial properties where a wood burning device is the sole source of heat, low income households, residential or commercial properties where there is not existing infrastructure for natural gas service within 150 feet of the property line, and ceremonial fires.
- Although analyzed in the Draft EA, residential property transfer and public awareness information requirements have been removed from the proposed rule. Public outreach is still a major component, but not in rule language.
- Administrative requirements for notifying the public about curtailment days have been added.
- Penalties for violation of requirements of PR 445 have been added.
- Exceptions from fuel restrictions for wood burning devices have been added for property sale or transfer of existing development, new development where there is no existing

infrastructure for natural gas service within 150 feet of the property line or those 3,000 or more feet above mean sea level, and manufactured gas logs.

- An exemption from the prohibition of non-certified wood burning devices in existing structures has been added for properties that are registered as a historical site, or are contributing structures located in a Historic Preservation Overlay Zone, as determined by the applicable, federal, State, or local agency.
- The emissions inventory has been revised to reflect changes to PR 445 and to be consistent with the Staff Report.
- An assessment of greenhouse gas emissions was added and the impacts were determined to be non-significant.

Modifications to PR 445 have been reviewed and staff has concluded that none of the modifications alter any conclusions reached in the Draft EA, nor provide new information of substantial importance relative to the Draft document. The new information added to the EA merely clarifies or amplifies the requirements of the proposed project. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15073.5. This document constitutes the Final EA for Proposed Rule 445 – Wood Burning Devices.

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INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin (collectively known as the "district"). By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating attainment of all federal and state ambient air quality standards for the district[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The 2007 AQMP concluded that major reductions in criteria pollutant emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NOx) are necessary to attain the air quality standards for ozone, particulate matter with an aerodynamic diameter of 10 microns or less (PM10) and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5). Ozone, a criteria pollutant, is formed when VOCs react with NOx in the atmosphere and has been shown to adversely affect human health. VOC emissions also contribute to the formation of PM10 and PM2.5. The ~~Draft~~ 2007 AQMP has noted that the federal PM10 standard was exceeded in one location in the district. As a result, additional PM10 reductions are necessary to attain the federal PM10 standard and substantial PM10 reductions are necessary to attain the much more stringent state 24-hour standard. In 2005, the annual PM2.5 standard was exceeded at several locations throughout the Basin. However, the 24-hour PM2.5 standard (98^{th} percentile greater than 65 ug/m^3) was not exceeded during the year[4].

Wood burning for aesthetic and heating use is limited in southern California, but due to the large number of sources, emissions do contribute to exceedances of state and federal air quality standards for PM10 and PM2.5, collectively referred to as particulate matter or PM. (Wood burning can also produce carbon monoxide and toxic air contaminants.) As a result, both~~,~~ the 2003 and 2007 AQMPs included a control measure to reduce PM emissions from wood burning fireplaces and wood stoves[5]. The California Air Resources Board (ARB) has also developed a recommended control measure to reduce emissions from wood burning devices and other sources[6]. Many other air districts and states have developed wood smoke control programs with varying degrees of stringency, based primarily on local conditions; climate and other factors. Proposed Rule (PR) 445 – Wood Burning ~~Appliances~~ Devices has also been developed to assist in the attainment of state and federal PM standards for the SCAQMD's jurisdiction.

Staff research indicates that properly installed, operated and well maintained clean wood burning devices ~~appliances~~ significantly reduce emissions inside and outside of the home. The primary focus of the PR 445 and outreach program is to gradually phase-out less efficient wood-burning devices ~~appliances~~ and to educate the public on how to burn wood in a clean manner.

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[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health & Safety Code, §§40400-40540).

[2] Health & Safety Code, §40460 (a).

[3] Health & Safety Code, §40440 (a).

[4] In September 2006, U.S. EPA issued revised PM2.5 NAAQs lowering the 24-hr standard to 35 ug/m^3. However, the present Plan is not required to address this standard.

[5] Control Measure #2003MSC-06, http://www.aqmd.gov/aqmp/docs/2003AQMP_AppIVa.pdf - page IV-60

[6] ARB, Proposed List of Measures to Reduce Particulate Matter – PM10 and PM2.5, (Implementation of Senate Bill 656, Sher), Approved November 18, 2005

The following summarizes the main components of PR 445. PR 445 would prohibit the permanent installation of a wood burning device into any new development. Six months after adoption, proposed Rule 445 would prohibit the installation of a new wood burning device ~~appliance~~ unless they comprise the cleanest technologies available. PR 445 prohibits the installation of non-compliant wood burning devices. ~~Beginning in 2010, PR445 also prohibits new and existing commercial facilities from using uncontrolled wood burning devices.~~ PR 445 prohibits the burning of non-wood items such as trash, establishes moisture content standards for wood sold as seasoned, and includes a mandatory wood burning curtailment program during periods of poor air quality starting November 1, 2013. ~~Beginning in 2012, the proposal would also require the change-out of older wood heaters during property transfers in areas with high fine particulate matter concentrations~~. PR 445 includes exemptions from the provisions of (d)(1) cook stoves; the provisions from (d)(2) for installation of wood stoves into new developments where there is no existing infrastructure for natural gas services within 150 feet of the property line or those 3,000 or more feet above mean sea level; and from the provisions of (e) for curtailment requirements where wood burning devices are the sole sources of heat; low income households; burning of manufactured logs in wood burning devices; residential or commercial properties where there is not existing infrastructure for natural gas service within 150 feet of the property line, residential or commercial properties located 3,000 or more feet above mean sea level and ceremonial fires exempted under Rule 444- Open Burning. PR 445 includes a exemption to the prohibition of installing PR 445 non-compliant wood burning device in existing structures in structures that are listed in historical registries or located in historical overlay zones.

The Draft EA was circulated for a 30-day public review and comment period from February 9, 2007 to March 13, 2007. One comment letter was received from the public and is included with response to comment in Appendix C.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PR 445 is a discretionary action, which has potential for resulting in direct or indirect change to the environment and, therefore, is considered a "project" as defined by the California Environmental Quality Act (CEQA). SCAQMD is the lead agency for the proposed project and has prepared this ~~draft~~ Final Environmental Assessment (EA) with no significant adverse impacts pursuant to its Certified Regulatory Program. California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report or negative declaration once the Secretary of the Resources Agency has certified the regulatory program. SCAQMD's regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110. Pursuant to Rule 110, SCAQMD has prepared this ~~draft~~ Final EA.

CEQA and Rule 110 require that potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the SCAQMD has prepared this ~~draft~~ Final EA to address the potential adverse environmental impacts associated with the proposed project. The ~~draft~~ Final EA is a public disclosure document intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, (b) be used as a tool by decision makers to facilitate decision making on the proposed project.

SCAQMD's review of the proposed project shows that the proposed project would not have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15252, no alternatives or mitigation measures are required to be included in this draft EA. The analysis in Chapter 2 supports the conclusion of no significant adverse environmental impacts.

PROJECT LOCATION

PR 445 would affect commercial facilities and residences located in the four-county South Coast Air Basin (Basin) ~~throughout the SCAQMD's jurisdiction. The SCAQMD has jurisdiction over an area of 10,473 square miles, consisting of the four-county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB).~~ The Basin, which is a subarea of the district, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. ~~The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal non-attainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east~~ (Figure 1-1).

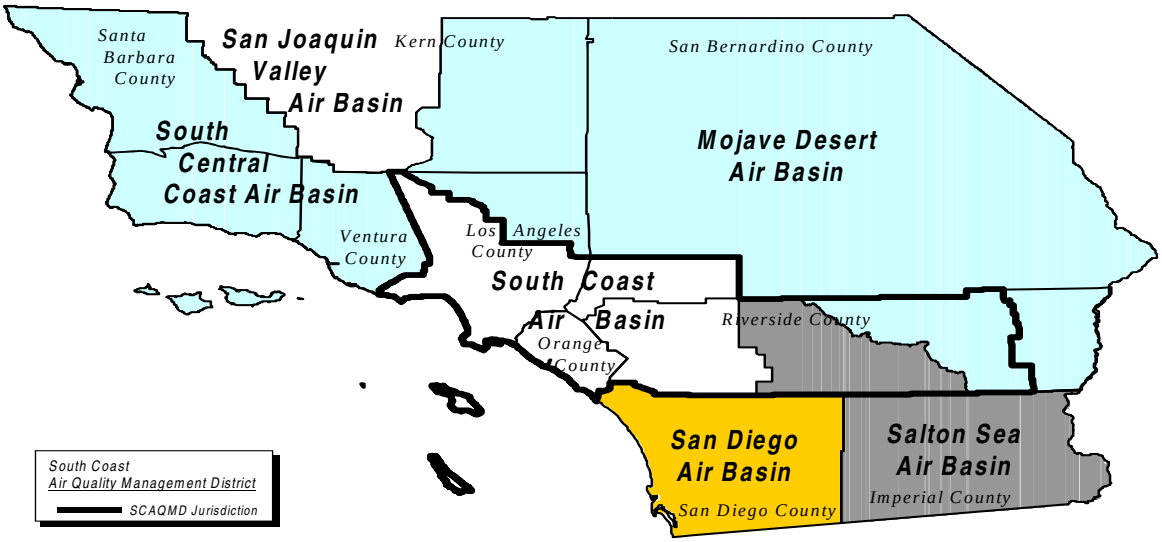


Figure 1-1
Boundaries of the South Coast Air Basin ~~Quality Management District~~

PROJECT OBJECTIVE

The objective of PR 445 is to implement the ~~2003~~ 2007 AQMP control measures BCM-03 ~~MSC-06~~ – Emission Reductions from Wood Burning Fireplaces and Wood Stoves, which has been carried forward into the 2007 AQMP as BCM-03. MSC-06 was originally developed to further reduce PM10 emissions from all affected source categories.

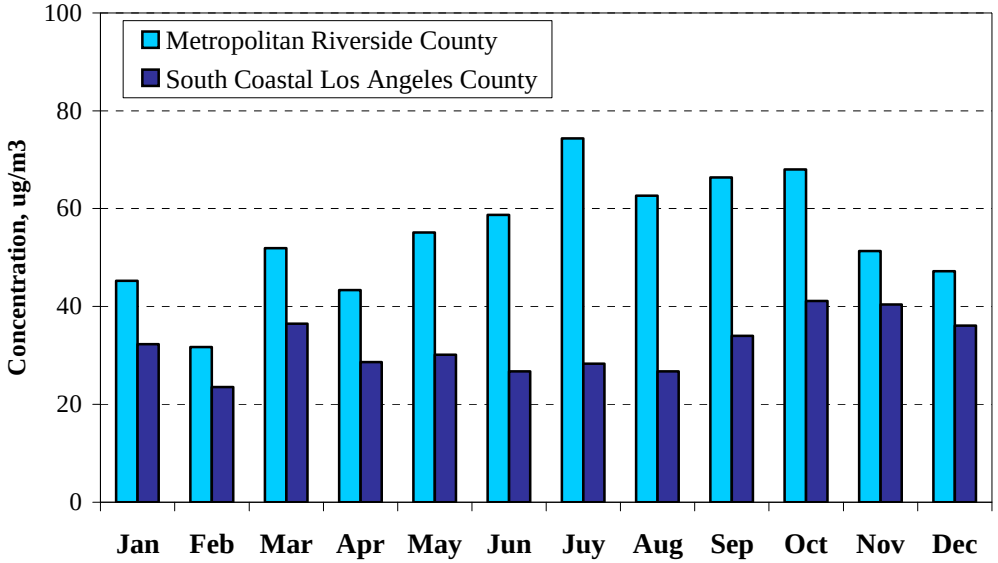
PROJECT BACKGROUND

PR 445 is designed to reduce particulate matter from wood burning devices ~~appliances~~. Particulate matter is typically categorized as total suspended particulate, PM10 and PM2.5. National and state ambient air quality standards have been set for PM10 and PM2.5. The following is a discussion on PM10, PM2.5 and wood smoke that demonstrates the need to promulgate and adopt PR 445.

Wood smoke, like most fuel combustion products, is generally in the fine fraction of PM with most particles having an aerodynamic diameter of 2.5 microns or less. Since the PM2.5 ambient air quality standards are more recent than PM10 ambient air quality standards; older information is often reported only as TSP, PM or PM10 emissions.

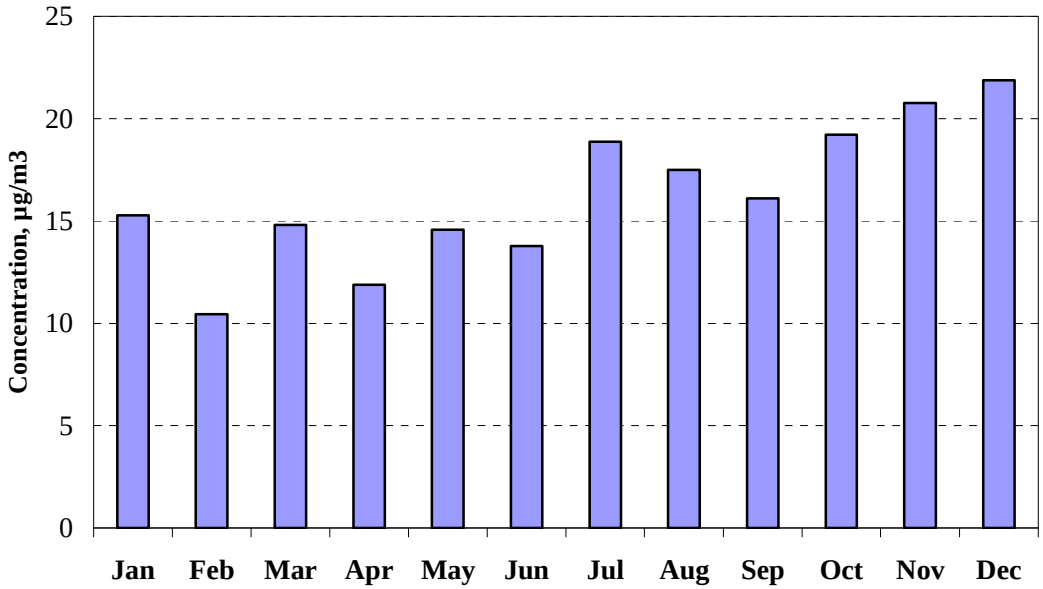
PM2.5 is monitored at various sites throughout the district. Figure 1-2 shows the average PM10 concentrations for each month in the Basin between 2003 and 2005 and Figure 1-3 shows PM2.5 concentrations for 2005.

Figure 1-2
Monthly Average PM10 Concentration, 2003-2005



Source: Figure 2-9 Appendix II, 2007 ~~Draft~~ Final AQMP

Figure 1-3
PM2.5 Seasonal Variation, 2005
Monthly Average Concentration in the Basin, µg/m^3



Source: Figure 2-13 Appendix II, ~~Draft~~ Final 2007 AQMP

~~In addition to emissions inventory information, the magnitude of wood smoke's contribution to ambient PM levels can be estimated through receptor modeling. Receptor modeling is intended to account for specific chemical compounds collected on air sampling filters by matching them against known sources of those chemical compounds. By comparing the collected particulate mass and composition to known source emissions profiles, it is possible to attribute the measured mass to its emissions sources. The term chemical mass balance is commonly used for such calculations. Using these methodologies, a study analyzing 1982 data estimated that wood smoke contributed 9.6, 5.7, 10.8, and 1.3 percent of PM2.5 mass on an average annual basis at Pasadena, Downtown Los Angeles, West Los Angeles, and Rubidoux, respectively[7].~~

~~More recently, the organic compound levoglucosan has been identified as a tracer for wood smoke[8]. Figures 1-4 and 1-5 present the estimated contribution of wood smoke to ambient PM10 levels using the chemical mass balance model[9]. Figure 1-4 presents 1995 data for November and December while Figure 1-5 presents data during the May through November time period. It should be noted that the information presented in Figures 1-4 and 1-5 do not include emissions from paved road dust (largest source category) or secondary PM10 emissions (e.g., ammonium nitrate and sulfate).~~

[7] Schauer, James, et al., Source Apportionment of Airborne Particulate Matter Using Organic Compounds as Tracers, Atmospheric Environment, 1996. Volume 3, No. 22, Pages 3837-3855.

[8] Schauer, James and Cass, Glen, Source Apportionment of Wintertime Gas-Phase and Particle-Phase Air Pollutants Using Organic Compounds as Tracers, Environmental Science and Technology, 2000. Volume 34, Pages 1821-1832.

[9] ARB, Phase II of the Children's Health Study, 2001.

Figure 1-4

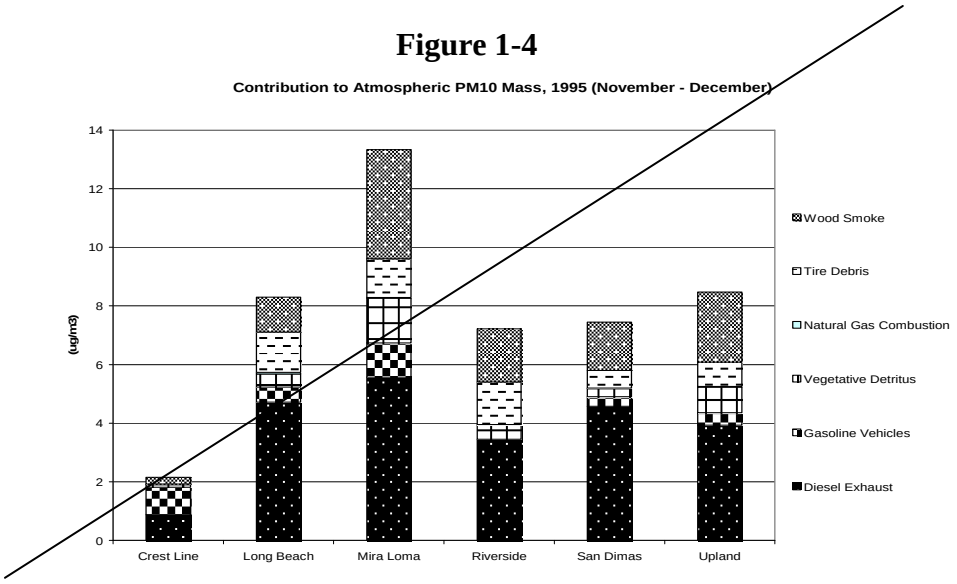
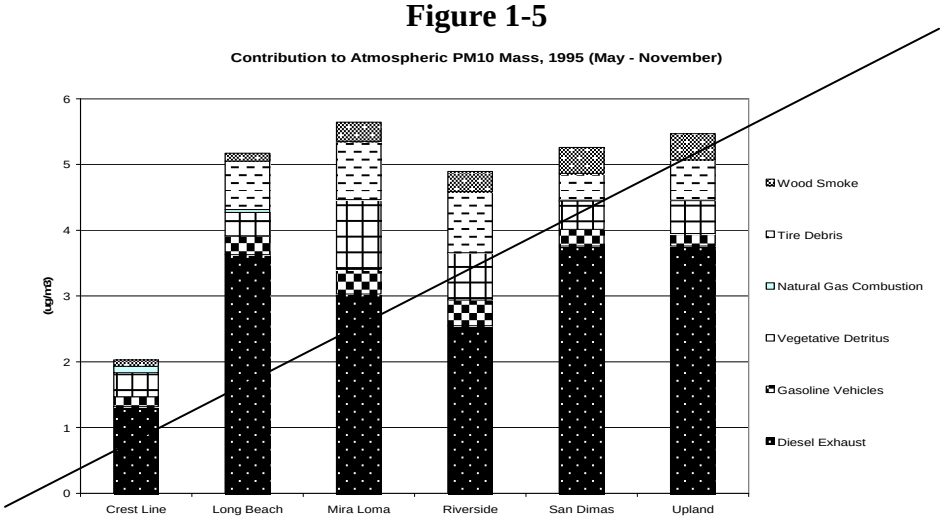


Figure 1-5



~~As illustrated in the Figure 1-4 (winter months), the estimated contribution of wood smoke to ambient PM10 levels ranges from a low of less than one microgram per cubic meter ($\mu g/m^3$) in the mountain community of Crestline to nearly four $\mu g/m^3$ in the community of Mira Loma. This can be compared with diesel exhaust emissions that range from less than one $\mu g/m^3$ in Crestline to approximately six $\mu g/m^3$ in Mira Loma. As would be expected, the data in Figure 1-5 (Spring-Summer months) shows a smaller contribution of wood smoke to ambient PM10 mass (generally less than 0.4 $\mu g/m^3$). A comparison of Figure 1-4 and 1-5 also shows that diesel exhaust emission estimates are generally consistent throughout both evaluation periods.~~

~~Public Complaints~~

~~Another measure of the severity of wood smoke contribution to ambient air quality is public complaints regarding a source. SCAQMD staff evaluates and responds to public complaints 24 hours each day via a toll-free hotline. Based on a review of the SCAQMD's records, public~~

~~complaints are received concerning smoke, but it is difficult to determine the specific number attributable to residential wood burning as most complaints only identify smoke from an unknown source. Residential complaints have especially been received regarding the burning of trash in fireplaces and wood stoves. A review of 2003 to 2006 data indicates 32 complaints where the complainant or SCAQMD staff identified the source as wood burning at a residence[10]. In addition to the formally filed complaints, SCAQMD staff received numerous complaints and observations from the public about wood smoke during public forums such as AQMP workshops and SCAQMD Town Hall meetings.~~

Health Effects from Fine Particulate Matter[11]

A consistent correlation between elevated ambient fine PM (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. In recent years, studies have reported an association between long-term exposure to air pollution dominated by fine PM and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine PM concentration levels have also been related to hospital admissions for acute respiratory conditions, school and kindergarten absences, to a decrease in respiratory function in normal children and increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter.

The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of fine PM.

Health Effects from Wood Smoke

~~Wood smoke is generally in the fraction of fine PM with most particles having an aerodynamic diameter of 2.5 microns or less. ARB's California Emission Inventory Development and Reporting System database[12] estimates that 93.5 percent of the total PM in wood smoke is PM10 and 96.3 percent of the PM10 is PM2.5. Wood smoke is comprised of nitrates, microscopic pieces of fly ash, dust, smoke, and soot as well as polycyclic organic hydrocarbons. Wood smoke is usually released near ground level in populated areas and is especially apt to be breathed by many residents. The health effects of household and neighborhood wood smoke have been studied extensively. The greatest health effect from wood smoke originates from fine particles that can cause health problems ranging from minor irritations such as burning eyes and runny noses to chronic illnesses such as bronchitis. Fine particles also can aggravate chronic heart and lung diseases and are linked to premature deaths in people with these conditions. Persons that may be more susceptible to health effects from wood smoke include those with existing heart or lung disease (congestive heart failure, angina, chronic obstructive pulmonary disease, emphysema or asthma), the elderly, and the young.[13] A literature search of available~~

[10] Caso, Scott, Air Quality Specialist, Engineering and Compliance, South Coast Air Quality Management District, personal communication with Mike Laybourn, May 4, 2006.

[11] Chapter 2, Air Quality and Health Effects, 2007 Draft Air Quality Management Plan, South Coast Air Quality Management District.

~~[12] ARB, CEIDARS (Emissions Inventory) Database, 2006.~~

~~studies[14] also recently concluded that there is no reason to assume that the effects of particulate matter in areas polluted with wood smoke are weaker than elsewhere [e.g., areas with similar ambient PM concentrations not affected by wood smoke]. Conclusions in a more recent health effects study included a statement that there is no persuasive evidence that wood smoke particles are significantly less dangerous for respiratory disease than other major categories of combustion-derived particles in the same size range[15]. The same study did acknowledge, however, that there is too little evidence available to make a judgment concerning the relative toxicity of wood smoke particles with respect to cardiovascular or cancer outcomes.~~

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Overview of Current Regulatory Requirements

SCAQMD monitors ambient air quality for criteria pollutants (ozone, carbon monoxide, PM, lead and sulfate) at 32 locations within the district. Pollutant concentrations exceed federal and/or State standard(s) for suspended particulate matter (AQMP, 2003). In accordance with a court order, EPA issued revised particulate matter standards on September 21, 2006. The new standards, including the revocation of the PM10 annual average standard, took effect 60 days from Federal Register publishing. Under the newly issued PM standards, the prior 24-hour

~~[13] US EPA Fact Sheet, Health Effects of Wood Smoke, http://www.epa.gov/woodstoves/healtheffects.html.~~

~~[14] Boman, Christopher, et al., Adverse Health Effects from Ambient Air Pollution in Relation to Residential Wood Combustion in Modern Society, Scandinavian Journal of Work and Environmental Health, 2003, Volume 29, pages 251-260.~~

~~[15] Naeher, Luck, et all, Woodsmoke Health Effects: A Review, Inhalation Toxicology, 19:67-106, 2007~~

[12] US EPA Fact Sheet, Health Effects of Wood Smoke, http://www.epa.gov/woodstoves/healtheffects.html

[13] Boman, Christopher, et al., Adverse Health Effects from Ambient Air Pollution in Relation to Residential Wood Combustion in Modern Society, Scandinavian Journal of Work and Environmental Health, 2003, Volume 29, pages 251-260.

[14] Naeher, Luck, et all, Woodsmoke Health Effects: A Review, Inhalation Toxicology, 19:67-106, 2007.

PM10 standard has been retained at 150 $\mu g/m^3$ as with the PM2.5 annual average standard at 15 $\mu g/m^3$ has been retained. The prior 24-hour PM2.5 standard was, however, reduced from 65 to 35 $\mu g/m^3$.

The federal 24-hour standard was not exceeded at any of the district locations monitored in 2005. Although final designations have not been made by EPA, data suggest that the Basin will be classified as non-attainment under the newly issued PM2.5 standards and the Coachella Valley will be designated as unclassifiable. Both the Basin and the Coachella Valley are classified as non-attainment for the State PM10 standard (50 $\mu g/m^3$ on a 24-hour basis and 20 $\mu g/m^3$ for the annual average). The Basin is also classified as non-attainment for the State PM2.5 annual average standard (12 $\mu g/m^3$), while the Coachella Valley is designated as unclassified.

SCAQMD Requirements

Prior to the 2003 AQMP, SCAQMD staff had not proposed a control measure to reduce emissions from wood burning devices ~~appliances~~, which include fireplaces, fireplace inserts, and wood burning stoves. EPA has, however, previously adopted performance standards for new wood heaters (wood stoves and fireplace inserts) sold since 1992.[15] Currently, there are no federal certification requirements for traditional fireplaces that have an air-to-fuel ratio in excess of 35:1, because a suitable test method has not been developed. An ASTM Fireplace Task Group has developed an emissions and measurement draft protocol which may be used by EPA and/or individual states to set emission thresholds for traditional fireplaces, however, these efforts are ongoing[16].

State Requirements

In 1989, the ARB adopted a suggested control measure (SCM) for emissions from wood burning devices ~~appliances~~. A summary of the most promising potential control actions from ARB's SCM include the following:

> Voluntary Curtailment Program: This program encourages the public to refrain from use of wood heaters and fireplaces when air quality is expected to be poor.
>
> Public Awareness Programs: The goal is to inform the public about the proper operation and maintenance of wood heaters and health effects of wood smoke.
>
> Replacement of Existing Wood Heaters: Upon the sale of real property that contains a wood heater, the heater must be clean burning as reflected by an EPA-certified, Oregon-certified, or pellet-fueled wood heater.
>
> Moisture Content of Seasoned Wood: Dry wood burns more efficiently; therefore, firewood that is offered for sale as "seasoned wood" must have a moisture content of 20 percent by weight or less.

[15] 4.1 grams PM per hour for catalytic heaters and 7.5 grams per hour for non-catalytic heaters

[16] Stegmeir, Paul, ASTM Fireplace Test Protocol Update, An Article Prepared for the Hearth & Home, March 2006

Prohibited Fuel Types: Garbage, treated wood, plastic, rubber, waste petroleum products, paints and paint solvents, and coal having a sulfur content exceeding more than one percent by weight are prohibited from being burned in a wood-burning device ~~appliance~~.

