APPENDIX G

FINAL SUBSEQUENT ENVIRONMENTAL ASSESSMENT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

to EA and AMP

Final Subsequent Environmental Assessment for:

Proposed Amended Rule 1113 - Architectural Coatings

AQMD No. 960626DWS

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PREFACE

This document constitutes the Final Subsequent Environmental Assessment (SEA) for the amendment to Rule 1113. The Draft SEA was released for a 45-day public review and comment period that ended August 16, 1996. Five comment letters from the public were received. These comment letters and responses to comments are in Appendix G. Also contained in Appendix G, at the request of some commentators, are responses to oral and written comments received from and at the Public Workshops held on September 5, 1996, July 17, 1996, and May 24, 1996. Minor modifications have been made to the Draft SEA such that it is now a Final SEA. Modifications are denoted using ~~strikethrough~~ and *italics*, respectively.

INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA) (California Public Resources Code Section 21000 et seq.), this document includes an analysis of the potential environmental impacts of implementing proposed amended Rule (PAR) 1113 - Architectural Coatings. Rule 1113 regulates the allowable volatile organic compound (VOC) content of architectural coatings. PAR 1113 implements, in part, the 1994 Air Quality Management Plan (AQMP) Control Measure - CM #94CTS-07.

These amendments to Rule 1113 are designed to reduce the VOC content limits of four coating categories: lacquers, flats (interior and exterior), traffic coatings, and multi-color coatings, which are expected to result in a reduction of VOC emissions from this source category. In addition, PAR 1113 would temporarily increase the VOC content limits for four coating categories. Other components of the proposed amendments include addition of and modification to some definitions, updating the analytical test methods, and establishing an averaging methodology *for flats* to provide flexibility for complying with *future* VOC content limits ~~for flats can be demonstrated~~.

The potential impacts associated with adoption of the proposed amendments and several project alternatives are analyzed in this Final Draft Subsequent Environmental Assessment (SEA). Specific environmental areas examined include air quality, water quality, hazards (human health), and public services impacts to fire departments. In October 1995, acetone was removed from the list of VOCs pursuant to South Coast Air Quality Management District (AQMD) Rule 102 - Definition of Terms. As a result, several coating formulators have indicated that they will use acetone to replace other solvents in their solvent-based formulations. The potential impacts of increased acetone use in the formulation of coatings are analyzed and discussed in this SEA.

Five comment letters were received on the Draft SEA during the 45-day public review period that ended on August 16, 1996. Detailed responses to all comments received on the Draft SEA and for certain commentators at their request oral and written comments received after and during the Public Workshops held on September 5, 1996, July 17, 1996 and May 24, 1996 are included in Appendix G of this Final SEA.

SUMMARY OF CHAPTER 1 - LEGISLATIVE REQUIREMENTS

The California Legislature created the South Coast AQMD in 1977 (Lewis-Presley Air Quality Management Act, Health and Safety Code Sections 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations within the South Coast AQMD's area of jurisdiction. By statute, the AQMD is required to adopt

an Air Quality Management Plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the South Coast AQMD's jurisdiction [Health and Safety Code Section 40460(a)]. Furthermore, the AQMD must adopt rules and regulations that carry out the AQMP [Cal. Health and Safety Code, Section 40440(a)]. Amending Rule 1113 carries out in part the AQMD's mandate to implement the AQMP.

Notice of Preparation/Initial Study

A Notice of Preparation and Initial Study (NOP/IS) for this Final ~~Draft~~ Subsequent Environmental Assessment (included as Appendix D) were distributed to responsible agencies and interested parties for a 30-day review and comment period ending June 4, 1996. The NOP/IS identified potential adverse impacts for the following environmental topics: air quality and odor; water resources; human health/hazards; and public services.

Two comment letters were received on the NOP/IS during the 30-day public review period. Detailed responses to all comments received on the Initial Study and during the Public Workshop held on May 24, 1996 are included in Appendix A of this Final Draft SEA.

SUMMARY OF CHAPTER 2 - PROJECT DESCRIPTION AND EXISTING SETTING

Project Description

The project objective of PAR 1113 is to reduce VOC emissions from architectural coatings through lowering the VOC content limit of various coating categories. Through lowering the VOC content of architectural coatings, the AQMD is implementing AQMP control measure CM #94CTS-07. According to the 1994 AQMP, it is necessary to implement all control measures identified therein, if the areas within the AQMD's jurisdiction are to attain and maintain the state and federal ambient air standards as required by the California and federal Clean Air Acts. Amending Rule 1113 contributes toward these goals.