Many California air districts have developed programs/regulations to reduce emissions from wood burning devices ~~appliances~~ including the Bay Area Air Quality Management District, the San Joaquin Valley Unified Air Pollution Control District and the Sacramento Metropolitan Air Quality Management District.

Federal Requirements

US EPA adopted New Source Performance Standards (NSPS) for New Residential Wood Heaters (40 CFR 60, Subpart AAA). The NSPS requires that wood burning heaters manufactured after 1990 meet emission standards of 4.1 grams PM per hour for catalytic heaters and 7.5 grams per hour for non-catalytic heaters.

In addition to the NSPS for wood burning stoves and inserts, a variety of programs have been initiated to assist in the removal of older wood burning technologies and replacement with cleaner technologies. Specifically, EPA has initiated the Great American Woodstove Change-Out program to assist local agencies in developing and implementing programs intended to reduce emissions from wood stoves. Under the program agencies have provided financial incentives for the replacement of non-certified wood stoves with U.S. EPA Phase II-certified devices ~~appliances~~. The Energy Policy Act, approved on August 8, 2005, also establishes a rebate program for the purchase of renewable/biomass energy-fueled devices ~~appliances~~ with an efficiency of at least 75 percent (Title II, subtitle A, Section 106), however, funding and implementation mechanisms must be resolved.

PROJECT DESCRIPTION

The following summarizes requirements ~~and advisory provisions~~ of the proposed rule. A copy of PR 445 is included in Appendix A.

Purpose and Applicability

The purpose of PR 445 is to reduce PM emissions from wood burning devices ~~appliances~~. Rule 445 applies to any person who manufactures, sells, offers for sale, ~~operates a permanently~~ installs~~ed~~, a~~indoor or outdoor~~ wood burning deviceappliance ~~or portable outdoor wood burning appliance~~; any ~~person who~~ commercial firewood facility that sells, offers for sale, or supplies wood for a wood burning ~~appliance~~ device or portable outdoor wood burning device; and any land owner or land occupier that operates a wood burning device or portable outdoor wood burning device during a mandatory curtailment ~~person that installs a wood burning appliance within the district~~.

Definitions of Terms

This subdivision lists keywords related to wood burning devices ~~appliances~~ and defines them for clarity and enhanced enforceability. For example, a commercial firewood facility is any operation that sells, or offers for sale, bulk firewood.

Requirements

- No person shall install a permanently installed wood burning device into any new development, which begins construction on or after six months from the date of rule adoption.
- Effective six months after the date of adoption, no person shall sell, offer for sale, supply, or install a new or used permanently installed indoor or outdoor wood burning device ~~appliance~~ or gaseous-fueled device unless it meets one of the following:
  - EPA Phase II-Certified wood burning heater;
  - Pellet-fueled wood burning heater;
  - Masonry heater; or
  - Wood burning device or fireplace determined to meet US EPA Phase II-Certified wood burning heater standards particulate matter emission standard established by Title 40 Code of Federal Regulations, Part 60, Subpart AAA, February 28, 2988 or subsequent revisions; or
  - A dedicated gaseous-fueled fireplace.
- ~~No person shall advertise, sell or offer for sale a housing unit with more than one wood burning appliance that meets one of the above criteria in new developments and remodels constructed after January 1, 2008.~~
- ~~No person shall advertise, sell or offer for sale, supply, install or transfer a used wood burning appliance unless it meets one of the above criteria for new wood burning appliance.~~
- ~~No person shall install or operate any wood burning appliance unless in accordance with the manufacturers specifications.~~
- ~~No person shall advertise, sell or offer to sell, supply, or transfer any wood advertised, described or in any way represented to be seasoned unless the wood has a moisture content of 20 percent or less.~~ A commercial firewood facility shall only sell seasoned wood (i.e., less than or equal to 20 percent moisture content) from July 1 through the end of February the following year. Any commercial firewood facility may sell seasoned as well as non-seasoned wood during the remaining months.
- No person shall burn any product not intended for used as fuel in a wood burning device including, but not limited to, ~~cause or allow any of the following materials to be burned:~~ garbage, treated wood, particle board, plastic products, rubber products, waste petroleum products, paints, coatings, solvents, or coal~~, or any other product not intended by the manufacturer for use as fuel in a wood burning appliance~~.
- ~~Beginning January 1, 2010, no commercial operation shall operate a wood burning appliance unless it meets one of the following:~~
  - ~~EPA Phase II-Certified wood burning heater;~~
  - ~~Pellet-fueled wood burning heater;~~
  - ~~Masonry heater; or~~
  - ~~Wood burning fireplace determined to meet US EPA Phase II-Certification standards.~~
- Effective beginning November 1, 2013 ~~six months after the date of adoption~~, no person shall operate an indoor or outdoor wood burning device ~~would be prohibited~~ when a ~~"no burn day"~~ mandatory wood burning curtailment day is forecast for their specific region within the South Coast Air Basin~~under District Rule 444~~.
- ~~Beginning January 1, 2012, no person shall sell or transfer real property with a wood burning heaters in areas with PM2.5 levels greater than 20 µg/m^3 without assuring that each is:~~
  - ~~EPA Phase II-Certified;~~

~~o Pellet-fueled; or~~
~~o Rendered inoperable.~~

- ~~Public Awareness Information~~
  - ~~o Six months after rule adoption, wood burning appliance retailers must provide the following public awareness information at the point of sale:~~
    - ~~Proper installation, operation and maintenance in accordance with manufacturer specifications;~~
    - ~~Proper fuel selection and use;~~
  - ~~o Six months after rule adoption, wood burning appliance retailers and commercial firewood facilities must provide information as prepared by the Executive Officer~~
    - ~~Wood burning curtailments; and~~
    - ~~Health effects of wood smoke~~

Exemptions

- The rule shall not apply to cookstoves.~~:~~

~~o Any gaseous-fueled residential appliance,~~
~~o Cookstoves, or~~
~~o Wood burning heaters operated above 3,000 mean sea level would not be subject to the wood burning day prohibitions.~~
~~o The sell or transfer any real property provisions would not apply to properties that are registered as a historical site or are contributing structures located in a historic preservation overlay zone as determined by the applicable, federal, state, or local agency~~

- Paragraph (d)(1) shall not apply to new developments where there is no existing infrastructure for natural gas service within 150 feet of the property line or those 3,000 or more feet above mean sea level are exempt from the new development requirement.
- Paragraph (d)(2) shall not apply to indoor or outdoor wood burning devices that are permanently installed and included in the sale or transfer of any existing development is exempt from requirements pertaining to sell, offer for sale, supply or install new or used permanently installed indoor or outdoor wood burning device or gaseous-fueled device.
- The Provisions of (d)(2) shall not apply to properties that are registered as a historical site, or are contributing structures located in a Historic Preservation Overlay Zone, as determined by the applicable, federal, State, or local agency. Contributing structures are those buildings which are examples of the predominate styles of the area, built during the time period when the bulk of the structures were built in the Historic Preservation Overlay Zone
- Manufactured gas logs are exempt from the fuel restrictions for wood burning devices in paragraph (d)(3).
- The curtailment program requirements of subdivision (e) shall not apply to:
  - o Residential or commercial properties where a wood burning device is the sole source of heat;
  - o Low income households;
  - o Residential or commercial properties where there is not exiting infrastructure for natural gas service within 150 feet of the property line; pr
  - o Residential or commercial properties located 3,000 or more feet above mean sea level; or
  - o Ceremonial fires exempted under Rule 444-Open Burning.

Administrative Requirements

The Executive Officer would provide public notice of a mandatory wood burning curtailment through all the following methods:

- A recorded telephone message;
- Messages posted on the SCAQMD web site, www.aqmd.gov;
- Electronic mail messages to persons or entities that have requested electronic notification;
- Notifying broadcast and print media operating within the boundaries of the Basin;
- Any additional method that the Executive Officer determines appropriate.

Penalties

Any person that violates the curtailment provision is subject to the following:

- First time violators during each wood burning season would be required to attend a wood smoke awareness course that has been approved by the Executive Officer or pay a penalty of $50.
- Second time violators during each wood burning season would be required to pay a penalty of $150 or submission of proof of installation of a dedicated gaseous-fueled fireplace within 90 days after receiving a notice of violation; and
- Third time violators during each wood burning season or violators of other provisions of PR 445 would be required to pay a penalty of $500 or implement an environmental beneficial project as derived through the mutual settlement process.

EMISSIONS INVENTORY

The emissions inventory was developed in the Staff Report[17] for PR 445 and reproduced here for completeness. Emissions from residential wood burning devices are caused primarily by incomplete combustion and include PM, CO, NOx, SOx, and VOC. Studies have shown that PM emissions, the pollutant of concern related to PR 445, are generally in the accumulation (less than or equal to 2.5 microns) size range[18]. Additionally, incomplete combustion of wood produces polycyclic organic matter, a group of compounds classified as hazardous air pollutants under Title III of the federal Clean Air Act.

Existing ARB Emissions Inventory for the District

Table 1-1 presents year 2002 annual average emissions from wood stoves and fireplaces in the district[19]. All emissions are reported in terms of tons per annual average day. ARB data also estimate the 2002 PM2.5 winter inventory for wood stove and fireplace emissions at 10.6 tons PM2.5 per day.[20]

[17] Preliminary Draft Staff Report Proposed Rule 445 – Wood Burning Appliances, January 2007.

[18] Jacob, D., et al, Fine Particle and Gaseous Emissions Rates from Residential Wood Combustion, Environmental Science and Technology, 2000. Volume 34, Pages 2080-2091.

[19] ARB, CEIDARS (Emissions Inventory) Database, 2006.

[20] www.arb.ca.gov/app/emsinv/ccos/fcemssumcat_cc212.php

Table 1-1
2002 Annual Average Emissions from Residential Wood Combustion (tons/day)

Equipment Description	CES/EIC Codes	NOx	VOC	CO	SOx	Total PM	PM10 fraction of Total PM	PM2.5 fraction of Total PM
Wood Combustion - Wood Stoves	610-600-0230-0000	0.2	1.05	14.34	0.03	2.40	2.25	2.17
Wood Combustion – Fireplaces	610-602-0230-0000	0.31	1.6	29.78	0.05	4.08	3.81	3.67
Total		**0.51**	**2.65**	**44.12**	**0.08**	**6.48**	**6.06**	**5.84**

The ARB emissions inventory was developed based on an estimated number of wood-burning units and amount of wood burned per household by county multiplied by EPA's AP-42 emission factors. As indicated in the following subsection, SCAQMD staff, in cooperation with ARB and other stakeholders, has been reevaluating the emissions inventory in conjunction with current rule development efforts.

During the rule making process it was determined that the ARB emission inventory was the most appropriate emission inventory. The ARB emission inventory was used in the 2007 AQMP and by other air districts to establish their emission inventories for wood burning. Table 2-1 presents the ARB's wood burning emissions inventory for the years 2008 and 2014 in the Basin.

Table 1-2
2008 and 2014 ARB Annual Average Criteria Emissions in the Basin from Residential Wood Combustion (ton/day)

Pollutant	2008*	2014
PM10	6.35	6.71
NOX	0.53	0.56
PM2.5	6.11	6.46
SOX	0.08	0.08
ROG	2.77	2.92
CO	46.48	49.34

2008 emissions inventory interpolated from the 2002 and 2014 ARB emissions inventory.

~~**Updated Emissions Inventory**~~

~~Air pollution emissions from wood burning are determined by the number of sources, multiplied by the amount of fuel per source, multiplied by an emission factor. Emissions from wood burning appliances are highly variable, depending on the amount and type of wood burned and the types of appliances being used for burning wood. Wood burning appliance installation and wood burning practices also influence emissions. In order to estimate emissions from this source~~

category, many assumptions are necessary, to be made with the understanding that any variations in one or more of these variables will substantially change the calculations. With the support of the Hearth, Patio, and Barbeque Association (HBPA), a revised wood burning appliance emission inventory report[21] (referred to as the OMNI report) was developed for both the Basin and the Coachella Valley portion of the Salton Sea Air Basin.

Assumptions used to update the inventory were based, to the extent feasible, on local data and are included in Appendix B. For example, the American Housing Survey (AHS), conducted by the U.S. Census Department, compiles data on the number and type of wood burning appliances for Los Angeles, Santa Ana, and Riverside/San Bernardino areas based on statistical sampling within each area. The information in Table 1-2 presents a summary of 2002 AHS data, or interpolated data, for the Basin that includes the estimated number of households with useable fireplaces, households (separated by appliance type) using wood for primary heat, and households (separated by appliance type) using wood burning as a supplemental heating source. As illustrated in Table 1-2, there are many households with useable fireplaces, but a very small portion (less than one percent) are used as a primary heat source. Households with a usable fireplace do not use them as the main heating source. Instead, these fireplaces are used primarily for aesthetic purposes. AHS data are not additive as respondents could indicate that a stove or a fireplace is considered "main heating equipment" and "other heating equipment".

Table 1-2
American Housing Survey Information

		Main Heating Equipment			Other Heating Equipment[1]		
Metropolitan Area	**Useable Fireplaces**	**Stoves**	**Fireplace with Inserts**	**Fireplaces (no inserts)**	**Stoves**	**Fireplaces with Insert**	**Fireplaces (no inserts)**
Los Angeles-Long Beach	1,121,450	925	5,850	2,275	17,525	71,750	174,225
Anaheim-Santa Ana	531,600	<50	<50	800	2,400	32,100	54,100
Riverside San Bernardino	573,800	6,500	1,800	3,700	18,200	65,300	84,400
Total	**2,226,850**	**7,475**	**7,700**	**6,775**	**38,125**	**169,150**	**312,725**

[1] Supplemental heating source

With information from the AHS report as a first start, the OMNI report used assumptions based on regional and national surveys to estimate the number of wood burning appliances within various wood burning appliance categories (Table 1-3).Wood burned by appliance type was then estimated and the mass of wood was multiplied by the appropriate emission factor to estimate annual average emissions. Table 1-4 presents the annual average daily emissions estimate for wood burning appliances included in the OMNI report.

[21] OMNI Environmental, Residential Wood Combustion Emissions Inventory South Coast Air Basin and Coachella Valley Portion of the Salton Sea Air Basin 2002 Base Year, October 2006

With the high number of households with usable fireplaces in southern California, a key component used to estimate emissions is the average wood consumption per unit. ARB has developed a default statewide wood burning estimate of 0.28 cord per household and an estimate that a cord of wood weighs approximately two tons[22]. For reference, a cord of wood is measured by volume as four feet wide by four in height, by eight feet in length. A review of wood seller survey information indicates that the average weight of a cord of wood in southern California is approximately 3,081 pounds or 1,400 kilograms[23]. Emission inventory guidance encourages the use of local survey data when available.

Table 1-3
Estimates of Appliances by Appliance Type

	South Coast Air Basin		Coachella Valley	
Appliance Type	**Number Owned**	**Number Used**	**Number Owned**	**Number Used**
Conventional pre-EPA certification wood heaters	161,260	148,008	7,425	6,702
EPA-certified non-catalytic wood heaters	34,341	33,107	1,590	1,499
EPA certified catalytic wood heaters	14,134	13,632	649	615
Pellet Heaters	9,490	9,278	497	479
Fireplaces without inserts	1,673,684	1,221,721	45,530	33,237
Total	1,892,909	1,426,746	55,691	42,532

Table 1-4
2002 PM2.5 Emissions Inventory for Basin and Coachella Valley

Appliance Type	**Basin PM2.5 (tons/day)**	**Coachella Valley PM2.5 (tons/day)**
Conventional pre-EPA certification wood heaters	9.07	0.43
EPA certified non-catalytic wood heaters	0.65	0.03
EPA certified catalytic wood heaters	0.32	0.02
Pellet heaters	0.03	<0.01
Fireplaces without inserts (wax/fiber logs included)	9.85	0.19
Total	19.92	0.68

[22] ARB (California Air Resources Board), Area Source Methodology, Section 7.1, Residential Wood Combustion, July 1997.

[23] Sierra Research, Inc., Residential Wood Use in California, report prepared for the U.S. Environmental Protection Agency, EPA Contract No. 68-02-4601, October 20, 1989.

~~To develop a more accurate emission inventory using local data, the following methodology was used. Using the average weight of a cord of wood in southern California and data from available survey information, the OMNI report estimated that wood burning heaters used as the primary source of heat burned an average of 0.95 to one cord (approximately 3,000 pounds) per year. For fireplaces without inserts two independent methods to estimate the amount of wood burned for heating and wood burned for aesthetic use were developed by OMNI. One method estimated the number and duration of fires and the other included a weighted average to estimate cords burned per year for supplemental heating and aesthetic use. The first method (based on number and duration of fires) estimated typical annual wood usage per household for supplemental heating and aesthetics at 0.22 cord or approximately 678 pounds. The second method (weighted average) was based on estimates of the average cords burned in fireplaces without inserts for heating (0.656 cord or approximately 2,000 pounds) and average cords burned for aesthetics (0.069 cord or approximately 213 pounds)[24]. This resulted in an estimate that the average cords burned per household per year, weighted for relative heating and aesthetic use, was 0.17 cord (523 pounds).~~

~~In order to provide a range of emissions estimates, variations in the wood burned per household assumptions were applied to the base information included in the OMNI report. Specifically, the amount of wood burned in wood burning heaters used for primary heating was reduced from approximately 3,000 to 2,000 pounds based on data from the referenced report[10]. Similarly, the amount of wood burned for supplemental heating and aesthetics was reduced from 0.22 cord or approximately 678 pounds to 0.069 cords or approximately 213 pounds from the referenced report[10]. Applying these average wood burning estimates to the number of wood burning appliances developed in the OMNI report results in the adjusted emission inventory presented in Table 1-5. It should be noted that the adjusted emission inventory presented in Table 1-5 does not alter the emission estimates for pellet stoves or wax/fiber logs where it is believed that better data were available.~~

~~Reducing the estimate of the average amount of wood burned per household for primary heating supplemental heating, and aesthetic use, especially for the southern California area, appears appropriate and is consistent with available survey information indicating that household representatives tend to overestimate when asked about the amount of wood burned each year[25].~~

~~Based on this information, the annual average daily emissions from wood burning appliances is estimated to range from approximately ten to 20 tons per annual average day for the Basin and 0.41 to 0.68 ton per annual average day for the Coachella Valley portion of the Salton Sea Air Basin. It is acknowledged that the total annual wood burning emissions will increase during periods of cooler weather (generally November through February). For example, applying the total annual average wood burning emissions estimate of ten tons per day to the winter months identified above would result in an estimate of approximately 30 tons of PM2.5 per winter day.~~

[24] Houck J.E., et al, A Recommended Procedure for Compiling Emission Inventory for National, Regional, and County Activity Data for the Residential Wood Combustion Source Category, proceedings U.S. Environmental Protection Agency Emission Inventory Conference, Denver, CO, 2001

[25] ibid., Sierra Research, 1989

~~Table 1-5~~
~~Adjusted 2002 PM2.5 Emissions Inventory for Basin and Coachella Valley to Account for Lower Wood Burning Estimates~~

~~Appliance Type~~	~~Basin PM2.5 (tons/day)~~	~~Coachella Valley PM2.5 (tons/day)~~
~~Conventional pre-EPA certification wood heaters~~	~~6.26~~	~~0.30~~
~~EPA certified non-catalytic wood heaters~~	~~0.45~~	~~0.02~~
~~EPA certified catalytic wood heaters~~	~~0.22~~	~~0.01~~
~~Pellet heaters~~	~~0.03~~	~~<0.01~~
~~Fireplaces without inserts (wax/fiber logs included)~~	~~3.13~~	~~0.08~~
~~**Total**~~	~~10.1~~	~~0.41~~

CHAPTER 2 - ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Environmental Checklist and Discussion

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's potential adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Proposed Rule 445 – Wood Burning ~~Appliances~~ Devices
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive Diamond Bar, CA 91765
CEQA Contact Person:	Mr. James Koizumi (909) 396-3234
Rule 445 Contact Person	Mr. Michael Laybourn (909) 396-3066
Project Sponsor's Name:	South Coast Air Quality Management District
Project Sponsor's Address:	21865 Copley Drive Diamond Bar, CA 91765
General Plan Designation:	Not applicable
Zoning:	Not applicable
Description of Project:	PR 445 would implement ~~2003~~ 2007 AQMP Control Measure BCM-03 - ~~MSC-06~~ Emission Reductions from Wood Burning Fireplaces and Woodstoves. The implementation of PR 445 is expected to reduce PM10 emissions by 2,029 ~~11,301~~ pounds per day of which 1,964 ~~10,883~~ pounds per day are PM2.5 emissions.
Surrounding Land Uses and Setting:	Not applicable
Other Public Agencies Whose Approval is Required:	Not applicable

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐ Aesthetics	☐ Agriculture Resources	☑ Air Quality
☐ Biological Resources	☐ Cultural Resources	☑ Energy
☐ Geology/Soils	☑ Hazards & Hazardous Materials	☐ Hydrology/ Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☑ Solid/Hazardous Waste	☐ Transportation/ Traffic	☑ Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

☑ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, COULD NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, 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 ASSESSMENT 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 ASSESSMENT pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL ASSESSMENT, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: February 5, 2007 **Signature:** Steve Smith

Steve Smith, Ph.D.
Program Supervisor

ENVIRONMENTAL CHECKLIST AND DISCUSSION

As discussed in Chapter 1, the main focus of the proposed rule is to reduce PM emissions from ~~the~~ wood burning ~~appliances~~ devices. PR 445 contains requirements for new or replacement equipment at new or existing facilities. ~~The Staff Report estimates that proximately 5,213 new wood-burning appliances are installed per year.~~ Under PR 445, new wood burning appliances would need to be clean technology. Wood burning devices would not be allowed in any new development six months from date of adoption. ~~Staff has estimated that 250 pre-EPA certified wood heaters at commercial facilities would be required to be replaced with EPA-certified wood heaters, a pellet stove, or a natural gas device during the 2007 to 2010 time period. Staff expects that replacement devices would be prefabricated units that would not require the use of heavy construction equipment to install.~~

Construction

New Construction

PR 445 would not generate any new construction. In new development PR 445 would only restrict installation of wood burning devices. Except as provided for in the exemptions, wood burning devices would be prohibited devices in new development. ~~PR 445 would affect any new construction that would include wood burning devices or alternatives to wood burning devices. In new construction, PR 445 would only restrict the type of wood burning or alternative devices installed. PR 445 would require that any new wood burning appliances be clean technologies, such as a US-EPA Phase II-Certified wood burning heater, a masonry heater, a wood burning appliance or fireplace that to meets the US-EPA PM emission standard established by Title 40 CFR, Part 60, Subpart AAA, and approved in writing by the Executive Officer. Project proponents for new construction may also opt to install non-wood fueled appliances such as natural gas or electric which are not a required compliance options, but would not be prohibited by PR 445.~~

Existing PR 445 non-compliant wood burning or and PR 445 compliant ~~wood burning or~~ alternative fueled devices ~~appliances~~ are prefabricated and dropped into place at new or existing facilities without the use of heavy construction equipment. Both compliant and non-compliant ~~wood burning~~ equipment would require the construction of a footing or housing for the equipment, the installation of the wood burning devices, and construction of a ventilation/exhaust system. Therefore, any alternative device would generate at the most the same construction emissions as existing PR 445 non-compliant wood burning devices.

~~N~~In fact, natural gas and electric devices may require less construction equipment or time to construct. Natural gas venting systems are similar to hot water heaters and typically do not need to be as large as a flue or to be vented high off the roof as wood burning stacks. Electric devices do not need venting systems at all. However, for the purposed of the analysis contained herein, the construction of existing non-compliant wood burning devices and compliant ~~wood burning or~~ alternative devices is expected to be similar. Therefore, PR 445 would generate no new construction emissions from new development requirements.

Existing Facilities

PR 445 would prohibit the installation of permanent non-compliant indoor or outdoor wood burning devices in existing structures (e.g., during remodeling). PR 445 compliant devices for

existing structures include: EPA Phase II-Certified wood burning heaters, a pellet-fueled wood burning heater, masonry heater, or wood burning devices or fireplace that meets EPA particulate matter emission standards established by Title 40 CFR, Part 60, Subpart AAA, or dedicated gaseous-fueled fireplace. ~~PR 445 would require either the operation of compliant wood burning devices, alternatives to wood burning devices or the operator to render non-compliant wood burning devices inoperable; therefore, all construction related to removing, installing or rendering appliances inoperable would be new impacts attributed to complying with PR 445.~~

~~At existing commercial facilities or affected property transferred, non-compliant equipment would be required to be made inoperable or replaced. Equipment would be made inoperable by removing key components or permanently sealing entrances for wood fuel sources or sealing exhaust systems. Both~~ eExisting ~~PR 445~~ non-compliant and PR 445 compliant wood burning or alternative appliances are prefabricated and can be removed or dropped into place at new or existing facilities without the use of heavy construction equipment.

Typically the prefabricated wood burning appliance and ventilation/exhaust system can be installed within the wood burning system housing. It is expected that any removal or installation of wood burning or alternative appliances would occur within existing facilities without the need for heavy construction equipment.

Most residences have natural gas utilities (91.5 to 95.8 percent). Residences that do not have natural gas utilities and that choose natural gas appliances would need to install a natural gas line from a natural gas main line. The installation of a natural gas line is not expected to require heavy construction equipment and is therefore expected to be de minimus. If a natural gas main line is not readily available, it is assumed that one would not be placed into an area because of PR 445. Most areas within the district have access to natural gas main lines. Areas that do not have natural gas lines are usually limited to higher elevations. In such cases, it is believed that residences would either use wood, propane or electric devices.

PR 445 is not expected to require the installation of propane storage vessels and related piping. It is expected that operators that choose to install propane fueled appliances in lieu of wood burning appliances would do so because other propane devices (stoves, heaters, washers, dryers, etc.) were already in use or planned. Otherwise, it is assumed that operators would use the same source of fuel or electricity used by other existing or planned devices.

It was assumed that removing, installing or rendering appliances inoperable would require up to two diesel truck and two gasoline truck round trips at each facility ~~or property transferred~~. A round trip for one diesel fueled delivery/haul truck and one gasoline fueled worker vehicle would be required to remove the existing appliances and potentially parts of the existing ventilation/exhaust systems. A diesel truck round trip and gasoline fueled worker truck round trip would also be required to deliver the replacement appliances and ventilation/exhaust systems. There may be potentially fewer round trips if the same trucks can be used to deliver the new appliance system and haul away the existing appliance system. For operators that would not operate a replacement system, only a single round trip for both the haul truck and worker gasoline fueled truck may be necessary to remove or render an existing appliance inoperable.

Construction related to PR 445 is expected to affect wood burning appliance systems located within the boundaries of new and existing facilities ~~or properties transferred~~, which are typically located in areas that have already been greatly disturbed.

~~Commercial facilities would be required to operate PR 445 compliant appliances by 2010. Staff estimates that there are 250 pre-EPA certified appliances in the district at commercial facilities. Therefore all 250 pre-EPA certified appliances would need to be replaced by 2010 or made inoperable by 2010.~~

~~Beginning in 2012, any person transferring any real property in areas where PM2.5 levels are above 20 micrograms per cubic meter would need to assure that each wood burning heater is PR 445 compliant or rendered permanently inoperable. Frequency of property transfers was based on a Chicago Title Company database that identified an average turnover of property ownership to be 10.5 years. The Staff Report estimates that there are 27,414 conventional pre-EPA certified wood heaters located in Riverside and San Bernardino Counties. Assuming an annual average of 10 percent household sells, 2,741 households would be subject to the change out provisions annually. Staff has estimated that 20 percent of the households would make non-compliant wood burning heaters inoperative and 80 percent would replace non-compliant heaters with compliant or alternative heaters. Therefore, 3,064 households would make non-compliant wood burning heaters inoperative and 27,414 households would replace non-compliant wood burning heaters.~~

~~Since commercial facilities are required to operate PR 445 compliant wood burning appliances by 2010 and the residential real property transfer requirement would not apply until 2012, the construction at commercial and residential units would not temporally overlap.~~

Operations

Emission reductions associated with compliant wood burning or alternative fueled devices ~~appliances~~ are presented in Chapter 1. The operations of compliant wood burning devices would result in reductions in all criteria and toxic emissions.