The proposed amendments implement control measure CM #94CTS-07, by lowering the allowable VOC content limits for the coating categories of lacquers, flats, traffic coatings, and multi-color coatings. In addition, the amendments will raise the limits for the coating categories of japans, magnesite coatings, ~~tub-and-sink-repair-coatings~~, and fireproofing coatings. Other components of the proposed amendments include the addition of and modification to some definitions, allowing an averaging provision *for flats to allow flexibility in complying with future VOC content limits* for compliance, conducting a

technical assessment one year prior to each of the effective dates for VOC content limits, and updating the analytical test methods.

Alternatives

This Final Draft SEA provides a discussion of feasible alternatives to the proposed project which would substantially reduce potential adverse impacts as required by AQMD Rule 110. Six alternatives were considered and are briefly explained below.

Alternative A - No Project

This alternative assumes the proposed amendments to Rule 1113 will not be adopted. *This alternative would maintain the current version of the Rule 1113 as amended by the 1990 court order.*

Alternative B - No Emission Limit Changes for Lacquers

Alternative B would not call for a reduction of VOC content for lacquers beyond the current limit of 680 g/l. The other VOC content limit changes in PAR 1113 would be required.

Alternative C - No Emission Limit Changes for Flats

Alternative C would not call for a reduction of VOC content for flats beyond the current limit of 250 g/l. The other VOC content limit changes in PAR 1113 would be required.

Alternative D - No Interim Limits for Lacquers or Flats

Alternative D would omit the interim 550 g/l VOC content limit for lacquers in 1998 and would require these coatings to meet a 275 g/l VOC content limit in 2005. Also, this alternative would omit the interim 100 g/l VOC content limit for flats in 2001 and would require these coatings to meet a 50 g/l VOC content limit in 2008. The other proposed VOC content limit changes in PAR 1113 would be maintained.

Alternative E - No Emission Limit Changes for Lacquers and Flats

Alternative E would not require a reduction of VOC content for lacquers beyond the current limit of 680 g/l. Also, this alternative would not call for a reduction of VOC content for flats beyond the current limit of 250 g/l. The other VOC content limit changes in PAR 1113 would be maintained.

EXISTING SETTING

Air Quality (CO, NO_2, SO_2, Lead, Visibility)

Over the last decade and a half, there has been significant improvement in air quality in the AQMD's jurisdiction. Nevertheless, some air quality standards are still exceeded frequently and by a wide margin. Of the National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, and fine particulate matter [PM10]), the South Coast Air Basin's jurisdiction is only in attainment with the state and national sulfur dioxide standards. Chapter 2 provides a brief description of the states of air quality for each criteria pollutant, as well as the human health effects resulting from each pollutant.

Water Resources

The regulatory program to control water quality in the state includes the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB). These agencies have broad powers to protect ground and surface water supplies and to regulate waste disposal and hazardous waste cleanups. These agencies also regulate discharges to state waters through federal National Pollution Discharge Elimination System permits. Discharges to publicly-owned treatment works (POTWs) are regulated through federal pre-treatment requirements enforced by the POTWs.

Water sources for the district include local ground and surface waters, which supply about one-third of regional water demand, and supplemental sources, including the State Water Project and the Los Angeles Aqueduct, which supply the remaining two-thirds. Suppliers of supplemental water include the Metropolitan Water District of Southern California and the Los Angeles Department of Water and Power. In 1990, total water use in the district was 3.9 million acre-feet (MAF), or 1.3 trillion gallons. The major water resource alternative is reclaimed wastewater. The supply of reclaimed wastewater in 2010 is expected to equal about 20 percent of current water use.

Human Health/Hazards

Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions. Risk of upset is thus related to the production, use, storage, and transportation of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used on a consumable basis include fuels, solvents, and coatings. Hazardous materials are stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the District in great quantities via all modes of transportation including rail, highway, water, air and pipeline.

The California Hazardous Materials Incident Reporting System is a post-incident reporting system to collect data on incidences involving the accidental release of hazardous materials. Los Angeles, Riverside, San Bernardino, and Orange counties together account for 26 percent of the total incidents reported in the state in 1991.

Public Services - Fire Departments

These services are generally provided by city and county fire departments with some cities contracting with the county for services. The U.S. Forest Service provides fire protection on all national forest lands while the California Department of Forestry has jurisdiction over wild land fire protection in various unincorporated areas of Riverside and San Bernardino counties. The northeastern area of Los Angeles County is served by the Los Angeles County Department of Forestry. Approximately 17,914 personnel (1 employee per 765 civilians) were employed in fire protection within the four county region comprising the District.

SUMMARY OF CHAPTER 3 - ENVIRONMENTAL IMPACTS AND MITIGATION

Air Quality

Based on the preceding analysis of potential direct and indirect air quality effects of implementing PAR 1113, it is concluded that:

1. Increasing the VOC content of japans, magnesite coatings, ~~tub-and-sink repair coatings~~, and fire-proof coatings will result in an VOC emission increase of 200 pounds per day. As a result, air quality impacts are considered significant.

2. Once the lower VOC content limits are implemented the overall air quality effects of the PAR 1113 will be a VOC emission reduction of approximately *10.5*[1] ~~10.6~~ tons per day by the year 2010.

Seven areas of controversy were identified that could result in increased indirect VOC emissions due to a requirement to lower the VOC content of coatings. The seven alleged impacts (raised in the industry's prior litigation) are: increased coating thickness, more thinning, more topcoats, more touch-ups, more priming, more frequent recoating, and more reactivity. The first six areas of controversy all essentially assert that the new formulations, either solvent-based or water-based, result in more coating use resulting in an overall increase in VOC emissions for a specific area covered or over time. The seventh area of controversy involves the assertion that more reactive solvents will be used in the compliant reformulations than the solvents used in the solvent-based coatings.

Odor

The project will be considered to have significant odor impacts if objectionable odors are created from the implementation of the project. Acetone used as a replacement for other traditional solvents may have less odor impacts because it has a higher odor threshold than other solvent currently used in coatings.

[1] *During the course of finalizing the Draft SEA, AQMD staff discovered that the VOC emission reductions associated with the year 2001 flat VOC content limit of 100 g/l were over estimated by 0.10 ton per day. The correct VOC emission reduction estimate has been noted and corrected in the remaining sections of this Final SEA. This correction does not change any conclusions reached in the Draft SEA*

Given that PAR 1113 allows sufficient time for manufacturers to develop compliant flat coatings and solve any odor problems associated with these reformulated compliant coatings, no significant adverse odor impacts are expected from lowering the VOC content limits for flat coatings.

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Water Resources

Impacts on water resources are divided into two categories - water quality and water demand. Water impacts are considered significant if they cause changes in the course of water movements or of drainage or surface runoff patterns; substantially degrade water quality; deplete water resources; significantly increase toxic inflow to public waste water treatment facilities; or interfere with groundwater recharge efforts.

Water Quality

Based upon the preceding analyses, PAR 1113 is not expected to create significant adverse water quality impacts for the following reasons. Use of acetone to comply with the 1998 VOC content requirements for lacquers is expected to result in equivalent or lesser water quality impacts than currently used solvents because acetone volatilizes more rapidly and is, generally, more biodegradable. Further, because currently available flat coatings are already water based, no additional water quality impacts from future compliant flat coatings are expected because these coatings are also expected to be water based. Finally, PAR 1113 is not expected to promote the use of compliant coatings formulated with hazardous solvents that could create water quality impacts because state and federal regulations are expected to promote the use of coatings formulated with non-hazardous solvents. In addition, PAR 1113 allows sufficient time for research and development of coatings formulated with non-hazardous solvents.

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Water Demand

The MWD and other water providers are currently exploring various strategies for increasing water supplies and maximizing the use of existing supplies. Options include storage of water from existing sources, use or storage of water unused by other states or agricultural agencies, and advance delivery of water to irrigation districts. These

continuing and future water management programs assure that the area's full-service water demands will be met at all times.

No significant impacts are anticipated, therefore, no mitigation measures are necessary.

Human Health/Hazards

Human health/hazards impacts will be considered significant if any of the following criteria are met: the project results in a substantial number of people being exposed to a substance causing irritation; the project results in one or more people being exposed to a substance causing serious injury or death; or, for noncarcinogenic toxic chemicals emitted due to the proposed project, the estimated acute or chronic hazard index is greater than 5.0.