PR 445 compliant devices ~~appliances~~ and alternative devices ~~appliances~~ control emissions by using fuel more efficiently or using alternative fuels or electricity. By using fuel more efficiently and in some cases burning cleaner fuels or electricity, operation and maintenance are often easier. More efficient combustion means less soot and combustion products to foul the ventilation/exhaust system. Alternative appliances such as natural gas and electricity are relatively maintenance-free compared to the removal of ash from wood burning devices and ventilation/exhaust system cleaning (chimney sweeping). Compliant wood burning appliances would generate less soot than non-compliant wood burning devices. Therefore, even the maintenance of compliant wood burning devices ~~appliances~~ is expected to be less than for non-compliant wood burning devices.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:			
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑

Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Discussion

I.a), b), c) & d) PR 445 would reduce particulate matter from wood burning appliances. The primary method of compliance would be to restrict the sale, supply, installation or transfer of new wood burning appliances, materials burned in a wood burning appliance, and commercial operations of certain wood burning appliances.

~~PR 445 would not require any new development, but may require minor modifications to buildings or other structures for compliant wood burning appliances or wood burning appliance alternatives (such as natural gas appliances) to comply with the proposed rule. PR 445 may require replacing existing equipment or altering proposed appliances or fuels.~~ PR 445 would prohibit the installation of wood burning devices in new development. In new development, the installation or alternative devices is not expected to change the visual character of the environment.

PR 445 would restrict the type of permanently installed indoor or outdoor wood burning device at existing structures that can be installed, such as EPA Phase II-Certified wood burning heaters, a pellet-fueled wood burning heater, masonry heater, or wood burning devices or fireplace that meets EPA particulate matter emission standards established by Title 40 CFR, Part 60, Subpart

AAA, or dedicated gaseous-fueled fireplace. The PR 445 compliant devices are not expected to be substantially visually different than non-compliant wood burning devices. Therefore, this requirement is not expected to affect the visual character of the environment. In addition, PR 445 does not require remodeling of existing facilities or residences.

~~Staff estimates that 250 commercial facilities may retrofit or replace pre-EPA certified wood appliances. There are approximately 27,414 conventional pre-EPA certified residential heaters. Since the replaced wood appliances/heaters would be located within the boundaries of existing commercial facilities or residences and would not be substantially different in physical appearance~~ Since PR 445 would not require any development and PR 445 compliant devices are not expected to be visually substantially different than non-compliant devices, it is not expected that ~~the replacement appliances/heaters~~ PR 445 would obstruct scenic resources or degrade the existing visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings.

Additional light or glare would not be created which would adversely affect day or nighttime views in the area since no light generating equipment would be required to comply with proposed rule.

Based upon these considerations, significant adverse aesthetics impacts are not anticipated and will not be further analyzed in this Draft EA. Since no significant aesthetics impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
II.	**AGRICULTURE RESOURCES.** 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?	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☑

Significance Criteria

Project-related impacts on agricultural resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

II.a), b), & c) PR 445 would reduce particulate matter from wood burning appliances. The primary method of compliance would be to restrict the sale, supply, installation or transfer of use or new wood burning devices ~~appliances~~, materials burned in a wood burning devices ~~appliances~~, and operations of certain wood burning devices ~~appliances~~.

PR 445 would not require any new development, but ~~may require minor modifications to buildings or other structures for compliant wood burning appliances or wood burning appliance alternatives (such as natural gas appliances) to comply with the proposed rule~~ would prohibit the installation of wood burning devices in new development. PR 445 would also prohibit the installation of permanent outdoor or indoor non-compliant wood burning devices in existing structures. ~~PR 445 may require replacing or retrofitting existing equipment or altering proposed appliances or fuels. Any new, replacement or retrofit construction would occur at existing commercial facilities or residences, so new use designations, including agricultural designations, are not expected to be altered by the proposed project.~~ Therefore, PR 445 is not expected to convert any classification of farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract.

Based upon these considerations, significant agricultural resource impacts are not anticipated and will not be further analyzed in this Draft EA. Since no significant agriculture resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
III. AIR QUALITY. Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☑	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☑	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☑	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☑	☐
f)	Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑

III.a) and f) Attainment of the state and federal ambient air quality standards protects sensitive receptors and the public in general from the adverse effects of criteria pollutants which are known to have adverse human health effects. PR 445 contributes directly to carrying out the goals of the ~~2003~~ 2007 AQMP by implementing control measure BCM-03~~ MSC-06~~. Consistent with control measure BCM-03~~ MSC-06~~, PR 445 is expected to reduce PM emissions from all affected source categories, which in turn, will contribute to attaining the state and federal ambient air quality standards. Thus, because PR 445 implements control measure BCM-03 ~~MSC-06~~ from the ~~2003~~ 2007 AQMP, it is not expected to conflict or obstruct implementation of the applicable AQMP.

Implementing PR 445 would not diminish an existing air quality rule or future compliance requirement, nor conflict with or obstruct implementation of the applicable air quality plan. It would implement in part the 2003 AQMP control measure BCM-03~~ MSC-06~~.

III.b), c) & d) For a discussion of these items, refer to the following analysis.

Air Quality Significance Criteria

To determine whether or not air quality impacts from adopting and implementing the proposed amendments are significant, impacts will be evaluated and compared to the following criteria. The project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 2-1 are equaled or exceeded.

Table 2-1
Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [a]		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m^3 (recommended for construction) [b] & 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3	
Sulfate 24-hour average	1 ug/m^3	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)	

[a] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

[b] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million ug/m^3 = microgram per cubic meter ≥ greater than or equal to

Construction Air Quality Impacts

~~It is expected that operators at affected facilities will comply with PR 445 by beginning to install the clean technologies listed in the regulation within six months of rule adoption and replacing existing uncontrolled wood burning devices at commercial facilities by 2010. In areas where the PM 2.5 concentrations are above 20 micrograms per cubic meter in 2012, PR 445 would require that residential wood burning heater are replaced or rendered inoperable at the point of real estate transfer. The Preliminary Staff Report for PR 445 estimates that 5,123 natural gas fireplaces would be installed per year; operators at 250 commercial facilities may need to install, replace or render their wood burning appliances inoperable; and 27,414 residences would need to install over ten years, replace or render their wood burning heaters inoperable. It is assumed for the analysis that non-complaint wood burning appliances would be replaced using prefabricated~~

~~compliant wood burning appliances or compliant wood burning appliance alternatives, and that no heavy equipment would be required for their installation.~~

~~PR 445 is not expected to require the installation of propane storage vessels and related piping. It is expected that operators that choose to install propane fueled appliances in lieu of wood burning appliances would do so because other propane devices (stoves, heaters, washers, dryers, etc.) were already in use or planned. Otherwise, it is assumed that operators would use the same source of fuel or electricity used by other existing or planned devices.~~

New ~~Construction~~ Development

PR 445 would prohibit, except as provided for in the exceptions, the installation of wood burning devices in new development effective six months from the date of adoption. The installation of ~~compliant wood burning or wood burning~~ alternative devices ~~appliances~~ in new construction would be similar to the installation of non-compliant wood burning devices ~~appliances~~. ~~The compliant wood burning or wood burning alternative appliances~~ The alternative devices would need to be placed into position and an exhaust/venting system would have to be constructed. ~~Compliant wood burning or wood burning alternative appliances~~ Alternative device exhaust/venting systems typically consist of interconnected ducting. Some systems may require additional ducting for external air. Since the installation of alternative devices is expected to be similar to installing wood burning devices; PR 445 is not expected to produce new development emissions or alter construction emissions.

Existing Facilities

PR 445 would prohibit the installation of permanent non-compliant outdoor or indoor wood burning devices in existing structures effective six months from the date of adoption. For example, if existing wood burning devices were removed (e.g., during a remodel), PR 445 compliant device would need to be installed. PR 445 compliant devices for existing structures include: EPA Phase II-Certified wood burning heaters, a pellet-fueled wood burning heaters, masonry heaters, or wood burning devices or fireplace that meets EPA particulate matter emission standards established by Title 40 CFR, Part 60, Subpart AAA, or dedicated gaseous-fueled fireplace. Replacement of existing non-compliant wood burning appliances with compliant wood burning or wood burning alternative appliances would require the removal of the old appliance and installation of the new appliance. Depending on the type of compliant wood burning or wood burning alternative appliance the exhaust/venting system may be reused, lined, retrofitted or replaced. The new exhaust/venting system may be placed within the existing duct system.

It was assumed that wood burning appliances can be installed or replaced using manual labor and that replacement and installation would occur in one day. Wood burning and alternative appliances are often placed into rooms in areas where heavy duty construction equipment could enter or be used, for example hotel lobbies, restaurants, residences, etc.

PR 445 would not require the installation of new wood burning or alternative appliances, but would only restrict the type of wood burning or alternative appliances installed. Therefore, since the construction of non-compliant and compliant wood burning or alternative appliances is similar, no increase of emissions is expected from new installation of compliant wood burning or alternative appliances, instead of non-compliant appliances.

The PR 445 compliant devices are not expected to be substantially visually different that non-compliant wood burning devices. The installation of these devices is expected to be similar to installing wood burning devices; therefore, PR 445 is not expected to alter construction emissions. Therefore, PR 445 is not expected to generate any new construction emissions.

~~Commercial Facility Wood Burning Appliance Replacement~~

~~The Staff Report estimates that 250 commercial facility operators would have approximately three years to replace non-compliant wood burning appliances. Even if all commercial facilities would wait until the last year to comply with PR 445, on average about one appliance would need to be replaced per day (250 devices/52 weeks per year/5 days per week). To be conservative, it was assumed that a maximum of three commercial facilities would replace or make existing non-compliant wood burning appliances inoperable on the same day. Since replacing wood burning appliances would generate more emissions, to be conservative it was assumed that all 250 wood burning appliances would be replaced.~~

~~Since no heavy equipment is expected to be used during construction, all emissions would be generated by the transportation of certified or alternative appliances to the affected facilities and removal of non-certified appliances from the affected facilities. Table 2-2 presents the daily emissions from replacing wood burning appliances at commercial facilities. Detailed calculations are presented in Appendix B.~~

~~Table 2-2~~
~~Daily Construction Criteria Emissions from Replacement of Wood Burning Appliances at Commercial Facilities~~

~~Description~~	~~CO (lb/day)~~	~~NOx (lb/day)~~	~~SOx (lb/day)~~	~~VOC (lb/day)~~	~~PM10 (lb/day)~~	~~PM2.5 (lb/day)~~
~~Offset Emissions~~	~~1.97~~	~~3.89~~	~~0.004~~	~~0.37~~	~~0.19~~	~~0.18~~

~~Residential Wood Burning Appliance Replacement~~

~~Staff estimates that there are 27,414 residences that may need to replace wood burning heaters in areas where the PM2.5 concentration is above 20 micrograms per cubic meter. Approximately 10 percent of the residences in the district are sold annually. Therefore, approximately 2,741 residences would need to replace wood burning heaters or render the heaters permanently inoperable annually. Assuming a five day work week and 52 weeks per year, on average 11 residences per day (2,741 residences/5 day/week/52 week/year) would be affected by this provision. If it is assumed that there is a fluctuation of ten percent in home sales daily, then 12 residences per day (11 residences x 1.1) may be affected by this provision. Since replacing wood burning heaters would generate more emissions, to be conservative it was assumed that all 27,414 wood burning heaters would be replaced.~~

~~Since no heavy equipment is expected to be used during construction, all emissions would be generated by the transportation of certified or alternative heaters to the affected facilities and removal of non-certified heaters from the affected facilities. Table 2-3 presents the daily emissions from replacing wood burning heaters through property transfer. Detailed calculations are presented in Appendix B.~~

~~**Table 2-3**~~
~~**Daily Construction Criteria Emissions from Replacement of Wood Burning Heaters Because of Property Transfer**~~

~~Description~~	~~CO (lb/day)~~	~~NOx (lb/day)~~	~~SOx (lb/day)~~	~~VOC (lb/day)~~	~~PM10 (lb/day)~~	~~PM2.5 (lb/day)~~
~~Offset Emissions~~	~~23.6~~	~~46.7~~	~~0.05~~	~~4.5~~	~~2.3~~	~~2.1~~

~~Construction emissions from residential wood burning heater replacement would not begin until 2012, which is two years after commercial wood burning appliance replacement is required to be completed. Therefore, the emissions from residential heater replacement would not overlap with commercial appliance replacement. Construction criteria pollutant emissions from replacing non-compliant heaters with compliant heaters prior to property transfer would be higher than replacement of wood burning appliances at commercial facilities. Peak criteria pollutant emissions from construction are presented in Table 2-4. None of the emissions exceed the significance thresholds in Table 2-1. Detailed calculations are presented in Appendix B. Therefore, PR 455 is not significant for construction air quality adverse impacts.~~

~~**Table 2-4**~~
~~**Peak Construction Criteria Emissions and Impacts**~~

~~Description~~	~~CO (lb/day)~~	~~NOx (lb/day)~~	~~SOx (lb/day)~~	~~VOC (lb/day)~~	~~PM10 (lb/day)~~	~~PM2.5 (lb/day)~~
~~Residential Replacement~~	~~23.6~~	~~46.7~~	~~0.05~~	~~4.5~~	~~2.3~~	~~2.1~~
~~Significance Thresholds~~	~~550~~	~~55~~	~~150~~	~~55~~	~~150~~	~~55~~
~~Significant?~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~

Operational Air Quality Impacts

Summary

The overall objective of the proposed project is to reduce PM10 and PM2.5 emissions from wood burning appliances. Since compliant appliances either burn cleaner fuels or burn wood more efficiently, PR 445 would benefit air quality.

Direct Emission Reductions

PR 445 would reduce operational emissions by prohibiting the installation of wood burning devices in new developments ~~from the requirements to install clean appliances into new construction,~~; prohibiting the sale, offer for sale, supply, or installation of new or used permanently installed indoor or outdoor wood burning devices or gaseous fueled devices in existing structures unless they are PR 445-compliant devices; and wood burning prohibitions ("~~no burn~~ wood burning curtailment days" and restricting materials burned in wood burning appliances~~), replacement of non-compliant wood burning appliances in commercial facilities by 2010 and replacement of non-compliant wood burning heaters prior to residential property transfer~~. The operational PM2.5 emission reductions that follow were estimated according to the methodology developed in the Preliminary Draft Staff Report. The remaining operational criteria pollutants PM10, VOC, NOx, SOx and CO were estimated to demonstrate that in addition to PM2.5, PR445 would reduce PM10, VOC, NOx, SOx and CO. Therefore, PR 445

would not be significant for directly emitted operational criteria pollutants from compliant wood burning appliances or alternatively fueled appliances.

PM10, VOC, NOx, SOx and CO were estimated using a methodology and emission factors from AP-42~~, SCAQMD's Annual Emissions Reporting Program, ARB's CEIDARS database and the OMNI Report~~. Emission reductions calculations are presented in Appendix B.

New Development ~~Construction~~

The prohibition of the installation of ~~traditional, uncontrolled fireplaces in new developments, remodels, or permanent outdoor installations~~ wood burning devices is a large source of emission~~s~~ reductions from proposed Rule 445. Emission reductions can be estimated as the differential in emissions from ~~an uncontrolled fireplace~~ a wood burning device to ~~a combination of permissible appliances under the Proposed Rule 445 provisions~~ natural gas fire logs.

~~To estimate Proposed Rule 445 emissions reductions potential, U.S. Census housing census data was used to determine the annual average number of housing units constructed in the district. The number of housing units with fireplaces was then determined based on an ARB assumption that 40 percent of households have fireplaces. (This ARB assumption was corroborated by comparing 2002 AHS data for District households with usable fireplaces with the total number of District households based on 2002 US Census data). An assumption that 75 percent of newly constructed homes have dedicated natural gas fireplaces was then used to estimate the number of traditional, uncontrolled fireplaces that would have been installed in new homes in absence of Proposed Rule 445[26]. It was then presumed that instead of installing traditional, uncontrolled fireplaces in new home construction, a mix of US EPA Phase II certified units, dedicated natural gas units, and electric units would be installed to comply with the regulation. The emission reductions were discounted since 27 percent of wood burning or alternative appliances are not used[27]. The resulting emissions reductions from Proposed Rule 445 provisions for new wood burning appliance installations are estimated to be approximately 113 pounds of PM10 per day beginning in 2008 of which 109 pounds per day is PM2.5. It should be noted that Proposed Rule 445 would also result in cumulative air quality benefits as emissions reductions would be double each year (since 5,213 new fire places would be installed each year). Therefore,~~ Proposed Rule 445 emission~~s~~ reductions from ~~new installation of clean technologies~~ prohibiting the installation of wood burning devices in new developments can be estimated to be approximately ~~796~~ 5,398 pounds of PM10 per day by 2014 of which ~~712~~ 5,164 pounds per day would be PM2.5. The emission reductions from clean burning appliances are presented in Tables ~~2-5 and 2-6~~ 2-2. The calculations of daily emission reductions can be found in the Appendix B of this Draft EA.

Installation of New or Used Permanently Installed Indoor or Outdoor Devices

PR 445 would prohibit the installation of new or used permanently installed indoor or outdoor wood burning devices or gaseous-fueled devices. PR 445 compliant devices for existing structures include: EPA Phase II-Certified wood burning heaters, pellet-fueled wood burning heaters, masonry heaters, or wood burning devices or fireplaces that meet EPA particulate matter emission standards established by Title 40 CFR, Part 60, Subpart AAA, or dedicated gaseous-fueled fireplaces. This prohibition is expected to affect residents or facilities undergoing remodeling or repair. Since the number of residents or facilities that remodel or repair fireplaces

[26] ibid, SCAQMD, 2007.
[27] ibid, SCAQMD, 2007.

is not known, operational emission from these residents or facilities is speculative. Therefore, pursuant to CEQA Guidelines §15145, the emissions are not estimated and no evaluation is provided.

~~Table 2-5~~
~~Daily Criteria Pollutant Emission Reductions from the Installation of Compliant Appliances in New Construction for a Single Year~~

~~Description~~	~~Annual Number of Units[a]~~	~~VOC, lb/day~~	~~NOx, lb/day~~	~~SOx, lb/day~~	~~CO, lb/day~~	~~PM10, lb/day~~	~~PM2.5, lb/day~~
~~Emissions Reduction Wood Burning, lb/day~~	~~512~~	~~24.0~~	~~0.5~~	~~0.0~~	~~78.1~~	~~7.9~~	~~7.6~~
~~Emissions Reduction Natural Gas, lb/day~~	~~4,355~~	~~273~~	~~7.6~~	~~2.0~~	~~1,300~~	~~139~~	~~134~~
~~Emission Reduction, Electric, lb/day~~	~~256~~	~~16~~	~~0.8~~	~~0.1~~	~~77~~	~~8.2~~	~~7.9~~
~~Total Reductions, lb/day~~	~~-~~	~~313~~	~~9~~	~~2~~	~~1,455~~	~~155~~	~~149~~
~~Total Reduction with Discount for Fire Places Not Used, lb/day[b]~~	~~-~~	~~**228**~~	~~**7**~~	~~**1.6**~~	~~**1,062**~~	~~**113**~~	~~**109**~~

~~a) Staff Report estimates that 5,213 fireplaces would be installed per year and that 10 percent are EPA Phase II units, 85 percent are natural gas units and five percent are electric units.~~

~~b) Staff Report estimates that 27 percent of the residential fireplaces are not used. Therefore, only 73 percent of the total reductions are reported.~~

~~Table 2-6~~
~~Daily Criteria Pollutant Emission Reductions from the Installation of Compliant Appliances in New Construction by 2014~~

~~Description~~	~~Number of Units 2007 to 2014[a]~~	~~VOC, lb/day~~	~~NOx, lb/day~~	~~SOx, lb/day~~	~~CO, lb/day~~	~~PM10, lb/day~~	~~PM2.5, lb/day~~
~~Emissions Reduction Wood Burning, lb/day~~	~~3,586~~	~~167.7~~	~~3.4~~	~~0.0~~	~~546.4~~	~~55.5~~	~~53.4~~
~~Emissions Reduction Natural Gas, lb/day~~	~~30,482~~	~~1,910~~	~~53~~	~~14~~	~~9,102~~	~~972~~	~~935~~
~~Emission Reduction, Electric, lb/day~~	~~1,793~~	~~113~~	~~6~~	~~0.8~~	~~536~~	~~57~~	~~55~~
~~Total Reductions, lb/day~~	~~-~~	~~2,190~~	~~63~~	~~15~~	~~10,185~~	~~1,084~~	~~1,044~~
~~Total Reduction with Discount for Fire Places Not Used, lb/day[b]~~	~~-~~	~~**1,599**~~	~~**46**~~	~~**11**~~	~~**7,435**~~	~~**792**~~	~~**762**~~

~~a) Staff Report estimates that 5,213 fireplaces would be installed per year over seven years and that 10 percent would be EPA Phase II units, 85 percent would be natural gas units and five percent would be electric units.~~

~~b) Staff Report estimates that 27 percent of the residential fireplaces are not used. Therefore, only 73 percent of the total reductions are reported.~~

Table 2-2
Total Daily Criteria Pollutant Emission Reductions from the Installation of Compliant Devices in New Development from 2008-2014 (lb/day)

Description	VOC	NOx	SOx	CO	PM2.5	PM10
Wood Burning Reductions	277	53	8.3	5,150	635	660
Natural Gas Emissions	3.0	51	0.3	21.5	3.9	4.1
New Development Reductions	274	2.3	8.0	5,128	631	655

Wood Burning Prohibitions

~~*No Burn* Wood Burning Curtailment Days~~

Additional emissions reductions are associated with Proposed Rule 445 wood burning prohibitions. The wood burning prohibitions were estimated by assuming that ~~50~~ 75 percent compliance rate of the wood burning in the district would be curtailed. Public education and outreach is also anticipated to increase and ensure emission reductions primarily on the ~~no-burn~~ curtailment day restrictions~~; however, a conservative 50 percent compliance rate has been used for the early years of program implementation~~. The ~~PM2.5~~ wood burning emissions inventory was taken from the ARB emissions inventory. ~~OMNI Report. The PM10 emissions inventory was estimated from the PM2.5 emissions inventory using the CEIDARS ratios of PM2.5 and PM10 to PM in wood burning emissions. The remaining criteria emissions (VOC, NOx, SOx, and CO) were estimated by multiplying the ARB emissions inventory for each remaining criteria pollutant by the ratio of the OMNI PM2.5 emissions inventory to the ARB PM2.5 emissions inventory.~~ The wood burning prohibition was estimated by multiplying wood burning emissions inventory by ~~50~~ 75 percent. The emission reductions from the burning prohibition are presented in Table 2-3~~-2-7~~.

~~The wood burning prohibitions presented in this analysis are less than the wood burning prohibition presented in the Staff Report and Chapter 1 of this EA. The wood burning prohibition in the Staff Report was estimated based on a burning season (November through March), while the wood burning prohibition presented in this environmental analysis was estimated using both the ARB and OMNI Report emission inventories, which were estimated on an annual basis. Since the wood burning inventory presented here is less than that presented in the Staff Report, it is more conservative.~~

Table 2-3~~-2-7~~
Daily Criteria Pollutant Emission Reductions from Wood Burning Prohibitions in 2014

Description	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Burning Prohibitions	~~4,583~~ 595	~~882~~ 124	~~138~~ 21	~~76,303~~ 10,075	~~10,488~~ 1,374	~~10,100~~ 1,333

Material Burned Prohibitions

PR 445 includes a provision that prohibits the burning of garbage, treated wood, particle board, plastic products, rubber products, waste petroleum products, paints, coatings, solvents, coal, or

any other product not intended by the manufacturer for use as fuel in a wood burning appliance. Burning of these materials is typically restricted by local fire regulations. The emissions from these materials would be based on the specific materials burned. Since, the compositions of these materials are unknown and the number of operators at affected facilities that currently burn the prohibited materials in wood burning appliances are unknown, emissions reductions from this prohibition cannot be estimated.

Commercial Facility Wood Burning Appliance Replacement

Emissions reductions would also be associated with the Proposed Rule 445 requirement that prohibits the use of uncontrolled wood burning appliances at existing commercial facilities after 2010, but these reductions are estimated to be relatively small due to the small number of these sources. To calculate emissions reductions, it has been estimated that there are 250 traditional, uncontrolled fireplaces operating at commercial facilities (hotels, restaurants, etc.) based on a limited internet search. For these sources, it is estimated that traditional, uncontrolled fireplaces would be replaced with a higher percentage of EPA Phase II certified units due to the desire to continue wood burning for aesthetic purposes. The remaining traditional, uncontrolled fireplaces would be replaced with dedicated natural gas units. The resulting PM10 and PM2.5 emissions reductions are estimated be approximately 21 and 20 pounds per day respectively. All commercial wood burning appliances would need to be compliant by 2010. The emission reductions from commercial wood burning appliance replacement are presented in Table 2-8. The calculations of daily emission reductions can be found in Appendix B of this Draft EA.

Table 2-8
Daily Criteria Pollutant Emission Reductions from the Replacement of Commercial Facility Wood Burning Appliances

Description	Total Number of Units	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Natural Gas, lb/day	125	21	0.4	0	68	6.9	6.7
Emissions Reduction Wood Burning, lb/day	125	28	0.01	0.205	133	14	14
Total Reductions, lb/day	-	**49**	**0.4**	**0.205**	**201**	**21**	**20**

Residential Wood Burning Appliance Replacement

Additional emission reductions would be associated with requirements to replace, remove, or render inoperable all non-EPA Phase II-certified wood heaters upon the sale of real property in areas impacted by PM2.5 levels above 20 microgram per cubic meter. In order to estimate emissions reductions, assumptions were made regarding the number of wood burning heaters that may be affected, the frequency of property transfers, and compliance options by those properties affected. To represent a conservative estimate, it was presumed that the property transfer requirements would apply to all wood heaters in Riverside and San Bernardino Counties. Frequency of property transfers was based on a Chicago Title Company database that identified an average turnover of property ownership to be 10.5 years. Property owner compliance options were presumed as follows: 70 percent replacement with EPA Phase II-certified wood heaters, 20 percent replacement with dedicated natural gas units and ten percent removal/rendered permanently inoperable. Based on these assumptions, the emissions reductions associated with

Proposed Rule 445 property transfer requirements are estimated to be 175 and 170 pounds per day respectively after the first year the property transfer requirement occurs. If all property were transferred within the 10.5 years, the total emissions reductions per day from property transfer in 2022 would cumulatively increase to 349 pounds of PM10 per day of which 341 pounds of would be PM2.5 by 2014. These emission reductions were not included as a part of the reductions for the proposed projects since the requirements associated with these reductions may not be triggered. In addition, while approximately 10 percent of homes are sold in a given year not every home would be sold within 10 years (i.e., some homes may be sold multiple times; other homes may not be sold). Emission reductions from replacement of residential wood burning heaters are presented in Tables 2-9 and 2-10. The calculations of daily emission reductions can be found in Appendix B of this Draft EA.

Table 2-9
Daily Criteria Pollutant Emission Reductions from the Replacement of Residential Wood Burning Heaters Based on Property Transferred for a Single Year

Description	Total Number of Units	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Wood Burning, lb/day	1,919	304	6.2	0.0	992	101	97
Emissions Reduction Natural Gas, lb/day	548	117	5.3	0.9	556	59	59
Emission Reduction, Permanent Inoperation, lb/day	274	58	3.1	0.4	278	30	29
Total Reductions, lb/day	-	479	15	1	1,826	190	185
Total Reductions with Discount for Fire Places Not Used, lb/day	-	**441**	**13**	**1**	**1,680**	**175**	**170**

Staff Report estimates that 2,741 heaters would be replaced and that 70 percent would be EPA Phase II units, 20 percent would be natural gas units and five percent would be rendered inoperable.