Human Health

The adoption of PAR 1113 is expected to result in acetone being used to replace solvents currently found in lacquer formulations. Those other solvents have much greater toxicity characteristics. As a result, no adverse human health impacts are expected.

The analysis of human health impacts from using reformulated architectural coatings containing toxic substances identified the maximum amount of coating that could be applied at a facility without exceeding the hazard index significance criteria of 5.0. This analysis is summarized and included in Appendix B. Based on this analysis, it is expected that significant adverse human health impacts would not occur as a result of using water-based compliant architectural coatings which comply with PAR 1113.

No significant impacts are anticipated, therefore, no mitigation measures are necessary.

Hazards

In addition to the fact that compliant acetone-formulated coatings will be replacing existing coatings that may also be formulated with hazardous solvents, acetone is only expected to be used in compliant coatings until the year 2005. At that time, lacquers complying with the 275 g/l VOC content requirements are expected to be reformulated with water. Since coating manufacturers have nearly nine years to research and develop 275 g/l lacquers, it is unlikely that they will be formulated with hazardous materials compared to currently used solvents. Based upon the preceding information, hazard impacts are not expected to be significant.

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Public Services - Fire Departments

The proposed project will be considered to have significant adverse impacts on fire departments if it would result in the need for new or altered fire department services.

Any increase in accidental releases of compliant coating materials would be expected to result in a concurrent reduction in the number of accidental releases of existing coating materials. Further, as demonstrated in the Human Health section, future compliant coating materials would be expected to be less hazardous than currently used coatings, so accidental releases would be expected to pose a lower risk to responding firefighters. Further, if manufactures continue to use solvents such as EGBE in their compliant water-based coatings, fire departments would not be expected to experience adverse impacts because EGBE or glycol ethers in general are less flammable than currently used solvents.

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

COMPARISON OF ALTERNATIVES

A matrix presented in Table ES-1, lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The Table also provides a comparison within each impact section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another

Columns with check marks denote whether a proposal has project specific adverse impacts or cumulative impacts or both. Columns that are blank denote that a proposal does not have project specific adverse impacts or cumulative impacts.

TABLE ES-1
Comparison of Impacts and Alternatives

Project/ Alternative	Air Quality Impacts		Odor Impacts		Water Quality Impacts		Water Demand Impacts		Human Health Impacts		Hazards Impacts		Fire Department Impacts	
	Sign. Impacts	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*
PAR 1113	✓(1)		(1)		(4)		(4)	✓	(1)	✓	(1)		(4)	
A	(3)		(6)		(1)		(1)		(6)		(4)	✓	(1)	
B	✓(3)		(5)		(2)		(2)	✓	(4)	✓	(4)	✓	(2)	
C	✓(1)		(1)		(4 3)		(4 3)	✓	(1)	✓	(1)	✓	(4)	
D	✓(3)		(5)		(4)		(4)	✓	(5)	✓	(5)	✓	(3)	
E	✓(3)		(4)		(3 4)		(3 4)		(5)	✓	(5)	✓	(1)	

Notes: The ranking scale is such that 1 represents the least impacts and subsequent higher number represent increasingly higher worst impacts.
The same two numbers in brackets for a specific impact Section means that these proposals would have the same impacts if implemented.
A check mark denotes either a significant adverse impact or cumulative impact.
A blank in a column denotes no significant adverse impact or no cumulative impact.

SUMMARY OF CHAPTER 4 - ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

Implementation of the proposed amendments is not expected to change existing business conditions within the district. It will not increase or decrease the number or type of businesses and consumers using architectural coatings. Therefore, AQMD staff has determined that there will be no significant impacts to the following environmental resources in the district:

- Land Use and Planning
- Population and Housing
- Geophysical
- Transportation/Circulation
- Biological Resources
- Energy and Mineral Resources
- Noise
- Utilities and Service Systems
- Aesthetics
- Cultural Resources
- Recreation
- Economic Impacts

OTHER CEQA TOPICS

This sections address various topics and issues required by CEQA such as growth inducement, short-term versus long-term effects, and irreversible changes.

CHAPTER 1

LEGISLATIVE REQUIREMENTS

LEGISLATIVE AUTHORITY

The California Legislature created the South Coast AQMD in 1977 (Lewis-Presley Air Quality Management Act, Health and Safety Code Sections 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations within the South Coast AQMD's area of jurisdiction. By statute, the AQMD is required to adopt an Air Quality Management Plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the South Coast AQMD's jurisdiction [Health and Safety Code Section 40460(a)]. Furthermore, the AQMD must adopt rules and regulations that carry out the AQMP [Cal. Health and Safety Code, Section 40440(a)]. Amending Rule 1113 carries out in part the AQMD's mandate to implement the AQMP.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 1113 is a "project" as defined by the California Environmental Quality Act (CEQA) (Cal. Public Resources Code Section 21000 et seq.). The AQMD is the lead agency for the project and is preparing appropriate environmental analysis pursuant to its certified regulatory program (AQMD Rule 110). California Public Resources Code Section 21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The AQMD's regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989.

Rule 110 requires an assessment of anticipated environmental impacts as well as an analysis of feasible methods to substantially reduce any significant adverse environmental impacts. To fulfill the purpose and intent of Rule 110, the AQMD has prepared this Final Draft SEA to address the potential environmental impacts associated with implementing PAR 1113. This Final Draft SEA is 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. In addition, as will be discussed later, this Final Draft SEA complies with a 1990 court order regarding lacquers.

Appendix D includes the Notice of Preparation and Initial Study which identifies environmental topics to be analyzed in this document. All comments received during the public comment period on the Initial Study as well as the May 24, 1996 public workshop are addressed in Appendix A of this Final Draft SEA.

PREPARATION OF A SUBSEQUENT ENVIRONMENTAL ASSESSMENT

As previously noted, the AQMD is required to prepare and adopt an AQMP containing strategies, i.e., control measures for attaining and maintaining all of the state and federal ambient air quality standards. The last AQMP was adopted in 1994. As part of that effort, a program EIR for the 1994 AQMP was prepared pursuant to CEQA Guidelines Section 15168(a)(3) because the AQMP is related to the issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program. The 1994 AQMP EIR evaluated all control measures contained in the plan, including CM #94CTS-07 which this project implements. That document found no significant environmental impacts associated with CM #94CTS-07 at that time. The proposed project has been modified from CM #94CTS-07, in that it includes proposals to relax certain existing VOC limits for architectural coatings. In addition, there have been advances in architectural coating technology, since 1994 which includes the use of acetone in place of other traditional solvents. This new information was not previously available for analysis in the 1994 AQMP program EIR. As a result, an Initial Study was prepared to examine the proposed project in light of the 1994 AQMP final program EIR. Based on that Initial Study, The AQMD has decided to prepare this *Final* ~~Draft~~ SEA.

CEQA DOCUMENTATION FOR RULE 1113 - ARCHITECTURAL COATINGS

This document constitutes a subsequent CEQA document *to the* 1994 AQMP Final program EIR and the February 1990 CEQA document for Rule 1113 and further complies with the Dunn Edwards court order.

Other CEQA Documents for Rule 1113

February 1990 - Determination of No Significant Impacts - Proposed Amendments to Rule 1113 - Architectural Coatings.

In February 1990, the AQMD Board adopted amendments to Rule 1113 - Architectural Coatings based on the California Air Resources Board (CARB) California and Air Pollution Control Officers Association (CAPCOA) Suggested Control Measure (SCM). The amendments eliminated exemptions for 11 categories of specialty coatings, leaving only exemptions for quart or smaller containers, and emulsion type bituminous pavement sealers; adopted lower VOC limits for 15 new coating categories; reduced the industrial maintenance coating categories from ten to three; established technology-forcing VOC limits for ten coating categories to go into effect on December 1, 1993, and reorganized the subdivisions of the rule.

The Court Order

This *Final* ~~Draft~~ SEA also complies with a court order issued in the 1990 Dunn-Edwards Corporation, et. al. v. SCAQMD case. That case challenged, in part, CEQA document prepared for prior amendments to Rule 1113 adopted in February 1990. Those amendments lowered VOC limits for four coating categories: industrial maintenance primers and topcoats; lacquers; quick-dry primers and sealers; and quick-dry enamels in addition to other coating categories that were not challenged. PAR 1113 affects clear and pigmented lacquers. The lawsuit alleged that the CEQA document was improper because of potential significant air quality impacts related to the seven alleged impacts arising from the implementation of these lower VOC limits. The AQMD prevailed on six of the seven alleged impacts, but the lower court requested the AQMD to further study whether or not illegal thinning of coatings in the field resulted in a negative air quality impact before readopting the February 1990 Amendments.