Table 2-10
Daily Criteria Pollutant Emission Reductions from the Replacement of Residential Wood Burning Heaters by 2014

Description	Total Number of Units	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Wood Burning, lb/day	3,838	609	12.3	0.0	1,984	202	194
Emissions Reduction Natural Gas, lb/day	1,097	233	10.6	1.8	1,112	119	119
Emission Reduction, Permanent Inoperation, lb/day	548	117	6.2	0.9	556	59	57
Total Reductions, lb/day	-	959	29	3	3,652	380	370
Total Reductions with Discount for Fire Places Not Used, lb/day	-	**882**	**27**	**2**	**3,360**	**349**	**341**

Staff Report estimates that 2,741 heaters would be replaced per year and that 70 percent would be EPA Phase II units, 20 percent would be natural gas units and 10 percent would be rendered inoperable.

Summary of Emission Reductions

The total emission reductions from PR 445 are presented in Table 2-4 ~~1-11~~. ~~The emission reductions from residential change-outs is not included in the Table 1-11, since residential change-outs are dependent on whether the concentrations of PM2.5 exceed 20 micrograms per cubic meter after 2011. Since air quality is expected to improve though other AQMP control measures and existing rules and regulations, the reductions are considered speculative at this time.~~

~~**Table 1-11**~~
~~**Total Daily Criteria Pollutant Emission Reductions by 2014**~~

~~**Description**~~	~~**VOC, lb/day**~~	~~**NOx, lb/day**~~	~~**SOx, lb/day**~~	~~**CO, lb/day**~~	~~**PM10, lb/day**~~	~~**PM2.5, lb/day**~~
~~New Construction~~	~~1,599~~	~~46~~	~~11~~	~~7,435~~	~~792~~	~~762~~
~~Burning Prohibitions~~	~~4,583~~	~~882~~	~~138~~	~~76,303~~	~~10,488~~	~~10,100~~
~~Replacement of Commercial Wood Burning Appliances by 2010~~	~~48.8~~	~~1.2~~	~~0.2~~	~~201.3~~	~~21.1~~	~~20.4~~
~~Total Reductions~~	~~**6,231**~~	~~**929**~~	~~**150**~~	~~**83,940**~~	~~**11,301**~~	~~**10,883**~~

Table 2-4
Total Daily Criteria Pollutant Emission Reductions by 2014

Description	**VOC, lb/day**	**NOx, lb/day**	**SOx, lb/day**	**CO, lb/day**	**PM10, lb/day**	**PM2.5, lb/day**
New Construction	274	2.3	8.0	5,128	655	631
Burning Prohibitions	595	124	21	10,075	1,374	1,333
Total Reductions	870	125.9	28.6	15,204	2,029	1,964

Indirect Operational Criteria Emissions

Since compliant wood burning and alternative fueled devices are relatively maintenance free, the only operational emissions associated with these devices would be delivery of fuel and maintenance. Compliant wood burning appliances would require fewer trips because they burn fuel more efficiently. Wood has a heating value of 20,000,000 British thermal units (Btu/cord) and liquefied petroleum gas (LPG or propane) has a heating value of 91,300 Btu/gal, based on these heating values 4.4 cubic feet of wood would be required for every cubic foot of propane burned. Therefore, the use of propane would result in fewer vehicle trips. Natural gas and electric appliances are expected to use utilities already connected to the facility or residence (see Table 2-5 ~~2-12~~). Compliant wood burning appliances would be more efficient so less wood would be burned; therefore, less wood delivery would be required.

In addition, consumers will be provided with information on how to burn more efficiently and on health effects of wood smoke, both leading to reductions in wood consumption. Other districts have observed an overall decline in bulk wood sales from voluntary measures simply due to increased public awareness.

Table 2-5 ~~2-12~~
Fraction of Households that Used Gas for Any Purpose in 2002[1,2]

Area, Reference	Fraction of Households
U.S., References 3.20 and 3.21	0.701
Anaheim-Santa Ana, Reference 3.1	0.915
Riverside-San Bernardino-Ontario, Reference 3.2	0.958
Los Angeles-Long Beach, References 3.3 and 3.4	0.952
Population Weighted Los Angeles Area	0.946
National to Los Angeles Area Adjustment Factor 1.36	

Source: OMNI Environmental Services, Inc., Residential Wood Combustion Emission Inventory South Coast Air Basin and Coachella Valley Portion of Salton Sea Air Basin 2002 Base Year, October 24, 2006

1) Calculations
   There are no 2002 AHS data for the United States. The 2002 estimate was calculated by linearly extrapolating between the 2001 and 2003 data.
   There are no 2002 AHS data for the Los Angeles-Long Beach Metropolitan area. The 2002 estimate was calculated by linearly extrapolating between the 1999 and 2003 data.
2) Sum of piped and bottled gas

Based on the previous discussion, operational air quality impacts are not significant.

Health Risk Analysis

Since PR 445 compliant wood burning devices ~~appliances~~ or alternative devices are more efficient, requiring the installation or replacement of non-compliant devices ~~appliances~~ with these compliant devices ~~appliances~~ 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 ~~appliances~~ with natural gas appliances would reduce toxic emissions. Electric devices ~~appliances~~ are not considered to generate emissions, since emission from power plants are capped by the RECLAIM program (SCAQMD Regulation XX) and electric generating equipment are required to be at best available retrofit control technology (BARCT) levels. Further, new electric generating facilities would be subject to Rule 1401 and existing electric generating facilities are subject to the risk reduction requirements of Rule 1402;~~,~~ therefore, electric appliances are expected to reduce toxic emissions.

Based on the Draft Preliminary Staff Report, commercial facilities (one to two cords per year) use burn more wood than residences (0.28 cord per year). Therefore, wood burning appliances at a commercial facility would generate more health risk than wood burning heaters at a residence. The hours of operation were estimated using the high end of wood usage from the Staff Report (840 kilograms per year) to be conservative, because higher wood usage would lead to larger health risk. The lower end of wood usage range was used to estimate the emission reductions, because the lower wood usage leads to lower emissions, which would lead to lower emission reductions. A Tier II health risk assessment was completed according to Version 7 of the SCAQMD Health Risk Procedures for Rules 212 and 1401 for this analysis. Conservative assumptions were made for the Tier II health risk assessment. . It was assumed that sensitive receptors would be within 25 meters of a commercial facility. The commercial facility was

assumed to be in the West Los Angeles area. The stack height was assumed to be less than 20 feet tall.

Based on emissions from a single unit, the carcinogenic health risk from an uncertified wood burning appliance could be as high as 8.7 in one hundred million (8.7×10^{-8}). Carcinogenic health risk from an EPA certified wood burning device ~~appliance~~ is 6.0 in hundred one million (6.0×10^{-8}). Carcinogenic health risk from a natural gas device ~~appliance~~ is estimated to be 0.001 in a trillion (1.1×10^{-12}). Therefore, replacement of uncertified wood burning appliances would reduce carcinogenic risk. Detailed calculations can be found in Appendix B.

The chronic noncarcinogenic hazard indices for non-compliant and compliant wood burning appliances are below the significance threshold of 1.0. Chronic noncarcinogenic hazard indices for natural gas appliances are also less than the significance threshold of 1.0. Therefore, by installing or replacing non-compliant wood burning devices ~~appliances~~ with compliant wood burning or natural gas devices chronic health risk would be reduced. Detailed calculations can be found in Appendix B. Therefore, since both compliant wood burning appliances and natural gas appliances would reduce all chronic hazard indices health risk, PR 445 would be less than significant for chronic noncarcinogenic health risk.

Acute noncarcinogenic hazard indices for non-compliant and compliant wood burning devices are less than the significance threshold of 1.0. The acute noncarcinogenic hazard indices from natural gas appliances are less than 1.0. The acute hazard indices for the compliant wood burning devices ~~appliances~~ and natural gas devices ~~appliances~~ would be less than that of the non-compliant devices ~~appliances~~. Therefore, since compliant wood burning appliances and natural gas appliances would less than the acute noncarcinogenic health risk for non-compliant wood burning devices ~~appliances~~, PR 445 would not be significant for acute noncarcinogenic health risk. Detailed calculations can be found in Appendix B.

In addition to reducing PM10 and PM~~1~~2.5 emissions, PR 445 would also reduce carcinogenic and noncarcinogenic health risk in the district and, therefore, would not create significant adverse health risks.

Greenhouse Gas and Global Warming Emissions Analysis

In addition to criteria pollutant emissions, combustion processes generate greenhouse gas (GHG) emissions that have the potential to affect global climate. The following GHG analysis focuses on CO2 emissions because this is the primary GHG pollutant emitted during the combustion process and is the GHG pollutant for which emission factors are most readily available. CO2 emissions were estimated using emission factors from EPA's AP-42.

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for the following reasons. 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. Since the half-life of CO2 is approximately 100 years, the effects of GHGs are longer-term, affecting global climate over a relatively long time frame. Further, the action of GHGs is global in nature, rather than local or even regional. As a result, GHG emission impacts are considered to be cumulative impacts rather than project-specific impacts.

Typical GHG emission inventories (EPA[28], ARB[29], etc.) present directly emitted GHGs during a given year. However, a potentially more comprehensive measure of global climate change caused by GHGs is through a life cycle analysis. A life cycle analysis would include estimates of the total amount of GHG emissions from an entire process from start to finish, including all intervening steps. Life cycle analyses are often geographically specific. For example, in the case of wood burning devices a life cycle analysis would attempt to estimate emissions from seeding activities, cultivation, harvest, processing, packaging, bulk transportation, storage, sales, and consumption. Further, parameters used in the life cycle analysis for wood burning devices would rely upon characteristics of the fuels (heating values, moisture content, type of wood, etc.), production methods (wood grown in a sustainable manner, natural gas from pipeline or shipped, etc.), fuel sources (wood harvested as part of forest husbandry), and bulk transportation impacts (distance, fuel used, etc.).

The potential weaknesses of a life cycle analysis in the case of wood burning devices are that many assumptions made in life cycle analyses are based on incomplete information, poorly understood processes, or information that is not widely applicable. For example, although black carbon[30] is a product of incomplete combustion associated with burning biomass and contributes to global climate change, factors such as residency time in the atmosphere, deposition, its affect on the albedo effect, emission factors, etc. are not well established. As a result, black carbon GHG emission effects are considered speculative and not further analyzed in this analysis.

One common assumption in life cycle analyses for wood burning is that overall GHG emissions are assumed to be zero.[28] This assumption relies on the fact that the destruction of biomass, either through combustion or natural processes, produces CO2 emissions that may be absorbed in equal amounts into new biomass growth. Since the analysis is based on a mass balance process, it is assumed that the CO2 recycling would occur whether the biomass naturally decays or is burned. This assumption also relies on whether or not the biomass is sustainably developed. As with other assumptions associated with the life cycle analysis, the assumption that burning wood has zero GHG effects, is not necessarily the case if, for example trees are not replaced in equal amounts compared to the number of trees removed for firewood.

Dr. James Houck provided SCAQMD staff with a GHG life cycle analysis for the burning of natural gas, wood and manufactured fire logs.[31] The information provided does not appear to have been peer reviewed. The Australian Greenhouse Office of the Federal Department of Environment and Heritage has also published a document on the life cycle assessment of greenhouse gas emissions from domestic woodheating.[32]

[28] EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf, April 15, 2007

[29] ARB, Statewide Greenhouse Gas (GHG) Emissions Inventory 1990 to 2004, http://www.arb.ca.gov/cc/ccei/emsinv/emsinv.htm.

[30] http://www.nature.com/climate/2007/0709/full/climate.2007.41.html.

[31] Houck, James, Ph.D., Global Warming Reduction Benefits of Manufactured Biowax-Fiber Fireplace Logs, March 27, 2007.

[32] Australian Greenhouse Office of the Department of Environment and Heritage, Life Cycle Assessment of Greenhouse Gas Emissions from Domestic Woodheating, http://www.greenhouse.gov.au/nrm/publications/pubs/firewood.pdf, September 2003.

SCAQMD staff reviewed these two documents on wood burning life cycle analysis in an effort to prepare a wood burning versus natural gas combustion life cycle analysis to evaluate potential GHG impacts from PR 445. Staff found it difficult to apply the same parameters of the Houck and Australian life cycle analyses to the analysis of GHGs from PR 445 for the following reasons. Wood burned in California is different than the wood burned in Australia. In addition, some of the intervening steps from wood harvest to combustion are very different than the intervening steps in the two life cycle analyses. For example, based on information provided to SCAQMD staff, packaged wood is transported from northern California to southern California, warehoused, then delivered to grocery stores, where it is then sold to customers. However, the actual sources of firewood, cultivation practices, distances traveled, etc., are not known.

SCAQMD staff completed CO2 analyses for several scenarios under PR 445. Several scenarios were analyzed because there is so much uncertainty in the underlying assumptions for wood burning compared to natural gas combustion. A range of potential impacts was estimated from these scenarios. Staff also examined several possible options for evaluating the significance of GHGs from PR 445.

Two GHG emission scenarios were completed using AP-42 emission factors. In the first analysis, direct emissions from wood burning were compared to direct emissions from natural gas burning. In this analysis, there would be a reduction of 4,180 metric tons of CO2 emissions in 2014 as a result of PR 445. In the second analysis, biomass burning emissions were assumed to be zero (i.e., wood burning emissions were assumed to be zero, because the CO2 emissions would be absorbed into new biomass growth). Direct biomass GHG emissions were excluded to show the affect, when biomass is assumed to be renewable. In this analysis, there would be an increase of 4,893 metric tons of CO2 emissions in 2014, which is based primarily on increased natural gas combustion in wood burning devices installed in future new development.

In spite of the differences between conditions in southern California and the conditions evaluated in the two life cycle analyses evaluated by staff, SCAQMD staff applied the life cycle emission factors developed by Houck to the estimate GHG emissions from new development that would be subject to PR 445. The emissions factors assume that biomass direct combustion emissions are zero and secondary emissions related to production of natural gas and fire wood are included. Based on the lifecycle emission factors, PR 445 would generate 1,221 metric tons of CO2 in 2014.

Lastly, for completeness, SCAQMD staff estimated CO2 emissions using only the direct combustion emission factors used in the life cycle analysis. When the direct emissions of wood burning and natural gas are compared, PR 445 would generate 1,755 metric tons of CO2 in 2014. When direct biomass combustion emissions were assumed to be zero, PR 445 would generate 1,456 metric tons of CO2 in 2014. CO2 emissions from all of these analyses are summarized in Table 2-6.

As shown in Table 2-6, 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 PR 445. For example, in 2014, when estimating direct emissions, replacing wood burning devices with natural gas combustions shows a CO2 emission reduction in addition to PM10 emission reductions. If direct biomass (wood) burning emissions are excluded, that is assumed to be zero, then switching to natural gas combustion in compliance

with PR 445 could result in an increase in CO2 emissions by 1,221 to 4,893 metric tons for the peak year of 2014. Further, the actual source locations of firewood used in southern California is not known and it is not known if firewood is generated from sustainably produced wood forest sources. These two unknown parameters add additional uncertainty to the GHG analysis for PR 445, so it is unclear which end of the GHG emissions range shown in Table 2-6 more accurately represents the actual GHG impacts of PR 445.

Table 2-6
Potential CO2 Emissions from Three Scenarios for 2014

Scenario	Comparison of CO2 Emissions Between Natural Gas and Wood Combustion, metric ton	CO2 Emissions from Natural Gas Combustion, metric ton	Comparison of CO2 Lifecycle Emissions Between Natural Gas and Wood Burning Combustion, metric ton
AP-42 Direct Emissions	(4,180)	4,893	N/A
Houck Life Cycle Emissions	N/A	N/A	1,221
Houck Direct Emissions	(1,755)	1,456	N/A

Numbers in parentheses are negative.
CO2 Emissions from Natural Gas Combustion assumes emissions from biomass (wood) burning is absorbed by similar new trees (i.e., biomass is renewable).
No direct wood burning CO2 emissions are included in the Houck life cycle analyses emissions, because the life cycle analysis assumed biomass is renewable.

In spite of the uncertainty inherent in the GHG analysis for PR 445, even if the worst-case value of 4,893 metric tons of CO2 for the year 2014 is correct, this amount of GHG emissions generated in 2014 would be less than significant for the following reasons. Neither SCAQMD nor any other air regulatory agency in California has established a significance threshold for GHG emissions yet. In the absence of a specific significance threshold, SCAQMD staff has evaluated significance for projects where it is the lead agency on a case-by-case basis. In this analysis, SCAQMD staff has used a variety of benchmarks to evaluate GHG impacts. As additional information is compiled with regard to the level of GHG emissions that constitute a significant cumulative climate change impact, SCAQMD will continue to revisit and possibly revise the level of GHG emissions considered to be significant.

In its *CEQA & Climate Change* document (January, 2008), CAPCOA identifies many potential GHG significance threshold options. The CAPCOA document indicates that establishing quantitative thresholds is a balance between setting the level low enough to capture a substantial portion of future residential and non-residential development, while also setting a threshold high enough to exclude small development projects that will contribute a relatively small fraction of the cumulative statewide GHG emissions. For example, CAPCOA identifies one potential significance threshold as 10,000 metric tons per year, which was considered by the Market Advisory Committee for inclusion in a Greenhouse Gas Cap and Trade System in California. Another potential threshold identified by CAPCOA is 25,000 metric tons per year, which is

CARB's proposed mandatory reporting threshold under AB 32. GHG emissions in the year 2014 from PR 445 would be lower than both of these reporting thresholds.

Finally, another approach to determining significance is to estimate what percentage of the total inventory of GHG emissions are represented by emissions from a single project. If emissions are a relatively small percentage of the total inventory, it is possible that the project will have little or no effect on global climate change. According to available information, the statewide inventory of CO2eq. emission is as follows: 1990 GHG emissions equal 427 million metric tons of CO2eq. and 2020 GHG emissions equal 600 million metric tons of CO2eq. with business as usual. Interpolating an inventory for the year 2014 results in 565 million metric tons of CO2eq. CO2 emissions in 2014 of 4,893 metric tons from PR 445 represent 0.00086 percent of the statewide GHG inventory in 2014 (Table 2-7). This small percentage of GHG emissions compared to the total projected statewide GHG emissions inventory is another basis for the SCAQMD's conclusion that GHG emissions from implementing PR 445 are less than significant.

Table 2-7
Comparison of Proposed Rule 445 CO2 Emissions to the 2014 Statewide CO2 Emissions

2014 PR 445 Direct CO2 Emissions (metric ton/yr)	2014 PR 445 Direct CO2 Emissions (million metric ton/yr)	2014 Statewide CO2 Emissions (million metric ton/yr)	Percentage of PR 445 to Statewide CO2 emissions
4,893	0.004893	565	0.00086

PR 445 is part of a comprehensive ongoing regulatory program that includes implementing related SCAQMD 2007 AQMP control measures as amended or new rules to attain and maintain with a margin of safety all state and national ambient air quality standards for all areas within its jurisdiction. The 2007 AQMP estimates a CO2 reduction of 427,849 metric tons per year by 2014, and a CO2 reduction of 1,523,445 metric ton per year by 2020. Therefore, PR 445 in connection with other 2007 AQMP control measures is not considered to be cumulatively significant.

Since GHG emissions are considered cumulative impacts, and PR 445 GHG emissions are below the 10,000 metric ton per year Market Advisory Committee threshold, 25,000 metric ton per year CARB proposed mandatory reporting threshold under AB 32, a small percentage of the total statewide GHG inventory in 2014, and, with other control measures in the 2007 AQMP, which is a comprehensive ongoing regulatory program that would reduce overall CO2 emissions; cumulative GHG adverse impacts from PAR 445 are not considered significant.

III.d) Affected facilities are not expected to expose sensitive receptors to substantial pollutant concentrations from the implementation of PR 445 for the following reasons: 1) new installation of compliant wood burning or alternative appliances would be the same as installation of non-compliant appliances; 2) there are no significant construction or operational emission increases associated with the proposed rule; and 3) PR 445 would require cleaner fuels or more efficient combustion. Therefore, significant adverse air quality impacts to sensitive receptors are not expected from implementing PR 445.

III.e) Historically, the SCAQMD has enforced odor nuisance complaints through SCAQMD Rule 402 - Nuisance. Affected facilities are not expected to create objectionable odors affecting a substantial number of people for the following reasons: 1) new installation of compliant wood burning or alternative devices ~~appliances~~ would be the same as installation of non-compliant appliances; 2) PR 445 would require cleaner fuels or more efficient combustion would reduce the emissions and therefore reduce odors; and installation of compliant devices ~~appliances~~ does not require heavy construction equipment, which is often a source of odors from diesel combustion. 3) PR 445 prohibits burning trash, coal and other undesirable materials and this should also reduce odors.

Conclusion

Based on the preceding discussion, PR 445 is expected to reduce PM10 emissions by 2,029 ~~11,301~~ pounds per day of which by 1,964 ~~10,100~~ pounds per day are PM2.5 emissions, which is an air quality benefit. The proposed project is also expected to reduce the remaining criteria pollutant emissions, NOx, VOC, SOx and CO, and toxic pollutants by prohibiting ~~requiring~~ installation of ~~lower polluting compliant appliances~~ wood burning devices in new development and non-compliant devices in existing structures, and establishing mandatory curtailment days. Secondary criteria pollutants would be reduced since compliant or alternatively fueled devices ~~appliances~~ are more efficient requiring less fuel deliveries.

The proposal has no provision that would cause a violation of any air quality standard or directly contribute to an existing or projected air quality violation. The lower PM10 and PM2.5 emissions from wood burning devices ~~appliances~~ or alternative fueled devices would assist in reducing overall PM10 and PM2.5 emissions throughout the district.

Since PM10 and PM2.5 air quality impacts from implementing PR 445 are seen as benefits and PR 445 would not cause an exceedance of any of the air quality significance thresholds in Table 2-1, air quality impacts are not considered to be cumulatively considerable as defined in CEQA Guidelines §15065(c). Therefore, the proposed project is not expected to result in significant averse cumulative impacts for any criteria pollutant.

Thus, PR 445 is not expected to result in significant adverse air quality impacts and mitigation measures are not required.

		Potentially Significant Impact	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?	☐	☐	☑
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?	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
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?	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑
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?	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

PR 445 would reduce particulate matter from wood burning appliances in residential and commercial operations. To reduce PM2.5 emissions from affected equipment, PR 445 would restrict the sale, supply, installation or transfer of new wood burning devices ~~appliances~~, materials burned in a wood burning ~~a~~ device ~~appliance~~, and operations of certain wood burning devices ~~appliances~~.

IV.a), b), c), & d) PR 445 would only affect wood burning devices ~~appliances~~. The primary method of compliance will be to prohibit the installation of non-compliant wood burning devices ~~appliances~~, replace or eliminate ~~non-compliant~~ wood burning devices ~~appliances at~~ in new development ~~commercial facilities by 2010~~, and implement mandatory wood burning curtailments in 2013~~eliminate non-compliant wood burning heaters in residences transferred in areas with PM2.5 concentrations greater than 20 micrograms per cubic meter beginning in 2012~~.

PR 445 would not require or induce new residential or commercial developments, but would prohibit the installation of wood burning devices in new development ~~require that if wood burning appliances are included in any of these types of new development, PR 445 would require compliant appliances be installed~~. New or replacement devices in existing structures ~~appliances~~ would be required to be PR 445 compliant. Installation of new compliant devices ~~appliances~~ is expected to be similar to the installation of non-compliant appliances. Therefore, there would be no additional impacts from installing ~~compliant appliances~~ non-wood burning devices in new construction projects or new or used PR 445 compliant devices installed in existing structures.

~~At existing commercial facilities and properties transferred, non-compliant appliances would be required to be made inoperable or replaced. Appliances would be made inoperable by removing key components or permanently sealing entrances for fuel sources and or sealing flues. It is expected that any removal or installation of wood burning or alternative appliances/heaters would occur within existing commercial facilities/residences without the need for heavy construction equipment.~~

~~The primary affects of PR 445 are to require replacement of noncompliant appliances in existing residential and commercial operations and to require compliant appliances in new residential and commercial operations by specific compliance dates. This means that~~ PR 445 ~~will be required in affected~~ would affect facilities that are already in existence or prohibit the installation of wood burning devices in new development, which means that Greenfield properties have already been disturbed, but not as a result of PR 445. Any new residential or commercial operations that must comply with PR 445 are constructed for business reasons other than to comply for business

reasons other than to comply with PR 445. Such projects may or may not have adverse impacts on biological resources. However, these projects would be built regardless of whether or not PR 445 is in effect. As a result, PR 445 would not directly or indirectly affect riparian habitat, federally protected wetlands, or migratory corridors. For the same reasons PR 445 is not expected to adversely affect special status plants, animals, or natural communities.

IV.e) & f) PR 445 would not conflict with local policies or ordinances protecting biological resources nor local, regional, or state conservation plans because it will only affect or prohibit wood burning devices ~~appliances~~ in existing or new residential or commercial operations. Additionally, PR 445 will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan for the same reason.

The SCAQMD, as the Lead Agency for the proposed project, has found that, when considering the record as a whole, there is no evidence that the proposed project will have potential for any new adverse effects on wildlife resources or the habitat upon which wildlife depends. Accordingly, based upon the preceding information, the SCAQMD has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in §753.5 (d), Title 14 of the California Code of Regulations.

Based upon these considerations, significant adverse biological resources impacts are not anticipated and will not be further analyzed in this Draft EA. Since no significant adverse biological resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	**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 §15064.5?	☐	☑	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑
d)	Disturb any human remains, including those interred outside a formal cemeteries?	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:
- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

V.a) PR 445 includes an exception that would exclude properties that are registered in a historical registry or historical buildings located in a historic preservation overlay zone from the ~~property transfer~~ compliant wood burning heater requirements. Therefore, PR 445 does not have the potential to affect residences or commercial operators that could be considered historically significant as defined in CEQA Guidelines §15064.5.

~~Significant adverse impacts to cultural resources that are not listed in historical registries or located in historical preservation overlay zones are not expected for the following reasons. Compliant appliances are not expected for the following reasons. Compliant appliances are prefabricated and dropped into place without the need for heavy construction equipment that could damage historic structures. Since compliant appliance are prefabricated and dropped into place, they do not require structural modifications that would alter or diminish the architectural integrity of the structure. Similarly, rendering a fireplace inoperable can be done without affecting the architectural integrity of the structure. As a result, complying with PR 445 would not require demolition, destruction, relocation or alteration of a resource or its immediate surrounding such that the significance of a cultural resource would be impaired~~ Any remodeling at existing non-historic residents or facilities would not be a result of PR 445. PR 445 would only prohibit installation of non-PR 445 compliant wood burning devices in existing structures. Since the construction of compliant and non-compliant wood burning devices is assumed to generate similar emissions, PR 445 would not increase potential construction emission impacts if adopted. In addition, reducing PM emissions from wood burning appliances would reduce soot that might disperse from a chimney and impact cultural or historic resources downwind.

V, b), c), & d) PR 445 would not cause any new development. PR 445 would prohibit the installation of wood burning devices in new development. PR 445 would require that any new or used wood burning devices ~~appliances~~ installed in existing structures be clean technologies. ~~PR 445 would require that non-compliant wood burning appliance at commercial facilities be replaced with clean technologies by 2010. PR 445 would require that non-compliant wood burning heaters be replaced or rendered inoperable in transferred real estate in areas with PM2.5 concentrations greater than 20 micrograms per meter cubed beginning in 2012.~~ Non-wood burning and ~~C~~clean burning appliances are expected to be prefabricated and dropped into place at new or existing facilities without the use of heavy construction equipment. The removal of non-compliant appliances is also not expected to require the use of heavy equipment. Therefore, no impacts to historical resources are anticipated to occur as a result of implementing the proposed project. PR 445 is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that the areas where the non-compliant wood burning appliances are used are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed.

Similarly, new residential or commercial operations that may adversely affect cultural resources would be built regardless of whether or not PR 445 is in affect.

Based upon these considerations, significant adverse cultural resources impacts are not expected from the implementing PR 445 and will not be further assessed in this Draft EA. Since no significant cultural resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VI.	**ENERGY.** Would the project:			
a)	Conflict with adopted energy conservation plans?	☐	☐	☑
b)	Result in the need for new or substantially altered power or natural gas utility systems?	☐	☑	☐
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☑	☐
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☑	☐
e)	Comply with existing energy standards?	☐	☐	☑

Significance Criteria

Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:
- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion

PR 445 would reduce particulate matter from wood burning appliances. To reduce PM2.5 emissions from affected equipment, PR 445 would restrict or prohibit the sale, supply, installation or transfer of new or used wood burning appliances, and materials burned in a wood burning appliance~~, and commercial operations of certain wood burning appliance~~s.

VI.a) & e) PR 445 does not require any action which would result in any conflict with an adopted energy conservation plan or violation of any energy conservation standard. PR 445 is not expected to conflict with adopted energy conservation plans because existing facilities would be expected to continue implementing any existing energy conservation plans and any new construction is expected to require building permits through which local jurisdictions would require projects to comply with energy conservation plans. The siting of new facilities and residences is predominantly governed by the local jurisdiction and not within the purview of the SCAQMD. The local jurisdiction or energy utility sets standards (including energy conservation) and zoning guidelines regarding new development and will approve or deny applications for building new facilities. During the local land use permit process, the project proponent may be required by the local jurisdiction or energy utility to undertake a site-specific CEQA analysis to determine the impacts, if any, associated with the siting and construction of new development.

Additionally, affected facilities are expected to comply with existing energy conservation plans and standards to minimize operating costs but still comply with the requirements of PR 445. PR 445 would not promote the installation of wood burning appliances, but would alter the type of wood burning or alternative fueled appliances. PR 445 compliant wood burning appliances are more efficient than non-compliant wood burning devices. Operators who replace wood burning appliances with natural gas or electric appliances would impact petroleum inventories, but would reduce the impact on wood fuel resources. Project construction and operation activities would not utilize non-renewable resources in a wasteful or inefficient manner.

As a result, PR 445 would not conflict with energy conservation plans, use non-renewable resources in a wasteful manner, or result in the need for new or substantially altered power or natural gas systems. Accordingly these impact issues will not be further analyzed in the Draft EA.

VI.b), c) & d) ~~The primary effect of implementing PR 445 is that wood burning appliances would need to be compliant with the proposed rule or the non-compliant device would need to be replaced or rendered inoperable. Staff estimates that 250 commercial facility operators may require wood burning appliance replacements or render the appliances inoperable. If operators replace non-compliant wood burning appliances with compliant wood burning appliances, less wood fuel would be required per a given period of time, because the compliant wood burning appliances are more efficient.~~ PR 445 would prohibit the installation of wood burning devices in new development. PR 445 would also prohibit the installation of permanent non-compliant wood devices in existing structures. It is expected that either natural gas-fueled or electric devices would be installed in place of wood burning devices in new development and non-compliant wood devices in existing structures

Natural Gas Impacts

The range of natural gas usage per unit would be between 20,000 to 60,000 Btu per hour. SCAQMD staff estimates that ~~5,123~~ approximately 17,300 residential natural gas fire places would be built annually (104,247 residential units by 2014) instead of traditional fireplaces in new construction. The Staff Report estimates residences would use ~~0.28 cord~~ approximately 110 pounds per year. Based on this assumption, these new residential wood burning devices ~~appliances~~ would be operated 416,987 hours per year. Natural gas devices ~~appliances~~ are assumed to be operated an equivalent number of hours. Based on this information, an additional

~~447.2~~ 218 million cubic feet of natural gas per year would be needed if devices ~~appliances~~ at all new installations were rated at 60,000 Btu per hour by 2014 (~~7.4~~ 3.7 million cubic feet per day). ~~By 2022, 958.3 million cubic feet of natural gas per year would be needed (15.8 million cubic feet per day)~~

~~The Staff Report estimates commercial facilities would use between one to two cords per year. Based on this assumption, commercial facility wood burning appliances would be operated 840 hours per year. Natural gas appliances are assumed to be operated an equivalent number of hours. If operators at all 250 commercial facilities installed natural gas fueled heaters, an additional 12.4 million cubic feet per year (0.05 million cubic feet per day) would be needed by 2010, which is when this provision is expected to be completed.~~

~~Frequency of property transfers was based on a Chicago Title Company database that identified an average turnover of property ownership to be 10.5 years. The Staff Report estimates that there are 27,414 conventional pre-EPA certified wood heaters located in Riverside and San Bernardino counties. Based on this estimate, if the residential change-out requirements are needed, approximately 341.8 million cubic feet per year natural gas appliances may be required because of real estate transactions (5.64 million cubic feet) by 2022.~~

Table 2-8 ~~2-13~~ presents the maximum natural gas usage by 2014 ~~2022~~, when all requirements of PR 445 would be completed ~~the residential and commercial replacement requirements are expected to be completed. A maximum of 1,312 million cubic feet per year would be need by 2022 (21.5 million cubic feet per day).~~

Table 2-8 ~~2-13~~
Maximum Natural Gas Usage 2008 to 2014 ~~by 2022~~

Description	Number of Units	Maximum Rating, Btu/hr	Usage, MMcft/day	~~Usage, MMcft/year~~
New Units	~~76,845~~ 104,247	60,000	~~15.82~~ 21.5	~~958.3~~
~~Commercial Replacement~~	~~250~~	~~60,000~~	~~0.05~~	~~12.4~~
~~Residential Replacement~~	~~27,410~~	~~60,000~~	~~5.64~~	~~341.8~~
~~**Total**~~			~~**21.5**~~	~~**1,312**~~

Natural gas is supplied by private companies such as Southern California Gas Company (Gas Company) and San Diego Gas and Electric (SDG&E); and municipal utilities such as Long Beach Gas and Electric Department, and Southwest Gas Corporation.

Natural gas is supplied to the majority of the district by the Gas Company. The Gas Company supplies between 1.2 to 3.4 billion cubic feet of natural gas per day. Based on the total of ~~21.5~~ 21.5 million cubic feet per day, natural gas usage would increase by less than one percent, which according to The Gas Company[33], is not considered significant increase in natural gas use; and significant amounts of fuel would not be needed when compared to existing supplies.

[33] Telephone conversation between James Koizumi, SCAQMD, and Richard Barca, Southern California Gas, September 17, 2003.

Based on the small increase in natural gas demand from implementing PR 445, ~~less than one pound,~~ no new or substantially altered power or natural gas utility systems are expected to be needed. Further, PR 445 is not expected to create any significant effects on local or regional natural gas energy supplies and on requirements for additional energy.

Electrical Impacts

Wood burning and natural gas appliances use electricity for ancillary equipment (e.g., fans, motors, etc.). Electric appliances are completely operated by electricity for both ancillary equipment (e.g., fans, motors, etc.) and heat generation.

Electricity Usage from Wood Burning and Natural Gas ~~Appliances~~ Devices

~~Electrical energy impacts associated with ancillary equipment (e.g., fans, motors, etc.) used in conjunction with the heaters will not constitute significant adverse energy impacts. A pellet wood heater draws approximately 0.38 kilowatt-hour/hour of electricity. An EPA certified Phase II fireplace insert draws approximately 0.144 kilowatt-hour/hour of electricity. By 2014, based on 212 hours of operation per year; new residential units would use 2,889 megawatt-hours per year (48 megawatt-hours per day). By 2022, new residential units would use 6,191 megawatt-hours per year (102 megawatt-hours per day). Commercial replacement units would use 76 megawatt-hours per year (0.33 megawatt-hours per day) by 2010, when the commercial replacement provision is expected to be completed. If the residential change-outs are required 27,410 residential replacement units would use 8,475 megawatt-hours annually (139 megawatt-hours per day) by 2022, when the residential replacement provision is expected to be completed. By 2022, PR 445 could require approximately 8,475 megawatt-hours annually (139 megawatt-hours per day). Detailed calculations are presented in Appendix B.~~

SCAQMD staff expects that developers would install either natural gas devices or electric devices. Natural gas devices may need electric starters; however, the electric use from starters is expected to be de minimus.

Electricity Usage from Electric ~~Appliances~~ Devices

A 2,600 Btu per hour electric fireplace would require 1,400 watts. ~~The Staff Report~~ SCAQMD staff estimates that ~~250~~ 146 electric fire places would be installed in place of wood burning appliances per year at new residences. An electric fireplace that generates 2,600 Btu per hour would need 1,400 watts. Therefore, ~~250~~ 146 electric fire places would need ~~0.6~~ 0.4 megawatt-hours per day. By 2014, approximately ~~4.7~~ 2.6 megawatt-hours per day would be required. ~~By 2022, approximately 10 megawatt-hours per day would be needed.~~ Detailed calculations are presented in Appendix B.

Electricity Impacts

According to the Los Angeles Department of Water and Power's (DWP) Draft 2006 Integrated Resource Plan, 23 million megawatt hours of power were sold in 2005 (63,013 MW-hours per day). The ~~149~~ 2.6 megawatts per day ~~(139 megawatt-hours for wood burning and natural gas appliances + 10 megawatt-hours from electric fireplaces)~~ would be less than a fraction of a percent of the 23 million megawatts. DWP is only one of the energy suppliers that would supply affected facilities; DWP alone would be able to accommodate the energy usage. Therefore, the ~~149~~ 2.6 megawatts per day would be less than significant and not considered to be wasteful use of an energy resource.

~~The above natural gas and electricity demand usage overestimates actual impacts because it assumes that all affected facilities and residences would comply by using natural gas appliances or electrical appliances.~~ ~~In actuality, facilities and residences may use compliant wood burning appliances or render their appliances inoperable.~~

Based upon the above considerations, the proposed project is not expected to use energy in a wasteful manner, would not substantially deplete energy resources.

Based upon the preceding analysis, it is not expected that PR 445 would create any significant effects on peak and base period demands for electricity and other forms of energy ~~since only minor construction activities (installing or replacing appliances, or rendering appliances inoperable) are anticipated as a result of facilities~~ in complying PR 445.

Therefore, PR 445 is not expected to generate significant adverse energy resources impacts and will not be discussed further in this Draft EA. Since no significant energy impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
VII.	**GEOLOGY AND SOILS.** Would the project:			
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☑
	• 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?	☐	☐	☑
	• Strong seismic ground shaking?	☐	☐	☑
	• Seismic–related ground failure, including liquefaction?	☐	☐	☑
	• Landslides?	☐	☐	☑
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
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 on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑
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?	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☑

Significance Criteria

Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion

PR 445 would reduce particulate matter from wood burning appliances. To reduce PM2.5 emissions from affected equipment, PR 445 would restrict or prohibit the sale, supply, installation or transfer of new or used wood burning appliances, and materials burned in a wood burning appliance~~, and commercial operations of certain wood burning appliance~~s.

VII.a) Southern California is an area of known seismic activity. Structures must be designed to comply with the Uniform Building Code Zone 4 requirements if they are located in a seismically active area. The local city or county is responsible for assuring that a 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.

Accordingly, buildings and equipment at existing affected facilities are required to conform to the Uniform Building Code and all other applicable state and local codes in effect at the time they were constructed. PR 445 would require that ~~if~~ non-wood burning devices ~~are~~ installed in new construction~~, that compliant wood burning devices be used~~. ~~Commercial facility operators are required to operate compliant wood burning devices by 2010. Beginning in 2012, in areas where the PM2.5 concentrations are greater than 20 micrograms per cubic meters, all wood burning heaters in residential property transferred would be required to be compliant wood burning heaters.~~ As already noted PR 445 does not require or promote construction of residential or commercial land use projects. However, the removal and installation of wood burning devices during remodeling would likely require a building permit. Therefore, it is expected that wood burning devices ~~appliances~~ or alternative fueled devices ~~appliances~~ would be installed according to all applicable state and local codes. As a result, substantial exposure of people or structure to the risk of loss, injury, or death involving seismic-related activities is not anticipated as a result of installing compliant devices ~~appliances~~ and will not be further analyzed in this Draft EA.

VII.b) ~~PR 445 will require installation of compliant wood burning appliances. Operators at 250 affected commercial facilities may replace wood burning appliances. A contingency requirement may necessitate the replacement of 27,414 residential wood burning heaters as homes are sold beginning in 2012. It is expected that wood burning appliances can be removed and installed without heavy equipment within existing paved areas at the existing commercial facilities and residences.~~

PR 445 would not require new development. PR 445 would prohibit the installation of wood burning devices in new development. PR 445 would ~~only~~ require that any new or use wood burning devices installed in existing residences or facilities are ~~be~~ compliant devices. There would be no difference in impact to soils from installing a non-compliant versus ~~compliant wood burning device appliance or~~ alterative fuel device ~~appliance~~, as new development in the district would continue to be subject to Rule 403-Fugitive Dust. Compliance with Rule 403 would minimize loss of top soil during construction.

Installing compliant appliances in existing residences and commercial operation does not require heavy construction that would disturb soil as compliant appliances are drop in units. Therefore, no soil disruption from excavation, grading, or filling activities; changes in topography or surface relief features; erosion of beach sand; or changes in existing siltation rates are anticipated from the implementation of PR 445.

VII.c) & d) Since PR 445 would primarily affect ~~existing~~ new commercial facilities and residential units, it is expected that the soil types present at the affected facilities and residences would not be further susceptible to expansive soils or liquefaction, because of non-wood burning devices. Furthermore, subsidence is not anticipated to be a problem since ~~no~~ excavation, grading, or filling activities will occur at ~~existing~~ affected facilities or residences for reasons other than PR 445, and PR 445 would only prohibit the installation of wood burning devices.

PR 445 would not require or promote new development. At new facilities or residences the installation of ~~compliant wood burning appliances or~~ alterative fueled devices ~~appliances~~ would be the same as installing non-compliant wood burning devices ~~appliances~~. Therefore, installing alternatively fueled devices ~~compliant wood burning appliances~~ in at new facilities would not generate any additional impacts. Further, the proposed project does not involve drilling or removal of underground products (e.g., water, crude oil, et cetera) that could produce subsidence effects. Additionally, alternatively fueled devices ~~compliant appliances~~ installed in new development have no effect on the potential for landsides, lateral spreading subsidence, etc. The new development, not compliance with PR 445, will be required to undergo a CEQA analysis, which will evaluate potential geological or soil impacts. If significant geological and soil impacts are identified for the new project, mitigation measures must be identified.

PR 445 would not require new development. PR 445 would prohibit the installation of wood burning devices in new development. PR 445 would ~~only~~ require that any new or used wood burning appliances installed in existing structures be compliant devices. Wood burning systems do not have liquid waste that would need treatment. There would be no difference in impact to soils from installing a non-compliant verse compliant wood burning appliance or alterative fuel appliance. Therefore, PR 445 would not significantly impact soils.

VII.e) The proposed project does not require or involve the installation of septic tanks or alternative wastewater disposal systems. Therefore, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

Based on the above discussion, the proposed project is not expected to have an adverse impact on geology or soils. Since no significant adverse impacts are anticipated, this environmental topic will not be further analyzed in the draft EA. No mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:			
a)	Create a significant hazard to the public or the environment through the routine transport, use, disposal of hazardous materials?	☐	☑	☐
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?	☐	☑	☐
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☑	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☐	☑
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
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?	☐	☐	☑
i)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑

Significance Criteria

Impacts associated with hazards will be considered significant if any of the following occur:
- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

PR 445 would reduce particulate matter from wood burning appliances. To reduce PM2.5 emissions from affected equipment, PR 445 would restrict or prohibit the sale, supply, installation or transfer of new or used wood burning appliances, and materials burned in a wood burning appliance~~, and commercial operations of certain wood burning appliance~~s.

VIII.a & b) PR 445 compliant wood burning appliances that burn wood, do not require the routine transport, use, or disposal of hazardous materials because wood and wood ash are not characterized as hazardous material. Nor would the prohibition against wood burning devices at new facilities or the requirement allowing only the installation of compliant wood burning devices ~~appliances~~ in existing structures create a significant hazard to the public or environment through a reasonable foreseeable upset and accident conditions involving hazardous materials into the environmental. The use of electrical heaters as an alternative to wood burning devices ~~appliances~~ would also not involve the use of hazardous materials and, therefore, would not generate significant impacts.

The operation of natural gas devices ~~appliances~~ would introduce greater explosive risk than wood burning appliances. However, most commercial facilities and residences in the district have existing natural gas service (see Table 2-6~~ 2-5~~). Natural gas is flammable and explosive under certain conditions. A release of natural gas may result in significant hazards and risk of upset to people. However, most existing affected facilities already have natural gas pipeline infrastructure for natural gas delivery. In general, the installation of natural gas-fueled wood burning appliances replacements would require a building permit. Natural gas devices

~~appliances~~ have to adhere to ANSI standards (Z21.11, Z21.44, and Z21.50). With adherence to the applicable federal, state and local regulatory requirements for the design and installation of natural gas devices ~~appliances~~, the risk of accidental release is anticipated to be less than significant.

Propane is not expected to be an option to fuel wood burning replacement devices ~~appliances~~ within facilities or residences. Propane may be used to fuel wood burning replacement devices ~~appliances~~ outside of facilities or residences. Propane would be expected to be used in smaller devices ~~appliances~~ or in areas where natural gas services is not available. Propane is expected to be used in smaller devices ~~appliances~~, because larger devices ~~appliances~~ would more likely be fueled by natural gas service. In places where natural gas service is not available, it is expected that propane would currently be used for other devices ~~appliances~~ are; therefore, the addition of a wood burning devices ~~appliances~~ replacement would not likely increase the consequences of an explosive risk. In this situation, the existing propane tank would drive the explosive risk. Like natural gas devices ~~appliances~~, the installation of propane devices ~~appliances~~ would require building permits. With adherence to the applicable federal, state and local regulatory requirements for the design and installation of propane devices ~~appliances~~, the risk of accidental release is anticipated to be less than significant.

VIII.c) PR 445 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 in existing and alternative fueled appliances in new ~~or existing~~ facilities would generate less hazardous emissions that non-compliant wood burning devices ~~appliances~~. Replacement of wood burning devices ~~appliances~~ with electric appliances would eliminate any hazardous emissions or materials. Section VIII.a) & b) includes a discussion on health risk from air emissions and concludes that PR 445 would reduce health risk through the installation and replacement of non-compliant wood burning devices ~~appliances~~ with compliant wood burning devices ~~appliances~~ or alternative clean-fuel burning devices ~~appliances~~.

Replacement of wood burning devices ~~appliances~~ with natural gas or propane devices ~~appliances~~ would increase explosive risk. However, since natural gas or propane devices ~~appliances~~ would require building permits. With adherence to the applicable federal, state and local regulatory requirements for the design and installation of natural gas or propane devices ~~appliances~~, the risk of accidental release is anticipated to be less than significant. Therefore, PR 445 would not significantly impact schools.

VIII.d) PR 445 would ~~affect~~ prohibit the installation of wood burning devices ~~appliances~~ at new commercial facilities and residences. . Government Code §65962.5 is related to hazardous material sites at industrial facilities. PR 445 would affect residences and commercial facilities such as hotels, restaurants, lodges, etc., that 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, PR 445 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

VIII.c) e) & f) PR 445 would not result in a safety hazard for people residing or working within two miles of an public airport or public use airport, or air strip. The use of compliant wood burning and alternative fueled devices ~~appliances~~ in new or existing facilities would generate

less hazardous emissions that non-compliant wood burning devices ~~appliances~~. Replacement of wood burning devices ~~appliances~~ with electric devices ~~appliances~~ would eliminate any hazardous emissions or materials. Section VIII.a) & b) includes a discussion on health risk from air emissions and concludes that PR 445 would reduce health risk through the installation and replacement of non-compliant wood burning devices ~~appliances~~ with compliant wood burning devices ~~appliances~~ or alternative clean-fuel burning devices ~~appliances~~.

The construction of compliant wood burning devices ~~appliances~~ is similar to non-compliant wood burning devices. Electric devices ~~appliances~~ do not have stacks. Natural gas devices ~~appliances~~ are typically not required to have stacks as tall as wood burning devices ~~appliances~~. Therefore, PR 445 is not expected to increase the height of chimneys, stacks or vents that would affect air traffic. The reduction in PM emissions should benefit visibility.

Replacement of wood burning devices ~~appliances~~ with natural gas or propane devices ~~appliances~~ would increase explosive risk. However, since natural gas or propane appliances would require building permits. With adherence to the applicable federal, state and local regulatory requirements for the design and installation of natural gas or propane appliances, the risk of accidental release is anticipated to be less than significant. Therefore, PR 445 would not significantly impact public airports or private air strips

VIII.g) PR 445 would affect wood burning devices ~~appliances~~ at commercial facilities and residences. Wood burning devices ~~appliances~~ or their replacements are not typically large elements of an emergency response or evacuation plan. It is not expected that the addition or replacement of a wood burning devices ~~appliances~~ would alter any elements of an emergency response or evacuation plan. However, if complying with PR 445 requires changes to the emergency response or evacuation plan, changes would be minor, so emergency response plans could be easily updated. Therefore, PR 445 is not expected to significantly impact emergency response or evacuation plans.

VIII.h) PR 445 would ~~require~~ prohibit new development from installing wood burning devices and existing developments from installing non-compliant devices ~~housing projects to include compliant appliances after January 1, 2008, and all commercial operation must replace non-compliant appliances by January 1, 2010~~. As already noted PR 445 does not require or induce construction of new residential or commercial land use projects. Such projects are built for reasons unrelated to PR 445. New land use projects would require a CEQA analysis that would evaluate risks from wildland fires. If such risk impacts are concluded to be significant measures to mitigate impacts to the maximum extent feasible would be required.

VIII.i) PR 445 would reduce the fire hazard. PR 445 compliant wood burning and alternative fueled appliances are more efficient and have better control over combustion. With adherence to the applicable federal, state and local regulatory requirements for the design and installation of natural gas or propane devices ~~appliances~~, the risk of accidental release is anticipated to be less than significant. Therefore, PR 445 would reduce the risk of fire hazard in general and specifically in areas with flammable materials. PR 445 would not expose people or structures to significant risk of loss, injury or death involving wildland fires.

In conclusion, potentially significant adverse hazard impacts resulting from adopting and implementing PR 445 are not expected and will not be considered further.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IX.	**HYDROLOGY AND WATER QUALITY.** Would the project:			
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☑
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be 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 which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through 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 on- or offsite?	☐	☐	☑
d)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑
e)	Otherwise substantially degrade water quality?	☐	☐	☑
f)	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?	☐	☐	☑
g)	Place within a 100-year flood hazard area structures which would impede or redirect flood flaws?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
h)	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?	☐	☐	☑
i)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☑
j)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑
k)	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?	☐	☐	☑
l)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
m)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑
n)	Require in a determination by the wastewater treatment provider which 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?	☐	☐	☑

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.

- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand:
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than five million gallons per day.

Discussion

IX.a), e), f), j), k), & l) PR 445 would prohibit the installation of wood burning devices in new developments. PR 445 would require installation of only compliant wood burning devices ~~appliances~~ in existing ~~and new~~ residences and commercial operations. PR 445 has no provision that would require the use of water or the disposal of wastewater, because compliant devices ~~appliances~~ do not use water for any reason. Therefore, PR 445 would not cause the construction of additional water resource facilities, the need for new or expanded water entitlements, or an alteration of drainage patterns. Since it does not require water, the project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

Wood burning and alternatively fueled devices ~~appliances~~ do not generate wastewater and, therefore, would not create or contribute to runoff water. Most wood burning and alternatively fueled devices ~~appliances~~ are housed within structures that would protect them from exposure to and contaminating stormwater. Compliant wood burning and alternatively fueled devices ~~appliances~~ that are used outdoors are typically protected from weather, especially rain and would not be expected to contaminate stormwater in any way. Since both compliant and non-compliant wood burning and alternatively fueled devices ~~appliances~~ are typically enclosed systems (both stoves and inserts have doors), wood burning and alternatively fueled devices ~~appliances~~ are not expected to contaminate rainwater. Therefore, PR 445 would not 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.

In addition, the proposed rule is not expected to require additional wastewater disposal capacity, violate any water quality standard or wastewater discharge requirements, or otherwise substantially degrade water quality.

IX.b), & n) PR 445 is not expected to substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. PR 445 will not increase demand for water from existing entitlements and resources, and will not require new or expanded entitlements because compliant devices do not use water for any reason. Therefore, no water demand impacts are expected as the result of implementing the proposed amendments.

IX.c) & d) PR 445 may include minor construction activities (installation of only compliant wood burning appliances in existing developments~~, replacement of wood burning appliances, or~~

~~rendering existing wood burning appliances inoperable~~) within ~~new or~~ existing affected facilities, installation of compliant devices ~~appliances~~ does not require heavy construction equipment so not soil disturbance would occur as a results of implementing PR 445. As result, no changes to storm water runoff, drainage patterns, groundwater characteristics, or flow are expected. Therefore, potential adverse impacts to drainage patterns, etc., are not expected as a result of implementing PR 445.

IX.g), h) & i) The project will not require or induce construction of new housing or contribute to the construction of new building structures ~~other than installation, replacement or rendering existing appliances inoperable within new or existing affected facilities~~. Therefore, PR 445 is not expected to generate construction of any new structures in 100-year flood areas as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map. As a result, PR 445 is not expected to expose people or structures to new significant flooding risks. Installation of compliant appliances in existing affected facilities will not affect any existing risks from flood, inundation, etc. Consequently, PR 445 will not affect in any way any potential flood hazards inundation by seiche, tsunami, or mud flow that may already exist relative to existing facilities.

IX.m) PR 445 will not increase demand ~~for~~ water supplies, since ~~only minor~~ PR 445 would not require any construction activities ~~(installation, replacement or rendering appliances inoperable)~~ ~~are expected to occur within affected facilities~~. Similarly, compliant devices ~~appliances~~ do not use water for any purpose; therefore, no storm water discharge supply facilities or modifications to existing facilities would be required due to the implementation of PR 445. Accordingly, PR 455 is not expected to generate significant adverse impacts relative to construction of new storm water drainage facilities.

Based upon the above considerations, significant hydrology and water quality impacts are not expected from the implementation of PR 445 and will not be further analyzed in this Draft EA. Since no significant hydrology and water quality impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
X.	**LAND USE AND PLANNING.** Would the project:			
a)	Physically divide an established community?	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Conflict with any applicable habitat conservation or natural community conservation plan?	☐	☐	☑

Significance Criteria
Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

Discussion

X.a) ~~The proposed project would require installation of compliant appliances in existing and new affected facilities.~~ PR 445 does not require any new development, but would ~~require~~ prohibit installation of ~~compliant appliances installed~~ wood burning devices in new development. At existing residencies or facilities, PR 445 would impact the ~~use~~ installation of wood burning devices ~~appliances~~ within the boundaries of the existing residencies or facilities. Therefore, PR 445 does not include any components that would require physically dividing an established community.

X.b) & c) There are no provisions in PR 445 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by regulating PM10 and PM 2.5 emissions from wood burning devices ~~appliances~~. Therefore, PR 445 would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities. Therefore, present or planned land uses in the region will not be significantly adversely affected as a result of the proposed rule

Based upon these considerations, significant land use and planning impacts are not expected from the implementation of PR 445 and will not be further analyzed in this Draft EA. Since no significant land use and planning impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XI. 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?	☐	☐	☑
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?	☐	☐	☑

Significance Criteria

Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

- The project 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.
- The proposed project results 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.

Discussion

XI.a) & b) There are no provisions in PR 445 that would result in the loss of availability of a known mineral resource 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 because compliant appliances typically do not require mineral resources such as sand, gravel, etc..