The prior higher limits for quick-dry primers, sealers and undercoaters will be reinstated as a result of the Superior Court judgment. This SEA also complies fully with the court order as to the reduction of the VOC limit for lacquers.

While the AQMD agreed to study the illegal thinning issue further, the plaintiff paint manufacturers appealed the court's decision to dismiss their claims regarding the six other potential air quality impacts. In 1993, the Court of Appeals in a published decision (Dunn-Edwards Corporation, et. al. v. SCAQMD) rejected the plaintiffs' appeal. Plaintiffs then appealed the appellate decision to the California Supreme Court which denied review on December 2, 1993.

Other Rule 1113 Amendments

August 1996 - These amendments will allow for the continued exemption from the VOC limits for coatings sold in containers one quart size or less. A *Final* ~~Draft~~ Environmental Analysis has been prepared for these amendments.

Rule 1113 has been amended a number of times since January 1, 1990, as summarized in the following bullet points. For each amendment described below a Notice of Exemption was prepared.

- **March 8, 1996** - These amendments established a definition for aerosol coatings consistent with the California Air Resource Board (CAR), revised

the definition of exempt compounds by referencing Rule 102 - Definition of Terms, and created an exemption for aerosol coatings.

- September 6, 1991- These amendments created a new coating category, low-solids stain, and also incorporated a calculation method for determining VOC content on a materials basis. The amendment also prohibited use of Group II exempt compounds, including ozone-depleting chlorofluorocarbons (CFCs) and several toxic solvents.
- December 7, 1990 - These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.
- November 2, 1990 - These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.
- February 2, 1990 These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.

CHAPTER 2

PROJECT DESCRIPTION AND EXISTING SETTING

PROJECT DESCRIPTION

Project Objectives

By statute, the AQMD is required to adopt or amend and enforce rules that will reduce air pollutant emissions in order to attain and maintain federal and state ambient air standards. In furtherance of that goal, the AQMD proposes to further regulate volatile organic compound (VOC) emissions from architectural coating operations. VOCs contribute to the formation of ozone which is a criteria pollutant. If the South Coast district is to comply with the state and federal ambient air quality standards for ozone, ozone precursors such as VOC and NOx must be reduced. VOCs react photochemically with oxides of nitrogen to form ozone, a strong oxidizer that irritates human tissue, damages plant life, and causes significant materials damage each year. VOCs can react also with each other in the atmosphere to form long chain molecules that contribute to PM10 formation, a criteria pollutant that also affects human health and limits visibility.

The project objective of PAR 1113 is to reduce VOC emissions from architectural coatings through lowering the VOC content limit of various coating categories. Through lowering the VOC content of architectural coatings, the AQMD is implementing AQMP control measure CM #94CTS-07. According to the 1994 AQMP, it is necessary to implement all control measures identified therein, if the areas within the AQMD's jurisdiction are to attain and maintain the state and federal ambient air standards as required by the California and federal Clean Air Acts. Amending Rule 1113 contributes toward these goals.

Background

Architectural and Industrial Maintenance (AIM) coatings are used to beautify and protect homes, office buildings, factories, and their appurtenances on a variety of surfaces - metal, wood, plastic, concrete, wallboard, etc. For example, AIM coatings are applied to the interior and exterior of homes and offices, factory floors, bridges, stop signs, roofs, swimming pools, driveways, etc. AIM coatings may be applied by do-it-yourselfers, painting contractors, or maintenance personnel using a brush, roller or spray gun.

AIM coatings, as well as other coatings, are composed of: binders (resins) to hold the coating together; carriers (solvents) to reduce the coating viscosity and make it possible to apply, pigments to provide color, and specialty chemicals necessary for other coating characteristics. The carriers and some specialty chemicals evaporate, leaving behind the film-forming components of the coating. The resins used in AIM coatings include acrylics, vinyls, alkyds, cellulosics, epoxies, urethanes, polyurethanes and several other compounds. The carriers in solvent-based coatings are organic solvents such as alcohols,

ketones, esters, glycols, glycol ethers, and aromatic or aliphatic hydrocarbons, and are usually VOCs. The carrier in a water-based coating is water, although most water-based coatings contain some VOCs, primarily glycols, as coalescing solvents.