Based upon the above considerations, significant mineral resources impacts are not expected from the implementation of PR 445 and will not be further analyzed in this Draft EA. Since no significant mineral resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:			
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑
f)	For a project within the vicinity of a private airship, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑

Significance Criteria

Impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII.a) PR 445 would prohibit the installation of wood burning devices in ~~require installation of appliances in existing and~~ new affected facilities. PR 445 would prohibit the installation of new or used non-compliant wood burning devices in existing structures. Since installation or replacement of wood burning appliances is expected to be comprised of pre-fabricated equipment that would not require heavy duty construction equipment, noise impacts during replacement would be minimal. Operation of compliant wood burning appliances in some cases may require the installation of blowers or exhaust fans similar, in some respects to those used for house hold water heaters. The blowers and exhaust fans would be installed under a building permit. Since building codes typically include set backs for blowers and exhaust systems from the property line and the blowers and fans are relatively small, noise from these systems indoors and outdoors are expected to be limited to acceptable levels by the building permit process. Thus, the proposed project is not expected to expose persons to the generation of excessive noise levels above current facility/residential levels. It is expected that any facility/residence affected by PR 445 will comply with all existing local noise control laws or ordinances.

In commercial environments Occupational Safety and Health Administration (OSHA) and California-OSHA have established noise standards to protect worker health. It is expected that operators at affected facilities/residences will continue complying with applicable noise standards, which would limit noise impacts to workers, patrons and neighbors.

XII.b) PR 445 is not anticipated to expose people to or generate excessive groundborne vibration or groundborne noise levels since only minor construction activities (installation or replacement of wood burning devices during remodeling) are expected to occur at the existing residences or facilities and compliant appliances are not expected to involve, in any way, equipment that generates vibrations.

XII.c) A permanent increase in ambient noise levels at the affected facilities above existing levels as a result of implementing the proposed project is unlikely to occur because for most affected facilities similar equipment would be installed as part of implementing PR 445. The existing noise levels are unlikely to change and raise ambient noise levels in the vicinities of the existing facilities to above a level of significance, because neither non-compliant nor compliant appliances generate high noise levels because they are intended for use in residences and commercial facilities (e.g., hotels, restaurants, etc.), where operators and patrons will not tolerate excessive noise levels.

XII.d) No increase in periodic or temporary ambient noise levels in the vicinity of affected facilities above levels existing prior to PR 445 is anticipated because the proposed project would require only minor construction (installation or replacement of appliances) activities that would not require heavy equipment. As indicated earlier, operational noise levels are expected to be equivalent to existing noise levels.

XII.e) & f) Implementation of PR 445 would generally consist of improvements within the existing facilities and a prohibition against wood burning devices in new development. Minor construction may be required to install or replace devices ~~appliances~~ during remodels. Even if an affected residence or facility is located near a public/private airport, there are no new noise

impacts expected from any of the existing facilities, ether during construction or operation, as a result of complying with the proposed project. Thus, PR 445 is not expected to expose people residing or working in the vicinities of public airports to excessive noise levels.

Based upon these considerations, significant noise impacts are not expected from the implementation of PR 445 and are not further evaluated in this Draft EA. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a)	Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☑
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:
- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion

XIII.a) The proposed project is not anticipated to generate any significant effects, either direct or indirect, on the district's population or population distribution as no additional workers are anticipated to be required to comply with the proposed amendments. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing PR 445. It is expected that any construction activities at affected facilities would use construction workers

from the local labor pool in southern California. As such, PR 445 will not result in changes in population densities or induce significant growth in population.

XIII.b) & c) Because the proposed project affects wood burning appliances at commercial facilities and residences, PR 445 is not expected to result in the creation of any industry that would affect population growth, directly or indirectly, induce the construction of single- or multiple-family units, or require the displacement of people elsewhere.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of PR 445 and are not further evaluated in this Draft EA. Since no significant population and housing impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government 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:			
a) Fire protection?	☐	☐	☑
b) Police protection?	☐	☐	☑
c) Schools?	☐	☐	☑
d) Parks?	☐	☐	☑
e) Other public facilities?	☐	☐	☑

Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion

XIV.a) & b) The installation or replacement of non-compliant wood burning appliances with compliant wood burning appliances during remodels or alternative fueled appliances in new development is not expected to change to would increase the chances for fires or explosions requiring a response from local fire departments. As shown in the Section VIII - Hazards and Hazardous Material section of this Draft EA, the use of compliant wood burning appliances or alternative fueled appliances is not expected to generate significant explosion or fire hazard impacts. PR 445 is not expected to have any adverse effects on local police departments for the following reasons. Police would be required to respond to accidental releases of hazardous materials during transport. Since hazards impacts from implementing PR 445 were concluded to be less than significant, potential impacts to local police departments are also expected to be less than significant.

XIV.c) & d) As indicated in discussion under item XIII. Population and Housing, implementing PR 445 would not induce population growth or dispersion during either construction or operation. 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.

XIV.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 and, as a result of implementing; therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of PR 445 and are not further evaluated in this Draft EA. Since no significant public services impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XV. RECREATION.				
a)	Would the project 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?	☐	☐	☑
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:
- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion

XV.a) & b) As discussed under "Land Use and Planning" above, there are no provisions in the PR 445 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the changes proposed in PR 445. The proposed project 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 expansion of existing recreational facilities that might have an adverse physical effect on the environment because it will not directly or indirectly increase or redistribute population.

Based upon these considerations, significant recreation impacts are not expected from the implementation of PR 445 and are not further evaluated in this Draft EA. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVI. SOLID/HAZARDOUS WASTE. Would the project:			
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑

Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion

XVI.a) Existing wood burning appliances are not expected to be classified as hazardous waste. Therefore, the disposal of existing devices is expected to be categorized as solid waste. Solid waste is either recycled or disposed of in landfills.

~~The Final Program Environmental Impact Report for the 2003 AQMP states that the daily landfill capacity for Los Angeles, Orange, Riverside and San Bernardino Counties is 101,344 tons per day (Table 3.5-1, page 3.5-2). In a worst-case scenario, it is estimated that as much as, 2,900 tons of the material from the replacement of non-compliant wood burning systems would eventually be sent to landfills (26 tons between 2007 and 2010 from commercial wood burning appliances, and 2,800 tons between 2012 and 2022 from residential wood burning heaters). Since cities and landfills are required to divert recyclable material to recycling center a large amount of the recyclable metal in replaced inserts and stoves should get recycled. The total waste from PR 445 would be about three percent of the total daily capacity. Therefore, the increase in solid waste that would be generated from the proposed project is less than significant.~~

PR 445 is not expected to generate any increase in solid waste. Since any residences and facilities would be replacing their non-compliant wood burning devices because of a remodel, not be cause of PR 445, the removal of the non-compliant wood burning device is attributed to the remodel not PR 445. PR 445 would only require that a compliant wood burning device is installed in place of the non-compliant wood burning device removed.

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-PR 445 compliant devices. In fact, natural gas burning devices would not generate solid waste. Therefore, the increase in solid waste that would be generated from the proposed project is less than significant.

XVI.b) Replacing wood burning appliances in existing structures would require building permits. Most cities have solid and hazardous waste disposal requirements as part of the building permit process. Many cities require that scrap metal be recycled. In addition, because of the value of scrap metal, contractors will recycle scrap metal. With adherence to the applicable federal, state and local regulatory requirements for the disposal of solid waste is expected to occur through the building permit process.

Based on these considerations, PR 445 is not expected to significantly increase the volume of solid or hazardous wastes disposed at existing municipal or hazardous waste disposal facilities or require additional waste disposal capacity. Further, implementing PR 445 is not expected to interfere with any affected facility's ability to comply with applicable local, state, or federal waste disposal regulations. Since no solid/hazardous waste impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION/TRAFFIC. Would the project:			
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☑
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☑
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?	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☑
e) Result in inadequate emergency access or?	☐	☐	☑
f) Result in inadequate parking capacity?	☐	☐	☑
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☑

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day
- Increase customer traffic by more than 700 visits per day.

Discussion

XVII.a) & b) Proposed Rule 445 would reduce PM10 and PM2.5 emissions from wood burning appliances and has no potential to adversely affect transportation. PR 445 would prohibit wood burning devices in new development. No change in transportation is expected by the installation of non-wood burning devices in new development is expected.

PR 445 would prohibit the installation of non-compliant wood burning devices to be installed in existing structures. The installation of compliant devices is not expected to alter transportation.

~~There could be at least two diesel-fueled vehicle round trips (one to remove non-compliant wood burning appliances and deliver compliant wood burning or alternative fuel burning appliances) per affected facility before 2010. In addition, two worker round gasoline fueled vehicle trips would be required (one for removal and one for installation). Between rule adoption and 2010, approximately 250 commercial facilities may need to replace existing wood burning appliances. After 2012, approximately 27,414 residences over 10 years may need to replace wood burning heaters during property transfer. This number of trips is not expected to add to traffic congestion because the trips would be dispersed over time (would not occur at the same date or time) and area. The propose rule would not change or cause additional operational transportation demands or services. Therefore, since two diesel fueled truck trips and two gasoline truck construction-related trips and no additional operational-related trips are anticipated (see Section III – Air Quality for details), the implementation of PR 445 is not expected to significantly adversely affect circulation patterns on local roadways or the level of service at intersections near affected facilities.~~

XVII.c) PR 445 would prohibit wood burning devices in new development. PR 445 would require the installation of compliant wood burning or alternative fueled appliances. PR 445 would prohibit the installation of non-compliant wood burning devices to be installed in existing structures. The stack heights for compliant wood burning or alternative fueled appliances are not expected to be significantly higher than the roof. In addition, stack heights for compliant appliances are typically not as high as for non-compliant appliances. Since building permits would be required to install or replace compliant devices, the building permit process should prevent stacks from adversely affect air traffic patterns. Further, PR 445 will not affect in any way air traffic in the region because wood burning devices ~~appliances~~ are not expected to be transported by plane to any appreciable extent.

XVII.d) Since PR 445 affects wood burning devices ~~appliances~~, no offsite modifications to roadways are anticipated for the proposed project that would result in an additional design hazard or incompatible uses.

XVII.e) Since PR 445 affects wood burning devices ~~appliances~~, no changes are expected to emergency access at or in the vicinity of the affected facilities. The proposed project is not expected to adversely impact emergency access because it primarily requires replacement of non-compliant appliances with compliant appliances.

XVII.f) Since PR 445 affects wood burning appliances, no changes are expected to the parking capacity at or in the vicinity of the affected facilities. PR 445 is not expected to require additional workers, so additional parking capacity will not be required. Therefore, the project is not expected to adversely impact on- or off-site parking capacity.

XVII.g) Since PR 445 affects wood burning appliances, the implementation of PR 445 would not result in conflicts with alternative transportation, such as bus turnouts, bicycle racks, et cetera.

Based upon these considerations, PR 445 is not expected to generate significant adverse transportation/traffic impacts and, therefore, this topic will not be considered further. Since no significant transportation/traffic impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XVIII.	**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?	☐	☐	☑
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)	☐	☐	☑

	Potentially Significant Impact	Less Than Significant Impact	No Impact
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐

XVIII.a) As discussed in the "Biological Resources" section, PR 445 is not expected to significantly adversely affect plant or animal species or the habitat on which they rely because PR 445 is expected to affect equipment or processes located at new and existing residential or commercial facilities, which are typically areas that have already been greatly disturbed and that currently do not support such habitats. Additionally, PR 445 does not require or induce construction of any new land use projects that could affect biological resources. Construction of new land use projects would be done for reasons unrelated to PR 445

XVIII.b) Based on the foregoing analyses, since PR 445 will not generate any project-specific significant environmental impacts, PR 445 is not expected to cause cumulative impacts in conjunction with other projects that may occur concurrently with or subsequent to the proposed project. Related projects to the currently proposed project include existing and proposed rules and regulations, as well as AQMP control measures. Furthermore, because PR 445 does not generate project-specific impacts, cumulative impacts are not consider to be "cumulatively considerable" as defined by CEQA guidelines §15065(a)(3). For example, the environmental topics checked 'No Impact' (e.g., aesthetics, agriculture 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, and transportation and traffic) would not be expected to make any contribution to potential cumulative impacts whatsoever. For the environmental topic checked 'Less than Significant Impact' (e.g., air quality, energy, solid/hazardous waste), the analysis indicated that project impacts would not exceed any project-specific significance thresholds. This conclusion is based on the fact that the analyses for each of these environmental areas concluded that the incremental effects of the proposed project would be minor and, therefore, not considered to be cumulatively considerable. Also, in the case of air quality impacts, the net effect of implementing the proposed project with other proposed rules and regulations, and AQMP control measures is an overall reduction in district-wide emissions contributing to the attainment of state and national ambient air quality standards. GHG emissions are considered cumulative impacts, and PR 445 GHG emissions are below the 10,000 metric ton per year Market Advisory Committee threshold, 25,000 metric ton per year CARB proposed mandatory reporting threshold under AB 32, a small percentage of the total statewide GHG inventory in 2014, and, with other control measures in the 2007 AQMP, which is a comprehensive ongoing regulatory program that would reduce overall CO2 emissions; cumulative GHG adverse impacts from PAR 445 are not considered significant. Therefore, it is concluded that PR 445 has no potential for significant cumulative or cumulatively considerable impacts in any environmental areas.

XVIII.c) Based on the foregoing analyses, PR 445 is not expected to cause significant adverse effects on human beings. Significant adverse air quality impacts are not expected from the

implementation of PR 445. Based on the preceding analyses, no significant adverse impacts to aesthetics, agriculture resources, biological resources, cultural resources, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, solid/hazardous waste and transportation and traffic are expected as a result of the implementation of PR 445.

As discussed in items I through XVIII above, the proposed project has no potential to cause significant adverse environmental effects.

APPENDIX A

PROPOSED RULE 445

Proposed Rule 445

In order to save space and avoid repetition, please refer to the latest version of proposed Rule 445 located elsewhere in the rule amendment package. The version "PR 445 January 19, 2007" of the proposed rule was circulated with the Draft Environmental Assessment that was released on February 9, 2007 for a 30-day public review and comment period ending March 13, 2007.

Original hard copies of the Draft Environmental Assessment, which include the version "PR 445 January 19, 2007" of the proposed rule, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

WOOD BURNING APPLIANCE EMISSION INVENTORY AND WOOD BURNING PROHIBITION REDUCTIONS

Estimation of 2008 Criteria Pollution Inventory from ARB 2002 and 2014 Criteria Emissions Inventory

EIC	EICSOU	POLLUTANT	ARB Inventory 2002	ARB Inventory 2014	Interpolated Inventory 2008
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	PM10	2.1663	2.1663	2.1663
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	PM10	3.8141	4.5469	4.1805
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	NOX	0.1964	0.1964	0.1964
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	NOX	0.3061	0.3648	0.33545
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	PM2_5	2.0855	2.0855	2.0855
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	PM2_5	3.6717	4.3771	4.0244
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	SOX	0.0277	0.0277	0.0277
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	SOX	0.0474	0.0566	0.052
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	ROG	1.0116	1.0116	1.0116
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	ROG	1.6025	1.9104	1.75645
610-600-0230-0000	600-WOOD COMBUSTION - WOOD STOVES	COT	13.8398	13.8398	13.8398
610-602-0230-0000	602-WOOD COMBUSTION - FIREPLACES	COT	29.7806	35.5028	32.6417

ARB Inventory 2002 from 8-Hour Ozone SIP Emission Inventory Projections: Preliminary Draft (http://www.arb.ca.gov/app/emsinv/o3sip/)
Interpolated Inventory 2008 estimated by linear interpolation from 2002 and 2014 criteria emission inventory.

Summary of Annual Average Day Emissions from Fireplaces and Firestoves (tons)

Pollutant	2002, ton/day	2014, ton/day	Interpolated 2008, ton/day	2008-2014 Growth, ton/day	2008-2014 90% Growth, ton/day	2008-2014 90% Growth, lb/day
PM10	5.98	6.713	6.35	0.37	0.33	660
NOX	0.50	0.561	0.53	0.03	0.03	53
PM2.5	5.76	6.463	6.11	0.35	0.32	635
SOX	0.08	0.084	0.08	0.00	0.00	8.3
ROG	2.61	2.922	2.77	0.15	0.14	277
CO	43.62	49.343	46.48	2.86	2.57	5,150

2008-2014 growth, ton/day = 2014 Emissions Inventory - 2008 Emissions Inventory
2008-2014 90% growth, ton/day = 2008-2014 growth, ton/day x 0.9. Ten percent of the growth was assumed to be exempt from PR 445.

Summary of Winter Day Emissions from Fireplaces and Firestoves

Pollutant	ARB Emissions Inventory 2014	2008-2014 90% Growth	2014 Annual Avg Day Emissions Inventory, ton/year	Winter Day Emission, ton/winter day	Annual Emission Reductions from Curtailment Program, ton/year)	Annual Average Daily Emission Reductions from Curtailment Program, ton/day	Annual Average Daily Emission Reductions from Curtailment Program (lb/day)
PM10	6.7	0.33	6.37	13.4	251	0.69	1,374
NOX	0.6	0.03	0.57	1.2	23	0.062	124
PM2.5	6.5	0.32	6.18	13.0	243	0.67	1,333
SOX	0.1	0.00	0.10	0.2	3.8	0.01	21
ROG	2.9	0.14	2.76	5.8	109	0.30	595
CO	49.3	2.57	46.73	98.1	1839	5.04	10,075

2014 Annual Avg Day Emissions Inventory, ton/year = 2014 Emissions Inventory - 2008-2014 90% growth, ton/day
Winter Day Emission, ton/winter day =(2014 Annual Avg Day Emissions Inventory, ton/year)/(365 day/year) x (69% emissions occurring in winter months)/(120 winter day per year).
Annual Emission Reductions from Curtailment Program, ton/year = Winter Day Emission, ton/winter day x 25 curtailment day/year x 75% compliance rate.
Annual Average Daily Emission Reductions from Curtailment Program, ton/day = (Annual Emission Reductions from Curtailment Program, ton/year)/(365 day/year)
Annual Average Daily Emission Reductions from Curtailment Program, lb/day = Annual Average Daily Emission Reductions from Curtailment Program, ton/day x 2,000 lb/ton)

2007 AQMP Wood Burning Household Estimates

COUNTY	L.A.	ORANGE	RIVERSIDE	S.B.	TOTAL
2008	4,825	2,812	3,572	3,400	**14,608**
2009	4,863	2,841	3,668	3,456	**14,828**
2010	4,901	2,872	3,768	3,512	**15,052**
2011	6,148	1,038	3,477	3,944	**14,606**
2012	6,207	1,042	3,561	4,015	**14,826**
2013	6,268	1,046	3,648AQM	4,088	**15,049**
2014	6,328	1,050	3,736	4,162	**15,277**
Totals	**39,540**	**12,702**	**25,429**	**26,577**	**104,247**

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2008

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2008	4,343	2,530	3,214	3,060	14,608

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2008	3,909	434	2,404	127	2,571	643	590	2,470	13,147
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	1.5	2.7	0.9	0.8	1.0	3.9	0.2	15.1	26.1
Fireplace Fire Events 2008	8,460	15,037	5,203	4,385	5,566	22,266	1,277	85,535	147,729

Wood Burned, lb/year = 2007 AQMP number of households 2008 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2008 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2008 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2008 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	190	198	1,043	2,451	16	143

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2009

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2009	4,377	2,557	3,301	3,110	14,608

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2009	3,939	438	2,429	128	2,641	660	600	2,510	13,345
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	1	1	1	4	0	15	27
Fireplace Fire Events 2009	8,526	15,155	5,258	4,432	5,717	22,869	1,298	86,938	150,192

Wood Burned, lb/year = 2007 AQMP number of households 2008 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2009 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2009 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2009 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	193	201	1,060	2,491	16	146

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2010

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2010	4,411	2,585	3,391	3,161	13,547

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2010	3,970	441	2,455	129	2,713	678	610	2,551	13,547
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	1	1	1	4	0	16	27
Fireplace Fire Events 2010	8,593	15,273	5,314	4,479	5,871	23,488	1,320	88,364	152,701

Wood Burned, lb/year = 2007 AQMP number of households 2010 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2010 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2010 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2010 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	197	205	1,078	2,533	16	148

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2011

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2011	5,533	934	3,129	3,549	13,145

2007 AQMP number reducted by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2011	4,980	553	888	47	2,503	626	684	2,865	13,145
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	0	0	1	4	0	18	28
Fireplace Fire Events 2011	10,778	19,158	1,921	1,619	5,418	21,673	1,482	99,214	161,264

Wood Burned, lb/year = 2007 AQMP number of households 2011 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2011 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2011 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2011 x NG Burned, cft/FF

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	208	216	1,138	2,675	17	157

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2012

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2012	5,587	938	3,205	3,614	13,343

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2012	5,028	559	891	47	2,564	641	697	2,917	13,343
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	0	0	1	4	0	18	29
Fireplace Fire Events 2012	10,883	19,344	1,929	1,625	5,550	22,200	1,508	101,012	164,052

Wood Burned, lb/year = 2007 AQMP number of households 2012 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2012 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2008 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2012 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	211	220	1,158	2,721	17	159

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2013

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2013	5,641	942	3,283	3,679	13,544

2007 AQMP number reduced by 10 percent to account for exemptions

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2013	5,077	564	894	47	2,626	657	710	2,970	13,544
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	0	0	1	4	0	18	29
Fireplace Fire Events 2013	10,989	19,532	1,936	1,632	5,685	22,740	1,536	102,842	166,892

Wood Burned, lb/year = 2007 AQMP number of households 2013 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2013 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2013 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2013 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	215	224	1,178	2,768	18	162

NATURAL GAS EMISSIONS FROM NATURAL GAS LOG SETS IN NEW DEVELOPMENT 2014

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2014	5,696	945	3,363	3,746	13,749

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.79998554	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Fire Place Events

	LA		OR		RC		SB		Total
2007 AQMP Number of Households 2014	5,126	569	898	47	2,690	673	722	3,023	13,749
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Natural Gas Burned, MMscf/year	2	3	0	0	1	4	0	18	30
Fireplace Fire Events 2014	11,095	19,722	1,943	1,638	5,823	23,294	1,564	104,706	169,784

Wood Burned, lb/year = 2007 AQMP number of households 2014 x annual wood burned, lb/year
Wood Burned, lb/day = 2007 AQMP number of households 2014 x wood burned, lb/FFE
Natural Gas Burned, MMscf/year = Fireplace Fire Events 2014 x NG Burned, cft/FFE
Natural Gas Burned, MMscf/day = 2007 AQMP number of households 2014 x NG Burned, cft/FFE

AP-42 Emission Factors

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/MMscf	7.3	7.6	40	94	0.6	5.5

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Annual Emission Reductions

Pollutant	PM2.5	PM10	CO	NOx	SOx	VOC
Natural Gas Burning EF, lb/year	219	228	1,198	2,816	18	165

NEW DEVELOPMENT REDUCTIONS, LB/DAY

Description	PM2.5	PM10	CO	NOX	SOX	ROG
Wood Burning Reductions	635	660	5,150	53	8.3	277
Natural Gas Emissions	3.9	4.1	21.5	51	0.3	3.0
New Development Reductions	631	655	5,128	2.3	8.0	274

TOTAL CRITERIA REDUCTIONS FROM PR 445

Description	ROG	NOX	SOX	CO	PM10	PM2.5
New Development Reductions	274	2.3	8.0	5,128	655	631
Curtailment Reductions	595	124	21	10,075	1,374	1,333
Total Reductions	870	125.9	28.6	15,204	2,029	1,964

GREENHOUSE GAS EMISSION ESTIMATES USING AP-42

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2014	5,696	945	3,363	3,746	13,749

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.799985535	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Fire Place Events

	LA		OR		RC		SB		Total
Project Number of Households 2014	5,126	569	898	47	2,690	673	722	3,023	13,749
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Fireplace Fire Events 2014	11,095	19,722	1,943	1,638	5,823	23,294	1,564	104,706	169,784

Wood Burned per Fireplace Fire Event

Description	Wood Burnt, kg/hr	FFE, hr	Wood Burned, lb/FFE
Wood burning	7.7	3	23.1

Staff Report assumes 7.7 pounds of wood burned per hour in a wood burning device and three hours per event

Natural Gas Burned per Fireplace Fire Event

Description	Avg Rating, Btu/hr	Usage, cft/hr	FFE, hr	NG Burned, cft/FFE
Natural Gas	60,000	59	3	176.5

Staff Report assumes average rating at 60,000 btu/hr and three hours per fireplace fire event
Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)

Emission Factors

Description	Wood Burning EF, lb CO2/ton wood	NG Combustion EF, lb CO2/ MMscf	Wood Burning EF, lb/hr	NG EF, lb/hr	FFE, hr	Wood Burning EF, lb CO2/FFE	NG EF, lb CO2/FFE
Emission Factors	3,400	120,000	39.27	21	3	118	64

Wood burning emission factor from AP-42, Table 1.9-1 Emission Factors for Wood Combustion in Residential Fireplaces
Natural gas emission factor from AP-42, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion
Wood burning emission factor, lb/hr = (wood burning emission factor, lb CO2/ton wood burned x wood burned, lb/FEE)/2000 lb/ton
Natural gas burning emission factor, lb/hr = (natural gas emission factor, lb CO2/scft x natural gas burned, scft/FEE)

New Homes Incremental CO2

Gas Emissions	Baseline, lb CO2	PR 445, lb CO2	Remaining Emission, lb CO2	Remaining Emission, ton CO2	Remaining Emission, metric ton CO2
With Direct Biomass CO2 Emissions	20,002,285	10,786,295	-9,215,990	-4,608	-4,180
Without Direct Biomass Emissions	0	10,786,295	10,786,295	5,393	4,893

GREENHOUSE GAS EMISSION ESTIMATES USING HOUCK LIFE CYCLE ANALYSIS EMISSION FACTORS

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households 2014	5,696	945	3,363	3,746	13,749

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.799985535	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Fire Place Events

	LA		OR		RC		SB		Total
Project Number of New Wood Burning Households 2014	5,126	569	898	47	2,690	673	722	3,023	13,749
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Number of Fireplace Fire Events 2014	11,095	19,722	1,943	1,638	5,823	23,294	1,564	104,706	169,784

Staff Report assumes 7.7 pounds of wood burned per hour in a wood burning device and three hours per event

Number of fireplace fire events = Number of households x annual wood burned, lb/yr)/(7.7 lb wood burned/hr x 3 hour/event)

New Homes

Gas Emissions	Vented NG Fireplaces	Vented LPG Fireplaces	Vented NG Log Sets	Vented LPG Log Sets	Cordwood	Traditional Wax-Fiber Firelogs	Petroleum-Free Biomass Firelogs
Lifecycle Greenhouse Gas Emissions, lb CO2-Eq./fireplace fire events	11.7	12.6	24	25.7	5.5	17.5	4.3
PR 445 Increase 2014, lb/CO2	1,986,476	2,139,282	4,074,823	4,363,456	933,814	2,971,225	730,072

Emissions per fireplace fire events from Global Warming Reduction Benefits of Manufactured Biomass-Fire Fireplace Logs, James E. Houck, Ph.D., March 27, 2007.

PR 445 increase 2014, lb/CO2 = Number of fireplace fire events 2008-2014 x Greenhouse gas emissions, lb CO2-Eq./fireplace fire event

New Homes Incremental CO2

Gas Emissions	Baseline, lb CO2	PR 445, lb CO2	Remaining Emission, lb CO2	Remaining Emission, ton CO2	Remaining Emission, metric ton CO2
CO2 Emissions	1,382,044	4,074,823	2,692,779	1,346	1,221

GREENHOUSE GAS EMISSION ESTIMATES USING HOUCK LIFE CYCLE ANALYSIS DIRECT EMISSION FACTORS

Affected Wood Burning New Development

Description	LA	OC	RC	SB	Total
2007 AQMP Number of New Wood Burning Households (2008-2014)	5,696	945	3,363	3,746	13,749

2007 AQMP number reduced by 10 percent to account for exemptions.

Wood Burning Use Ratios by County

	LA		OR		RC		SB	
Description	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr	Ratio of Households Using 50 lb/yr	Ratio of Households Using 800 lb/yr
Wood Burning Use Ratios	0.900015024	0.099984976	0.949962156	0.050037844	0.799985535	0.200014465	0.192851105	0.807148895

Based on socioeconomic analysis.

Fire Place Events

	LA		OR		RC		SB		Total
Project Number of New Wood Burning Households 2014	5,126	569	898	47	2,690	673	722	3,023	13,749
Annual Wood Burned, lb/year	50	800	50	800	50	800	50	800	
Fireplace Fire Events 2014	11,095	19,722	1,943	1,638	5,823	23,294	1,564	104,706	169,784

Staff Report assumes 7.7 pounds of wood burned per hour in a wood burning device and three hours per event

Fireplace events = Number of households x annual wood burned, lb/yr)/(7.7 lb wood burned/hr x 3 hour/event)

New Homes

Gas Emissions	Vented NG Fireplaces	Vented LPG Fireplaces	Vented NG Log Sets	Vented LPG Log Sets	Cordwood	Traditional Wax-Fiber Firelogs	Petroleum-Free Biomass Firelogs
Direct Greenhouse Gas Emissions, lb CO2-Eq./fireplace fire events	9.3	10.6	18.9	21.6	49.7	13.3	13.2
PR 445 Increase 2014, lb/CO2	1,578,994	1,799,713	3,208,923	3,667,340	8,438,278	2,258,131	2,241,152

Emissions per fireplace fire events from Global Warming Reduction Benefits of Manufactured Biom ass-Fire Fireplace Logs, James E. Houck, Ph.D., March 27, 2007.

PR 445 increase 2014, lb/CO2 = Number of fireplace fire events 2008-2014 x Greenhouse gas emissions, lb CO2-Eq./fireplace fire event

New Homes Incremental CO2

Gas Emissions	Baseline, lb CO2	PR 445, lb CO2	Remaining Emission, lb CO2	Remaining Emission, ton CO2	Remaining Emission, metric ton CO2
With Direct Biomass CO2 Emissions	7,078,646	3,208,923	-3,869,723	-1,935	-1,755
Without Direct Biomass Emissions	0	3,208,923	3,208,923	1,604	1,456

Equipment Description	**CES/EIC Codes**	**NOx**	**VOC**	**CO**	**SOx**	**Total PM**	**PM10 fraction of Total PM**	**PM2.5 fraction of Total PM**
ARB Wood Combustion - Wood Stoves[a]	610-600-0230-0000	0.2	1.05	14.34	0.03	2.4	2.25	2.17
ARB Wood Combustion – Fireplaces[a]	610-602-0230-0000	0.31	1.6	29.78	0.05	4.08	3.81	3.67
Total ARB Wood Burning Appliance Inventory, ton/day		0.51	2.65	44.12	0.08	6.48	6.06	5.84
OMNI PM Wood Burning Appliance Inventory, ton/day[b]								10.10
Total SCAB Wood Burning Appliance Inventory, ton/day[c]		0.88	4.58	76.30	0.14	11.65	10.49	10.10
Wood Burning Appliance Inventory, pound/day	-	1,764	9,166	152,607	277	23,307	20,976	20,200
Burning Prohibition, pound/day	-	882	4,583	76,303	138	11,653	10,488	10,100

a) ARB's CEIDERS database, Area Source Category for 2002.

b) PM2.5 EF from Table 4.6 of Residential Wood Combustion Emission Inventory South Coast Air Quality Air Basin and Coachella Valley Portion of Salton Sea Air Basin 2002 Base Year, OMNI Environmental Services, October 24, 2006 (OMNI Report, 2006)

c) PM2.5 values from OMNI Report. PM and PM10 values estimated from PM10/PM (0.90) and PM2.5/PM(0.935) ratios from ARB's CEIDARS database. NOx, VOC, SOx, and CO values estimated by the ratio of the OMNI PM2.5 to the ARB PM2.5 emission inventory.
(e.g., Total NOx, ton/day = (ARB NOx)(OMNI PM2.5, ton/day)/(ARB PM2.5, ton/day) = (0.51)(10.10)/(5.84) = 0.88

WOOD BURNING APPLIANCE EMISSION REDUCTIONS

Adjusted PM Emission Factors

Pollutant	EPA certified non-cat heater EF	EPA certified non-cat heater EF	EPA cordwood EF
PM2.5, g/kg	5.87	7.54	13
PM2.5, lb/ton	11.74	15.08	26
PM10, lb/ton	12.19	15.66	27

- PM2.5 EF from Table 4.6 of Residential Wood Combustion Emission Inventory South Coast Air Quality Air Basin and Coachella Valley Portion of Salton Sea Air Basin 2002 Base Year, OMNI Environmental Services, October 24, 2006 (Omni, 2006)
- PM10 EF estimated from the Ratio of PM10 (0.90) and PM2.5 (0.935) fractions of PM as presented in the ARB CEIDARS database

Average of EPA Phase II Certified Emission Factors

Pollutant	EPA certified non-cat heater EF, lb/ton	EPA certified non-cat heater EF, lb/ton	EPA certified average EF, lb/ton
PM2.5	11.74	15.08	13.4
PM10	12.19	15.66	13.9
CO	107	140.8	123.9
NOx	2.0	N/A	2.0
SOx	0.4	0.4	0.4
VOC	12	15	13.5

Adjusted PM emission factors Omni Report, 2006.
Remaining criteria emission factors from AP-42, Table 1.10-1, October 2006.

Emission Reduction from an EPA Phase II Certified Unit for New Installations

Pollutant	Usage, cord/ house/ year	Cord Weigh, kg/cord	Fireplace EF lb/ton	Avg EPA Phase II EF lb/ton	Fireplace Emissions lb/year	EPA Phase II Emissions lb/year	Fireplace Emissions lb/day	EPA Phase II Emissions lb/day	Emissions Reduction, lb/day	Percent Reduction
PM2.5	0.28	1,400	26.0	13.4	1.12E+01	5.79E+00	3.08E-02	1.59E-02	1.49E-02	48.4
PM10	0.28	1,400	27.0	13.9	1.17E+01	6.02E+00	3.20E-02	1.65E-02	1.55E-02	48.4
CO	0.28	1,400	252.6	123.9	1.09E+02	5.35E+01	2.99E-01	1.47E-01	1.52E-01	51.0
NOx	0.28	1,400	2.8	2.0	1.21E+00	8.64E-01	3.31E-03	2.37E-03	9.47E-04	28.6
SOx	0.28	1,400	0.4	0.4	1.73E-01	1.73E-01	4.74E-04	4.74E-04	0	0
TOC	0.28	1,400	53	13.5	2.29E+01	5.83E+00	6.27E-02	1.60E-02	4.68E-02	74.5

- Staff Report for PR 445, Appendix C.
- Cord Weight, kg/cord - from estimate in Table 4.6 of OMNI, 2006.
- Emissions, lb/year = (Usage cord/house/year x Cord Weight, kg/cord x 2.20 lb/kg x EF, lb/ton)/(2,000 lb/ton)
- Emissions, lb/day = Emissions, lb/year/365 day/year

Emission Reduction from an EPA Phase II Certified Unit for Commercial Replacement

Pollutant	Usage, cord/ facility/ year	Cord Weigh, kg/cord	Fireplace EF lb/ton	Avg EPA Phase II EF lb/ton	Fireplace Emissions lb/year	EPA Phase II Emissions lb/year	Fireplace Emissions lb/day	EPA Phase II Emissions lb/day	Emissions Reduction, lb/day	Percent Reduction
PM2.5	1	1,400	26.0	13.4	4.01E+01	2.07E+01	1.10E-01	5.67E-02	5.32E-02	48.4
PM10	1	1,400	27.0	13.9	4.17E+01	2.15E+01	1.14E-01	5.89E-02	5.53E-02	48.4
CO	1	1,400	252.6	123.9	3.90E+02	1.91E+02	1.07E+00	5.24E-01	5.44E-01	51.0
NOx	1	1,400	2.8	2	4.32E+00	3.09E+00	1.18E-02	8.46E-03	3.38E-03	28.6
SOx	1	1,400	0.4	0.4	6.17E-01	6.17E-01	1.69E-03	1.69E-03	0.00E+00	0
TOC	1	1,400	53	13.5	8.18E+01	2.08E+01	2.24E-01	5.71E-02	1.67E-01	74.5

- Staff Report for PR 445, Appendix C.
- Cord Weight, kg/cord - from estimate in Table 4.6 of OMNI Report, 2006.
- Emissions, lb/year = (Usage cord/house/year x Cord Weight, kg/cord x 2.20 lb/kg x EF, lb/ton)/(2,000 lb/ton)
- Emissions, lb/day = Emissions, lb/year/365 day/year

Emission Reduction from an EPA Phase II Certified Unit for Residential Replacement

Pollutant	Usage, cord/ house/ year	Cord Weight, kg/cord	Fireplace EF lb/ton	Avg EPA Phase II EF lb/ton	Fireplace Emissions lb/year	EPA Phase II Emissions lb/year	Fireplace Emissions lb/day	EPA Phase II Emissions lb/day	Emissions Reduction, lb/day	Percent Reduction
PM2.5	0.95	1,400	26	13.41	3.81E+01	1.97E+01	1.04E-01	5.39E-02	5.06E-02	48.4
PM10	0.95	1,400	27	13.9	3.96E+01	2.04E+01	1.08E-01	5.59E-02	5.25E-02	48.4
CO	0.95	1,400	252.6	123.9	3.70E+02	1.82E+02	1.01E+00	4.98E-01	5.17E-01	51.0
NOx	0.95	1,400	2.8	2	4.11E+00	2.93E+00	1.12E-02	8.03E-03	3.21E-03	28.6
SOx	0.95	1,400	0.4	0.4	5.86E-01	5.86E-01	1.61E-03	1.61E-03	0.00E+00	0.0
TOC	0.95	1,400	53	13.5	7.77E+01	1.98E+01	2.13E-01	5.42E-02	1.59E-01	74.5

- Staff Report for PR 445, Appendix C.
- Cord Weight, kg/cord - from estimate in Table 4.6 of OMNI Report, 2006.
- Emissions, lb/year = (Usage cord/house/year x Cord Weight, kg/cord x 2.20 lb/kg x EF, lb/ton)/(2,000 lb/ton)
- Emissions, lb/day = Emissions, lb/year/365 day/year

NATURAL GAS APPLIANCE CRITERIA EMISSIONS

External Combustion Emission Factors

Description	VOC, lb/MMcft	CH4, lb/MMcft	NOx, lb/MMcft	SOx, lb/MMcft	CO, lb/MMcft	PM, lb/MMcft
Natural Gas (MMscf) - Other Equipment	7	2.3	130	0.6	35	7.5
LPG, Propane, Butane (1,000 gal.)	0.26	0.28	12.8	4.6	3.2	0.28

Source: 2005-2006 Annual Emissions Report Program

External Natural Gas Combustion Emissions for Residential Heaters

Description	Duration, day/year	Hourly Usage, mmcft/hr	Emissions VOC	Emissions NOx	Emissions SOx	Emissions CO	Emissions PM10	PM2.5
Annual	112	3.922E-05	3.07E-02	5.71E-01	2.64E-03	1.54E-01	3.29E-02	3.29E-02
Daily	-	-	8.42E-05	1.56E-03	7.22E-06	4.21E-04	9.02E-05	9.02E-05

- Duration, day/yr = (392 kg of wood burned/yr)/(3.5 kg of wood burned/hour) = 112 hour/yr, where kg of wood burned/time values are from OMNI Report, 2006.
- Heater ratings vary between 60,000 and 20,000 Btu/hour. An average of 40,000 Btu/hour was used to be conservative, because the higher range would generate larger emission reductions. The average heater rating was used in the Staff Report.
- Hourly usage, mmcft/hr = (40,000 Btu/hr)/(1,000,000 Btu/MMbtu)/(1,020 Btu/cft)
- Annual Emissions, lb/year = Duration, hour/year x Hourly Usage, MMcft/hr x EF, lb/MMcft
- Daily Emissions, lb/year = (Annual Emissions, lb/year)/(365 day/year)

External Natural Gas Combustion Emissions for Commercial Appliances

Description	Duration, hour/year	Hourly Usage, mmcft/hr	Emissions VOC	Emissions NOx	Emissions SOx	Emissions CO	Emissions PM10	PM2.5
Annual	400	3.92E-05	1.10E-01	2.04E+00	9.41E-03	5.49E-01	1.18E-01	1.18E-01
Daily	-	-	3.01E-04	5.59E-03	2.58E-05	1.50E-03	3.22E-04	3.22E-04

- Duration, day/year = (1 cord of wood burnt/year)(1,400 kg/cord)/(3.5 kg of wood burnt/hour) = 800 hour/year where kg pf wood burnt/time values are from Houck, 2006.
- Heater ratings vary between 60,000 and 20,000 Btu/hour. An average of 40,000 Btu/hour was used to be conservative, because the higher range would generate larger emission reductions. The average heater rating was used in the Staff Report.
- Hourly usage, mmcft/hr = (40,000 Btu/hr)/(1,000,000 Btu/MMbtu)/(1,020 Btu/cft)
- Annual Emissions, lb/year = Duration, hour/year x Hourly Usage, MMcft/hr x EF, lb/MMcft
- Daily Emissions, lb/year = (Annual Emissions, lb/year)/(365 day/year)

Emission Reductions from Natural Gas Combustion Unit

Description	VOC	NOx	SOx	CO	PM10	PM2.5
Natural gas, lb/day	8.42E-05	1.56E-03	7.22E-06	4.21E-04	9.02E-05	9.02E-05
Wood, pre-EPA, lb/day	6.27E-02	3.31E-03	4.74E-04	2.99E-01	3.20E-02	3.08E-02
Emissions Reduction, lb/day	6.27E-02	1.75E-03	4.66E-04	2.99E-01	3.19E-02	3.07E-02
Percent Reduction	99.87	52.81	98.48	99.86	99.72	99.71

Emission Reductions, lb/day = Pre-EPA wood burning emissions - Natural gas unit emissions

Emission Reductions from Natural Gas Combustion Unit for Commercial Replacement

Description	VOC	NOx	SOx	CO	PM2.5	PM2.5
Natural gas, lb/day	3.01E-04	5.59E-03	2.58E-05	1.50E-03	3.22E-04	3.22E-04
Wood, pre-EPA, lb/day	2.24E-01	1.18E-02	1.69E-03	1.07E+00	1.14E-01	1.10E-01
Emissions Reduction, lb/day	2.24E-01	6.25E-03	1.67E-03	1.07E+00	1.14E-01	1.10E-01
Percent Reduction	99.87	52.81	98.48	99.86	99.72	99.71

Emission Reductions, lb/day = Pre-EPA wood burning emissions - Natural gas unit emissions

Emission Reductions from Natural Gas Combustion Unit for Residential Replacement

Description	VOC	NOx	SOx	CO	PM2.5	PM2.5
Natural gas, lb/day	8.42E-05	1.56E-03	7.22E-06	4.21E-04	9.02E-05	9.02E-05
Wood, pre-EPA, lb/day	2.13E-01	1.12E-02	1.61E-03	1.01E+00	1.08E-01	1.04E-01
Emissions Reduction, lb/day	2.13E-01	9.68E-03	1.60E-03	1.01E+00	1.08E-01	1.04E-01
Percent Reduction	99.96	86.09	99.55	99.96	99.92	99.91

Emission Reductions, lb/day = Pre-EPA wood burning emissions - Natural gas unit emissions

TOTAL CRITERIA EMISSIONS AND CRITERIA EMISSION REDUCTIONS

Emission Reductions between Non-Compliant Wood Burning Appliances and Clean Technologies per Unit for New Installation

Description	VOC	NOx	SOx	CO	PM10	PM2.5
Emissions Reduction Electric or Inoperation, lb/day	6.27E-02	3.31E-03	4.74E-04	2.99E-01	3.20E-02	3.08E-02
Emissions Reduction Wood Burning, lb/day	4.68E-02	9.47E-04	0.00E+00	1.52E-01	1.55E-02	1.49E-02
Emissions Reduction Natural Gas, lb/day	6.27E-02	1.75E-03	4.66E-04	2.99E-01	3.19E-02	3.07E-02

New Construction, Daily Reduction Each Year

Description	Number of Units Annually	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Wood Burning, lb/day	512	24.0	0.5	0.0	78.1	7.9	7.6
Emissions Reduction Natural Gas, lb/day	4,355	273	7.6	2.0	1,300	139	134
Emission Reduction, Electric, lb/day	256	16	0.8	0.1	77	8.2	7.9
Total Reductions, lb/day	-	313	9	2	1,455	155	149
Total Reduction with Discount for Fire Places Not Used, lb/day	-	228	7	1.6	1,062	113	109

Staff Report estimates that 5,213 fireplaces would be installed per year and that 10 percent are EPA Phase II units, 85 percent are natural gas units and five percent are electric units.
Staff Report estimates that 27 percent of the residential fireplaces are not used. Therefore, only 73 percent of the total reductions are reported.

New Construction from 2007 to 2014

Description	Number of Units 2007 to 2014	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Wood Burning, lb/day	3,586	167.7	3.4	0.0	546.4	55.5	53.4
Emissions Reduction Natural Gas, lb/day	30,482	1,910	53	14	9,102	972	935
Emission Reduction, Electric, lb/day	1,793	113	6	0.8	536	57	55
Total Reductions, lb/day	-	2,190	63	15	10,185	1,084	1,044
Total Reduction with Discount for Fire Places Not Used, lb/day	-	1,599	46	11	7,435	792	762

Staff Report estimates that 5,213 fireplaces would be installed per year over seven years and that 10 percent would be EPA Phase II units, 85 percent would be natural gas units and five percent would be electric units.
Staff Report estimates that 27 percent of the residential fireplaces are not used. Therefore, only 73 percent of the total reductions are reported.

Emission Reductions between Non-Compliant Wood Burning Appliances and Clean Technologies per Unit for Commercial Facility Replacement

Description	VOC	NOx	SOx	CO	PM10	PM2.5
Emissions Reduction Electric or Inoperation, lb/day	2.24E-01	1.18E-02	1.69E-03	1.07E+00	1.14E-01	1.10E-01
Emissions Reduction Wood Burning, lb/day	1.67E-01	3.38E-03	0.00E+00	5.44E-01	5.53E-02	5.32E-02
Emissions Reduction Natural Gas, lb/day	2.23E-01	1.06E-04	1.64E-03	1.06E+00	1.13E-01	1.09E-01

Replacement of Commercial Facility Wood Burning Applications

Description	Total Number of Units	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
Emissions Reduction Natural Gas, lb/day	125	21	0.4	0	68	6.9	6.7
Emissions Reduction Wood Burning, lb/day	125	28	0.01	0.205	133	14	14
Total Reductions, lb/day	-	49	0.4	0.205	201	21	20

Staff Report estimates that 250 appliances would be replaced per year and that 50 percent would be EPA Phase II units and 50 percent would be natural gas units.

Emission Reductions between Non-Compliant Wood Burning Appliances and Clean Technologies per Unit for Residential Replacement

Description	VOC	NOx	SOx	CO	PM10	PM2.5
Emissions Reduction Electric or Inoperation, lb/day	2.13E-01	1.12E-02	1.61E-03	1.01E+00	1.08E-01	1.04E-01
Emissions Reduction Wood Burning, lb/day	1.59E-01	3.21E-03	0.00E+00	5.17E-01	5.25E-02	5.06E-02
Emissions Reduction Natural Gas, lb/day	2.13E-01	9.68E-03	1.60E-03	1.01E+00	1.08E-01	1.08E-01

Replacement of Residential Wood Burning Heaters

Description	Total Number of Units	VOC	NOx	SOx	CO	PM10	PM2.5
Emissions Reduction Wood Burning, lb/day	19,190	3,045	62	0.0	9,920	1,008	970
Emissions Reduction Natural Gas, lb/day	5,483	1,167	53	8.8	5,561	594	595
Emission Reduction, Inoperation, lb/day	2,741	584	31	4.4	2,781	297	286
Total Reductions, lb/day	-	4,795	146	13	18,262	1,899	1,851

Staff Report estimates that 27,414 heaters would be replaced and that 70 percent would be EPA Phase II units, 20 percent would be natural gas units and 10 percent would be rendered inoperable.

Reductions from Replacement of Residential Wood Burning Heaters Based on Property Transferred in a Single Year

Description	Total Number of Units	VOC	NOx	SOx	CO	PM10	PM2.5
Emissions Reduction Wood Burning, lb/day	1,919	304	6.2	0.0	992	101	97
Emissions Reduction Natural Gas, lb/day	548	117	5.3	0.9	556	59	59
Emission Reduction, Permanent Inoperation, lb/day	274	58	3.1	0.4	278	30	29
Total Reductions, lb/day	-	479	15	1.3	1,826	190	185
Total Reductions with Discount for Fire Places Not Used, lb/day	-	441	13	1.2	1,680	175	170

Staff Report estimates that 2,741 heaters would be replaced and that 70 percent would be EPA Phase II units, 20 percent would be natural gas units and 10 percent would be rendered inoperable.

Replacement of Residential Wood Burning Heaters from 2012 to 2014

Description	Total Number of Units	VOC	NOx	SOx	CO	PM10, lb/day	PM2.5
Emissions Reduction Wood Burning, lb/day	3,838	609	12.3	0.0	1,984	202	194
Emissions Reduction Natural Gas, lb/day	1,097	233	10.6	1.8	1,112	119	119
Emission Reduction, Permanent Inoperation, lb/day	548	117	6.2	0.9	556	59	57
Total Reductions, lb/day	-	959	29	3	3,652	380	370
Total Reductions with Discount for Fire Places Not Used, lb/day	-	882	27	2	3,360	349	341

Staff Report estimates that 2,741 heaters would be replaced per year and that 70% would be EPA Phase II units, 20% would be natural gas units and 10% would be rendered inoperable.

Total Reductions by 2014

Description	Total Number of Units	VOC, lb/day	NOx, lb/day	SOx, lb/day	CO, lb/day	PM10, lb/day	PM2.5, lb/day
New Construction	35,861	1,599	46	11	7,435	792	762
Burning Prohibitions	-	4,583	882	138	76,303	10,488	10,100
Replacement of Commercial Wood Burning Appliances by 2010	250	48.8	1.2	0.2	201.3	21.1	20.4
Total Reductions	-	6,231	929	150	83,940	11,301	10,883

HEALTH RISK FROM NATURAL GAS APPLIANCES

The health risk assessment for natural gas appliances was completed according to Tier II methodology as described in the Health Risk Procedures for Rules 212 and 1401, Version 7, July 1, 2005. The hours of operation were estimated using the high end of wood usage from the Staff Report (840 hours per year) to be conservative, because higher wood usage would leads to larger health risk. The lower end of wood usage was used to estimate the emission reductions, because the lower wood usage leads to lower emissions, which would lead to lower emission reductions. A Tier II health risk assessment was completed for this analysis. Conservative assumptions were made for the Tier II health risk assessment. . It was assumed that sensitive receptors would be within 25 meters of a commercial facility. The commercial facility was assumed to be in the West Los Angeles area. The stack height was assumed to be less than 20 feet tall.

Natural Gas Appliance Emissions

Pollutant	Season, hour/year	Hourly Usage, MMcft/hr	EF lb/MMcf	Emission lb/hr	Emission ton/year
Benzene	840	5.8824E-05	0.0058	3.41E-07	1.43E-07
Formaldehyde	840	5.8824E-05	0.0123	7.24E-07	3.04E-07
PAH's (including naphthalene)	840	5.8824E-05	0.0004	2.35E-08	9.88E-09
Naphthalene	840	5.8824E-05	0.0003	1.76E-08	7.41E-09
Acetaldehyde	840	5.8824E-05	0.0031	1.82E-07	7.66E-08
Acrolein	840	5.8824E-05	0.0027	1.59E-07	6.67E-08
Propylene	840	5.8824E-05	0.53	3.12E-05	1.31E-05
Toluene	840	5.8824E-05	0.0265	1.56E-06	6.55E-07
Xylenes	840	5.8824E-05	0.0197	1.16E-06	4.87E-07

Natural Gas Appliance Emissions

Pollutant	Season, hour/year	Hourly Usage, MMcft/hr	EF lb/MMcf	Emission lb/hr	Emission ton/year
Ethyl benzene	840	5.8824E-05	0.0069	4.06E-07	1.70E-07
Hexane	840	5.8824E-05	0.0046	2.71E-07	1.14E-07

- Staff Report for PR 445, Appendix C, 7 hour/day x 120 day/year = 840 hour/year
- Hourly usage based on maximum rating of 60,000 Btu/hr, (60,000 Btu/hr)/(1020 Btu/cft)
- EF, lb/MMcft from SCAQMD website: http://www.aqmd.gov/prdas/pdf/COMBEM2001.pdf.
- Emissions, lb/hr = Hourly Usage, MMcft/hr x EF, lb/MMcf
- Emissions, lb/yr = Season, hr/year x Hourly Usage, MMcft/hr x EF, lb/MMcft

Cancer Risk from Natural Gas Appliance

Pollutant	Emission ton/year	CP (ug/kg-day)-1	X/Q [(ug/m3)/ (ton/yr)]	MET	DBR L/(kg-day)	AFann	EVF	MP	Cancer Risk
Benzene	1.43E-07	2.90E-05	51.18	1	302	4.2	0.96	1	2.6E-13
Formaldehyde	3.04E-07	6.00E-06	51.18	1	302	4.2	0.96	1	1.1E-13
PAH's (including naphthalene)	9.88E-09	1.10E-03	51.18	1	302	4.2	0.96	1	6.8E-13
Acetaldehyde	7.66E-08	2.70E-06	51.18	1	302	4.2	0.96	1	1.3E-14
Total									**1.1E-12**

Cancer Risk = Emissions x CP x X/Q x MET x DBR X AFann x EVF x MP

Chronic Non-Cancer Risk from Natural Gas Appliance

Pollutant	Emission ton/year	Chronic REL (ug/kg-day)	X/Q [(ug/m3)/ (ton/yr)]	MET	MP	Pre-EPA Chronic HI
Benzene	1.43E-07	6.00E+01	51.18	1	1	1.22E-07
Formaldehyde	3.04E-07	3.00E+00	51.18	1	1	5.18E-06
Naphthalene	7.41E-09	9.00E+00	51.18	1	1	4.21E-08
Acetaldehyde	7.66E-08	9.00E+00	51.18	1	1	4.36E-07
Acrolein	6.67E-08	6.00E+00	51.18	1	1	5.69E-07
Propylene	1.31E-05	3.00E+03	51.18	1	1	2.23E-07
Toluene	6.55E-07	3.00E+02	51.18	1	1	1.12E-07
Xylenes	4.87E-07	7.00E+02	51.18	1	1	3.56E-08
Ethyl benzene	1.70E-07	2.00E+03	51.18	1	1	4.36E-09
Hexane	1.14E-07	7.00E+03	51.18	1	1	8.31E-10

Chronic HI = (Emissions x X/Q x MET x MP)/Chronic REL

Chronic Non-Cancer Risk from Natural Gas Appliance by Target Organ

Toxic Air Contaminant	AL	DEV	END	EYE	HEM	KID	NS	RESP
Benzene		1.22E-07			1.22E-07		1.22E-07	
Formaldehyde				5.18E-06				5.18E-06
Napthalene								4.21E-08
Acetaldehyde								4.36E-07
Acrolein				5.69E-07				5.69E-07
Propylene (Propene)								2.23E-07
Toluene		1.12E-07					1.12E-07	1.12E-07
Xylene							3.56E-08	3.56E-08
Ethyl benzene	4.36E-09	4.36E-09	4.36E-09			4.36E-09		
Hexane (n-)							8.31E-10	
	4.36E-09	**2.38E-07**	**4.36E-09**	**5.75E-06**	**1.22E-07**	**4.36E-09**	**2.70E-07**	**6.60E-06**

AL	Alimentary
DEV:	Developmental
END	Endocrine
EYE	Eye
HEM:	Hematopoietic system
KID:	Kidney
NS:	Nervous system
RESP:	Respiratory system

Acute Non-Cancer Risk from Natural Gas Appliance

Pollutant	Emission, lb/hr	Acute REL (ug/m3)	X/Q [(ug/m3)/ (lb/hr)]	AF Avg Over Hours > 1	Pre-EPA Acute HI
Benzene	3.41E-07	1.30E+03	2000	0.83	4.36E-07
Formaldehyde	7.24E-07	9.40E+01	2000	0.83	1.28E-05
Acrolein	1.59E-07	1.90E-01	2000	0.83	1.39E-03
Toluene	1.56E-06	3.70E+04	2000	0.83	6.99E-08
Xylenes	1.16E-06	2.20E+04	2000	0.83	8.74E-08

Acute HI = (Emissions x X/Q x AF)/Acute REL

Acute Non-Cancer Risk from Natural Gas Appliance by Target Organ

Toxic Air Contaminant	DEV	EYE	HEM	IMM	NS	REP	RESP
Benzene	4.36E-07		4.36E-07	4.36E-07		4.36E-07	
Formaldehyde		1.28E-05		1.28E-05			1.28E-05
Acrolein		1.39E-03					1.39E-03
Toluene	6.99E-08	6.99E-08			6.99E-08	6.99E-08	6.99E-08
Xylene		8.74E-08					8.74E-08
	5.06E-07	**1.40E-03**	**4.36E-07**	**1.32E-05**	**6.99E-08**	**5.06E-07**	**1.40E-03**

DEV: Developmental
EYE: Eye
HEM: Hematopoietic system
IMM: Immune system
NS: Nervous system
REP: Reproductive system
RESP: Respiratory system

HEALTH RISK FROM WOOD BURNING APPLIANCES

The health risk assessment for wood burning appliances was completed according to Tier II methodology as described in the Health Risk Procedures for Rules 212 and 1401, Version 7, July 1, 2005. Based on Appendix C of the Staff Report, commercial facilities (one cord per year) use burn more wood than residences (0.28 cords per year). Therefore, wood burning appliances at a commercial facility would generate more health risk than wood burning heaters at a residence. A Tier II health risk assessment was completed for this analysis. Conservative assumptions were made for the Tier II health risk assessment. . It was assumed that sensitive receptors would be within 25 meters of a commercial facility. The commercial facility was assumed to be in the West Los Angeles area. The stack height was assumed to be less than 20 feet tall.

Wood Burning Appliance Emissions

Pollutant	Usage, kg/hr	Usage, kg/year	Conventional EF lb/ton	EPA Phase II EF lb/ton	Pre EPA lb/hour	EPA Phase II lb/hour	Pre EPA ton/year	EPA Phase II ton/year
Ethane	3.5	2,940	1.47	1.376	5.67E-03	5.31E-03	2.38E-03	2.23E-03
Ethylene	3.5	2,940	4.49	3.482	1.73E-02	1.34E-02	7.28E-03	5.64E-03
Acetylene	3.5	2,940	1.124	0.564	4.34E-03	2.18E-03	1.82E-03	9.14E-04
Propane	3.5	2,940	0.358	0.158	1.38E-03	6.10E-04	5.80E-04	2.56E-04
Propene	3.5	2,940	1.244	0.734	4.80E-03	2.83E-03	2.02E-03	1.19E-03
i-Butane	3.5	2,940	0.028	0.01	1.08E-04	3.86E-05	4.54E-05	1.62E-05
n-Butane	3.5	2,940	0.056	0.014	2.16E-04	5.40E-05	9.07E-05	2.27E-05
Butenes	3.5	2,940	1.192	0.714	4.60E-03	2.75E-03	1.93E-03	1.16E-03
Pentenes	3.5	2,940	0.616	0.15	2.38E-03	5.79E-04	9.98E-04	2.43E-04
Benzene	3.5	2,940	1.938	1.464	7.48E-03	5.65E-03	3.14E-03	2.37E-03
Toluene	3.5	2,940	0.73	0.52	2.82E-03	2.01E-03	1.18E-03	8.43E-04
Furan	3.5	2,940	0.342	0.124	1.32E-03	4.78E-04	5.54E-04	2.01E-04
Methyl Ethyl Ketone	3.5	2,940	0.29	0.062	1.12E-03	2.39E-04	4.70E-04	1.00E-04
2-Methyl Furan	3.5	2,940	0.656	0.084	2.53E-03	3.24E-04	1.06E-03	1.36E-04
2,5-Dimethyl Furan	3.5	2,940	0.162	0.002	6.25E-04	7.72E-06	2.63E-04	3.24E-06
Furfural	3.5	2,940	0.486	0.146	1.88E-03	5.63E-04	7.88E-04	2.37E-04
o-Xylene	3.5	2,940	0.202	0.186	7.79E-04	7.18E-04	3.27E-04	3.01E-04
PAH Total*	3.5	2,940	0.73	0.5	2.82E-03	1.93E-03	1.18E-03	8.10E-04
Cadmium*	3.5	2,940	2.20E-05	4.60E-05	8.49E-08	1.77E-07	3.56E-08	7.45E-08
Chromium*	3.5	2,940	1.00E-06	1.00E-06	3.86E-09	3.86E-09	1.62E-09	1.62E-09
Manganese*	3.5	2,940	1.70E-04	2.20E-04	6.56E-07	8.49E-07	2.75E-07	3.56E-07
Nickel*	3.5	2,940	1.40E-05	2.20E-06	5.40E-08	8.49E-09	2.27E-08	3.56E-09

- Staff Report for PR 445, Appendix C.
- EPA Phase II emission factors from AP-42 for catalytic units (when non-catalytic units are not reported) or the higher of catalytic or non-catalytic units if both are presented, Tables 1.10-2 through 10-4.
- Wood, ton/hour - from estimate in Table 4.4 of Residential Wood Combustion Emission Inventory South Coast Air Quality Air Basin and Coachella Valley Portion of Salton Sea Air Basin 2002 Base Year, OMNI Environmental Services, October 24, 2006 of 3.5 dry kg/hour of cordwood is burnt in a fireplace without an insert.
- Annual Wood Use - Commercial Wood Use from Staff Report, which is higher than residential use
- Emissions, lb/hr = Hourly Wood Usage, kg/hr x EF, lb/ton x 2.20 lb/kg)/(2,000 lb/ton)
- Emissions, ton/yr = (Annual Wood Use, kg/year x EF, lb/ton x 2.20 lb/kg)/(2,000 lb/ton)/(2,000 lb/ton)

Cancer Risk from Wood Burning Appliance

Pollutant	Pre EPA ton/year	EPA Phase II ton/year	CP (ug/kg-day)-1	X/Q [(ug/m3)/(ton/yr)]	MET	DBR L/(kg-day)	Afann	EVF	MP	Pre-EPA Cancer Risk	EPA Phase II Cancer Risk
Benzene	3.14E-03	2.37E-03	2.90E-05	51.18	1	302	4.2	0.96	1	5.7E-09	4.3E-09
PAH Total*	1.18E-03	8.10E-04	1.10E-03	51.18	1	302	4.2	0.96	1	8.1E-08	5.6E-08
Cadmium*	3.56E-08	7.45E-08	4.20E-03	51.18	1	302	4.2	0.96	1	9.3E-12	2.0E-11
Nickel*	2.27E-08	3.56E-09	2.60E-04	51.18	1	302	4.2	0.96	1	3.7E-13	5.8E-14
Total										**8.68E-08**	**5.98E-08**

Cancer Risk = Emissions x CP x X/Q x MET x DBR X AFann x EVF x MP

Chronic Non-Cancer Risk from Wood Burning Appliances

Pollutant	Pre EPA ton/year	EPA Phase II ton/year	Chronic REL (ug/kg-day)	X/Q [(ug/m3)/(ton/yr)]	MET	MP	Pre-EPA Chronic HI	EPA Phase II Chronic HI
Benzene	3.14E-03	2.37E-03	60	51.18	1	1	2.68E-03	2.02E-03
Toluene	1.18E-03	8.43E-04	300	51.18	1	1	2.02E-04	1.44E-04
o-Xylene	3.27E-04	3.01E-04	700	51.18	1	1	2.39E-05	2.20E-05
Cadmium*	3.56E-08	7.45E-08	0.02	51.18	1	1.5	1.37E-04	2.86E-04
Manganese*	2.75E-07	3.56E-07	0.2	51.18	1	1	7.05E-05	9.12E-05
Nickel*	2.27E-08	3.56E-09	0.05	51.18	1	1	2.32E-05	3.65E-06

Chronic HI = (Emissions x X/Q x MET x MP)/Chronic REL

Pre-EPA Chronic Noncarcinogenic Risk by Target Organ

Toxic Air Contaminant	DEV	HEM	KID	NS	RESP
Benzene	2.68E-03	2.68E-03		2.68E-03	
Toluene	2.02E-04			2.02E-04	2.02E-04
Xylene, o-				2.39E-05	2.39E-05
Cadmium			1.37E-04		1.37E-04
Manganese				7.05E-05	
Nickel		2.32E-05			2.32E-05
	2.88E-03	**2.70E-03**	**1.37E-04**	**2.97E-03**	**3.86E-04**

EPA Phase II Chronic Risk Noncarcinogenic Risk by Target Organ

Toxic Air Contaminant	DEV	HEM	KID	NS	RESP
Benzene	2.02E-03	2.02E-03		2.02E-03	
Toluene	1.44E-04			1.44E-04	1.44E-04
Xylene, o-				2.20E-05	2.20E-05
Cadmium			2.86E-04		2.86E-04
Manganese				9.12E-05	
Nickel		3.65E-06			3.65E-06
	2.17E-03	**2.03E-03**	**2.86E-04**	**2.28E-03**	**4.56E-04**

Acute Non-Cancer Risk from Wood Burning Appliances

Pollutant	Pre EPA lb/hour	EPA Phase II lb/hour	Acute REL (ug/m3)	X/Q [(ug/m3)/ (lb/hr)]	AF Avg Over Hours > 1	Pre-EPA Acute HI	EPA Phase II Acute HI
Benzene	7.48E-03	5.65E-03	1,300	2000	0.83	9.55E-03	7.21E-03
Toluene	2.82E-03	2.01E-03	37,000	2000	1	1.52E-04	1.08E-04
Methyl Ethyl Ketone	1.12E-03	2.39E-04	13,000	2000	1	1.72E-04	3.68E-05
o-Xylene	7.79E-04	7.18E-04	22,000	2000	1	7.08E-05	6.52E-05
Nickel*	5.40E-08	8.49E-09	6	2000	1	1.80E-05	2.83E-06

Acute HI = (Emissions x X/Q x AF)/Acute REL

Pre-EPA Acute Non-Cancer Risk by Target Organ

Toxic Air Contaminant	DEV	EYE	HEM	IMM	NS	REP	RESP
Benzene	9.55E-03		9.55E-03	9.55E-03		9.55E-03	
Toluene	1.52E-04	1.52E-04			1.52E-04	1.52E-04	1.52E-04
Methyl ethyl ketone		1.72E-04					1.72E-04
Xylene, o-		7.08E-05					7.08E-05
Nickel				1.80E-05			1.80E-05
	9.70E-03	**3.95E-04**	**9.55E-03**	**9.57E-03**	**1.52E-04**	**9.70E-03**	**4.13E-04**

EPA Phase II Acute Non-Cancer Risk by Target Organ

Toxic Air Contaminant	DEV	EYE	HEM	IMM	NS	REP	RESP
Benzene	7.21E-03		7.21E-03	7.21E-03		7.21E-03	
Toluene	1.08E-04	1.08E-04			1.08E-04	1.08E-04	1.08E-04
Methyl ethyl ketone		3.68E-05					3.68E-05
Xylene, o-		6.52E-05					6.52E-05
Nickel				2.83E-06			2.83E-06
	7.32E-03	**2.10E-04**	**7.21E-03**	**7.22E-03**	**1.08E-04**	**7.32E-03**	**2.13E-04**

COMMERCIAL FACILITY CONTRUCTION EMISSIONS

EMFAC2007 Emission Factors

Pollutant	Heavy Duty Diesel Truck EF, lb/VMT	Automobile EF, lb/VMT
VOC	0.003729485	0.000912301
CO	0.014462366	0.010138399
NOx	0.047181664	0.001471073
Total PM10	0.002308998	0.000102857
PM2.5	0.002124278	9.54517E-05
SOx	3.96152E-05	1.05917E-05

Source: Burden2007, South Coast Air Basin, 2007 fleet year
PM2.5 estimated from PM10 using the ARB CEIDARS database: PM2.5 fraction of PM10 for diesel trucks is 0.92; PM2.5 fraction of PM10 for automobiles 0.928.

Description	Value
Annual Units Replaced	250
Daily Units Replaced	1
Daily One-Way Trips	2
One-Way VMT	20

- Daily units replaced = (Annual units replaced)/(52 week/year)/(5 day/week)
- Daily units replaced x 2 deliveries x 1.1 fluctuation factor

Emissions and Impacts

Pollutant	Diesel Truck	Automobile	Total	Significance Threshold
VOC, lb/day	0.3	0.1	0.37	75
CO, lb/day	1.2	0.8	1.97	550
NOx, lb/day	3.8	0.1	3.89	100
PM10, lb/day	0.2	0.01	0.19	150
PM2.5, lb/day	0.2	0.01	0.18	55
SOx, lb/day	0.0032	0.0008	0.004	150

- Daily one-way trips x one-way VMT x EF, lb/VMT x 2 one-way trips

Assumes
- 20 mile one-way trip, 40 mile round trip
- The number of units replaced is the annual number of trips divided by 52 weeks/year and 5 days/week.
- Daily trips include two 2-way trips per replacement (one 2-way trip for disposal of old unit and one 2-way trip for delivery of new unit). To be conservative the average number of trips were multiplied by 1.1 since deliveries will fluctuate.

RESIDENTIAL CONSTRUCTION EMISSIONS

EMFAC2007 Emission Factors

Pollutant	Heavy Duty Diesel Truck EF, lb/VMT	Automobile EF, lb/VMT
VOC	0.003729485	0.000912301
CO	0.014462366	0.010138399
NOx	0.047181664	0.001471073
Total PM10	0.002308998	0.000102857
PM2.5	0.002124278	9.54517E-05
SOx	3.96152E-05	1.05917E-05

Source: Burden2007, South Coast Air Basin, 2007 fleet year
PM2.5 estimated from PM10 using the ARB CEIDARS database: PM2.5 fraction of PM10 for diesel trucks is 0.92; PM2.5 fraction of PM10 for automobiles 0.928.

Description	Value
Annual Units Replaced	2,741
Daily Units Replaced	11
Daily One-Way Trips	24
One-Way VMT	20

- Daily units replaced = (Annual units replaced)/(52 week/year)/(5 day/week)
- Daily units replaced x 2 deliveries x 1.1 fluctuation factor

Emissions and Impacts

Pollutant	Diesel Truck	Automobile	Total	Significance Threshold
VOC, lb/day	3.6	0.9	4.5	75
CO, lb/day	13.9	9.7	23.6	550
NOx, lb/day	45.3	1.4	46.7	100
PM10, lb/day	2.2	0.1	2.3	150
PM2.5, lb/day	2.0	0.1	2.1	55
SOx, lb/day	0.0	0.0	0.0482	150

- Daily one-way trips x one-way VMT x EF, lb/VMT x 2 one-way trips

Assumes
- 20 mile one-way trip, 40 mile round trip
- The number of units replaced is the annual number of trips divided by 52 weeks/year and 5 days/week.
- Daily trips include two 2-way trips per replacement (one 2-way trip for disposal of old unit and one 2-way trip for delivery of new unit). To be conservative the average number of trips were multiplied by 1.1 since deliveries will fluctuate.

NATURAL GAS USAGE ESTIMATES

Natural Gas Usage

Year	2007 AQMP Number of Wood Burning Devices	Annual Operation Hours	Avg Rating, Btu/hr	Usage, cft/hr	Usage, MMcft/day	Usage, MMcft/year
2008	14,608	492,431	60,000	59	0.051	29.0
2009	14,828	500,640	60,000	59	0.052	29.4
2010	15,052	509,004	60,000	59	0.053	29.9
2011	14,606	537,548	60,000	59	0.051	31.6
2012	14,826	546,840	60,000	59	0.052	32.2
2013	15,049	556,305	60,000	59	0.053	32.7
2014	15,277	565,948	60,000	59	0.053	33.3
Total 2008-2014	104,247	-	-	-	0.365	218
Maximum 2008-2014	15,277	-	-	-	0.053	33.3

- Number of units - 2007 AQMP
- Annual operation pours
- Average rating, btu/hr from Staff Report
- Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)
- Duration - length of fireplace use from Staff Report
- Usage, MMcft/day = (Number of Units x Usage, cft/hour x Duration, hour/day)/1,000,000 cft/MMcft

~~Average Natural Gas Usage by 2014~~

~~Description~~	~~Number of Units~~	~~Avg Rating, Btu/hr~~	~~Usage, cft/hr~~	~~Duration, hour/day~~	~~Duration, hour/year~~	~~Usage, MMcft/day~~	~~Usage, MMcft/year~~
~~New Units~~	~~35,861~~	~~40,000~~	~~39~~	~~3.5~~	~~212~~	~~4.92~~	~~298.1~~
~~Commercial Replacement~~	~~250~~	~~40,000~~	~~39~~	~~3.5~~	~~840~~	~~0.03~~	~~8.2~~
~~**Total**~~						~~**5.0**~~	~~**306**~~

~~Maximum Natural Gas Usage by 2014~~

~~Description~~	~~Number of Units~~	~~Maximum Rating, Btu/hr~~	~~Usage, cft/hr~~	~~Duration, hour/day~~	~~Duration, hour/year~~	~~Usage, MMcft/day~~	~~Usage, MMcft/year~~
~~New Units~~	~~35,861~~	~~60,000~~	~~59~~	~~3.5~~	~~212~~	~~7.38~~	~~447.2~~
~~Commercial Replacement~~	~~250~~	~~60,000~~	~~59~~	~~3.5~~	~~840~~	~~0.05~~	~~12.4~~
~~Total~~						**~~7.4~~**	**~~460~~**

~~Average Natural Gas Usage by 2022~~

~~Description~~	~~Number of Units~~	~~Average Rating, Btu/hr~~	~~Usage, cft/hr~~	~~Duration, hour/day~~	~~Duration, day/year~~	~~Usage, MMcft/day~~	~~Usage, MMcft/year~~
~~New Units~~	~~76,845~~	~~40,000~~	~~39~~	~~3.5~~	~~212~~	~~10.55~~	~~638.9~~
~~Commercial Replacement~~	~~250~~	~~40,000~~	~~39~~	~~3.5~~	~~840~~	~~0.03~~	~~8.2~~
~~Residential Replacement~~	~~27,410~~	~~40,000~~	~~39~~	~~3.5~~	~~212~~	~~3.76~~	~~227.9~~
~~Total~~						**~~14.3~~**	**~~875~~**

~~Maximum Natural Gas Usage by 2022~~

~~Description~~	~~Number of Units~~	~~Maximum Rating, Btu/hr~~	~~Usage, cft/hr~~	~~Duration, hour/day~~	~~Duration, day/year~~	~~Usage, MMcft/day~~	~~Usage, MMcft/year~~
~~New Units~~	~~76,845~~	~~60,000~~	~~59~~	~~3.5~~	~~212~~	~~15.82~~	~~958.3~~
~~Commercial Replacement~~	~~250~~	~~60,000~~	~~59~~	~~3.5~~	~~840~~	~~0.05~~	~~12.4~~
~~Residential Replacement~~	~~27,410~~	~~60,000~~	~~59~~	~~3.5~~	~~212~~	~~5.64~~	~~341.8~~
~~Total~~						**~~21.5~~**	**~~1,312~~**

~~- Duration, day/year = (0.28 cords of wood burnt/year)(1,400 kg/cord)/(3.5 kg of wood burnt/hour) = 112 hour/year where kg pf wood burnt/time values are from Houck, 2006.~~
~~- Staff Report for PR 445, Appendix C, 7 hour/day x 120 day/year = 840 hour/year~~
~~- Range of wood burning heaters - 20,000 to 60,000 Btu/hr~~
~~- Usage, cft/hr = (Rating, Btu/hr)/(1,020 Btu/cft)~~
~~- Duration - length of fireplace use~~
~~- Usage, MMcft/day = (Number of units x Usage, cft/hour x Duration, hour/day)/1,000,000 cft/MMcft~~
~~- Usage, MMcft/year = Usage, MMcft/day x Duration, day/year~~

ELECTRIC USAGE

Electric Usage

Year	2007 AQMP Number of Wood Burning Devices	Number of Electric Devices	Electric Rating, W-hr/hr	Usage, MMW/day
2008	14,608	146	2,600	0.38
2009	14,828	148	2,600	0.39
2010	15,052	151	2,600	0.39
2011	14,606	146	2,600	0.38
2012	14,826	148	2,600	0.39
2013	15,049	150	2,600	0.39
2014	15,277	153	2,600	0.40
Total 2008-2014	104,247	1,042		2.71

- Number of wood burning devices estimated by 2007 AQMP
- Number of electric devices assumed to be one percent based on conversation with inspectors
- Electric Rating, W-hr/hr from http://www.heatnglo.com/downloads/installManuals/4030_781.pdf.
- MMW/day = (Number of Units x Electric Rating, W-hr/hr)/1,000,000 watts/megawatts

~~Electric Usage by Ancillary Equipment on Wood Burning and Natural Gas Appliances by 2014~~

~~New Units~~	~~Number of Units~~	~~Electric Rating, kW-hr/hr~~	~~Duration, hour/day~~	~~Duration, hour/year~~	~~Usage, MMW-hr/day~~	~~Usage, MMW-hr/year~~
~~New Units~~	~~35,861~~	~~0.38~~	~~3.5~~	~~212~~	~~47.70~~	~~2,889~~
~~Commercial Replacement~~	~~250~~	~~0.38~~	~~3.5~~	~~840~~	~~0.33~~	~~80~~
~~Total~~					**~~48.0~~**	**~~2,969~~**

~~- Electric rating - 0.38 kw-hr/hr for pellet heaters, 0.144 kw for EPA certified Phase II inserts.~~
~~- Usage, MMW/day = (Number of units x Usage, kW-hr/hour x Duration, hour/day)/1,000 MMhr/kW~~
~~- Usage, MMW-hr/year = Usage, MMW-hr/day x Duration, day/year~~

Electric Usage by Ancillary Equipment on Wood Burning and Natural Gas Appliances by 2022

Description	Number of Units	Electric Rating, kW-hr/hr	Duration, hour/day	Duration, day/year	Usage, MMW-hr/day	Usage, MMW-hr/year
New Units	76,845	0.38	3.5	212	102.20	6,191
Commercial Replacement	250	0.38	3.5	840	0.33	80
Residential Replacement	27,410	0.38	3.5	212	36.46	2,208
Total					**139.0**	**8,479**

Electric Usage by Electric Fireplaces

Description	Number of Units	Electric Rating, W-hr/hr	Usage, MMW/day
New Units 2012	256	2,600	0.67
New Units 2014	1,792	2,600	4.66
New Units 2022	3,840	2,600	9.98

Electric Rating, W-hr/hr from http://www.heatnglo.com/downloads/installManuals/4030_781.pdf.
Usage, MMW/day = (Number of Units x Electric Rating, W-hr/hr)/1,000,000 watts/megawatts

Estimate of Propane Usage from Wood Usage

Propane Heat Value, Btu/gallon	Wood Heat Value, Btu/cord	Usage, cord wood/ gal LPG	Volume of Cord, cft	Conversion Factor, gal/cft	Usage, cft wood/ cft LPG
91,300	20,000,000	0.005	128	7.48	4.37

http://www.eia.doe.gov/glossary/glossary_b.htm
Usage, cord wood/gal LPG = Wood Heat Value, Btu/cord/Propane Heat Value, Btu/gallon
Usage, cft wood/cft LPG = Usage, cord wood/gal LPG x Volume of Cord, cft x Conversion Factor, gal/cft

~~SOLID WASTE DISPOSAL ESTIMATES~~

~~Description~~	~~Units Replaced~~	~~Unit Weight, lb~~	~~Weight Disposed, tons~~
~~Commercial Replacement~~	~~250~~	~~210~~	~~26~~
~~Residential Replacement~~	~~27,414~~	~~210~~	~~2,878~~

~~- Assumes that all non-compliant devices removed are wood stoves. Unit weight = Stove weight http://www.thelinco.com~~
~~- Weight Disposed, tons = (Unit Weight, tons x Units Replaced)/2,000 lb/ton~~

APPENDIX C

COMMENT LETTER AND RESPONSE TO COMMENT

City of Seal Beach

CITY HALL 211 EIGHTH STREET
SEAL BEACH, CALIFORNIA 90740
(562) 431-2527 • www.ci.seal-beach.ca.us

March 15, 2007

RECEIVED
MAR 20 2007

South Coast Air Quality Management District
Attn: Mr. James Koizumi
21865 Copley Drive
Diamond Bar, California 91765-4182

Dear Mr. Koizumi:

SUBJECT: **DRAFT ENVIRONMENTAL ASSESSMENT RE: PROPOSED RULE 445 – WOOD BURNING APPLIANCES**

On behalf of the City of Seal Beach, Mr. Lee Whittenberg, Director of Development Services, has read the above referenced Draft Environmental Assessment and proposed rule and felt that is important for our community to provide comments absent the ability of our Environmental Quality Control Board or City Council to formally consider the referenced documents due to conflicts with our local meeting schedules and the comment deadline on the environmental document.

This proposed rule will prohibit the installation of a new wood burning appliance unless they comprise the cleanest technologies available 6 months after formal rule adoption by the SCAQMD and establishes other compliance dates between now and 2012 to achieve the desired reductions in particulate matter (PM). Proposed Rule 445 is included within the 2003 AQMP as control measure MSC-06 and is also included in the draft 2007 AQMP as control measure BCM-03. 1-1

The Draft Environmental Assessment discusses the health effects from PM, and in particular, wood smoke on pages 1-6 and 1-7. This discussion clearly indicates that "*Persons that may be more susceptible to health effects from wood smoke include those with existing heart or lung disease (congestive heart failure, angina, chronic obstructive pulmonary disease, emphysema, or asthma), the elderly, and the young*".

A large portion of Seal Beach is developed with a 7,700 person senior living community, Seal Beach Leisure World. Leisure World comprises approximately 6,000 housing units,

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with a population of approximately 6,600 persons 65 or older, or approximately 86.5% of the total population of Leisure World.

The Draft Environmental Assessment indicates in Table 1-11 that "Total Daily Criteria Pollutant Emission Reductions by 2014" in pounds are estimated to be:

- PM10 11,301
- PM2.5 10,883
- CO 83,940
- VOC 6,231
- NOX 929
- SOX 150

1-1
Cont

The impacts of the above noted potential reduction of particulate emissions and emissions of other criteria pollutants upon our community, and particularly within the Leisure World retirement community are of extreme concern to our citizens.

I, therefore, urge your Board to approve the subject environmental assessment and to proceed as expeditiously as possible towards the adoption of proposed Rule 445. The long-term health benefits to the citizens of Southern California, and in particular to our residents in Leisure World are of the utmost importance to us all.

Please contact Mr. Lee Whittenberg, Director of Development Services, at (562) 431-2527, extension 313, or by e-mail at lwhittenberg@ci.seal-beach.ca.us if you have any questions regarding this matter or require additional information from Mr. Whittenberg.

Sincerely,

Greg Beaubien
Interim City Manager
City of Seal Beach

Distribution:

City Council
Planning Commission
Environmental Quality Control Board

Director of Development Services

Responses to Comment Letter #1
City of Seal Beach
March 15, 2007

Response 1-1
SCAQMD staff thanks the City of Seal Beach for their support of PR 445. The proposal will be presented to the SCAQMD Governing Board at the March 7, 2008 meeting.