Because AIM coating surfaces cannot be painted within an enclosure vented to an air pollution control device, the only cost-effective method to control VOC emissions from AIM coatings is to reduce the VOC content of the coating.

Lacquers

Lacquers are clear or pigmented coatings applied to wood substrates to complete the wood finishing system and are commonly known as topcoats. Nitrocellulose and cellulose acetate butyrate are the most common film forming ingredients found in traditional lacquers. Over the past few years, other compositions for topcoats have been developed, including vinyl and modified nitrocellulose resins. Manufacturers of wood finishes have also evaluated other types of coatings, mostly due to the increasing cost of organic solvents. These alternatives include water-reducible resins, low solvent and solvent-free polyesters, cross-linked acrylic copolymers, and chemically modified polyurethane resins. These new formulations are still referred to as lacquers or synthetics. More recently with the addition of acetone to the list of exempt compounds, wood coating manufacturers have successfully formulated topcoats using acetone as the primary solvent. The use of acetone has resulted in not only lowering the VOC content, but has also, in most instances, replaced more toxic constituents such as toluene, xylene, and methyl ethyl ketone (MEK). Coatings formulated with acetone dry faster than traditional coatings.

The AQMD is proposing to readopt the lowered VOC content limit of 550 g/l for lacquers (from 680 g/l) set aside in 1990 by the Superior Court. This readopted limit would not be effective until January 1, 1998. The limit would be further lowered to 275 g/l effective January 1, 2005. This proposal is based on extensive research conducted as part of the rule development process for Rule 1136 - Wood Products Coatings, the record of which is incorporated by reference, which indicates that lacquers can be successfully reformulated with acetone to meet the interim 550 g/l VOC limit and with water to meet the 275 g/l final VOC limit. Currently, there are several compliant products on the market which meet both of these limits.

As part of the AQMD's fact finding and data gathering phase of both the Rule 1136 and Rule 1113 amendment process, staff conducted site visits to various locations where lower-VOC, compliant coatings are being utilized. Staff was able to observe on a first-hand basis, the challenges and issues related to use of the lower-VOC coatings including thinning practices. The data gathered from those staff surveys and site visits and subsequent research form the basis for the recommendation to lower the VOC limits for lacquers at this time. This proposal would also provide consistency between the two rules

such that architectural coatings applicators (covered under Rule 1113) would not have a competitive advantage over wood furniture coating applicators regulated by Rule 1136.

Flats

Flats are interior and exterior coatings that have a gloss of less than 15 on an 85 degree meter or less than 5 on a 60 degree meter. Flat coatings represent the largest category of architectural coatings and make-up approximately 80 to 90 percent of total coatings used for residential development. Flat coatings are used for interior and exterior walls and ceilings, and may be applied over previously painted surfaces; wallboard, plaster, primed wood, primed metal, masonry, and most wallpapers.

Flat coating formulations mainly consist of latex or acrylic resin systems. Latex resins are typically a water-reducible type of resin or binder that can be thinned with water and do not require petroleum-based solvents for clean-up. However, conventional latex coatings rely on addition of some petroleum-based solvent for acceptable drying characteristics and are considered to be limited in their durability. In contrast, acrylic-based coatings can be formulated without any co-solvents, and exhibit better durability and dry time properties than latex-based coatings. The acrylic-based coatings coalesce as they dry, resulting in a film with very tiny holes, thereby drying the coating within a shorter period of time.

The AQMD is currently proposing to lower the VOC content limit for flats from 250 g/l to 100 g/l, effective July 1, 2001. The limit would be further lowered to 50 g/l effective July 1, 2008. This proposal is based on the expected advances in the state of flat coatings technology in the future. Currently, there are more than 100 different flat coatings that comply with the 100 g/l proposed limit and five manufacturers currently offer zero-VOC coatings. These zero-VOC flat coatings are currently offered by The Glidden Company, Benjamin Moore Paints, Frazee Paint, AFM, and Republic Paints. However, industry has argued that these low-VOC and zero-VOC flats cannot be used in all coating situations because they may not provide the desired performance characteristics for that particular situations. To address those concerns, this project was modified to incorporate additional time necessary to develop compliant flats that can achieve the desired performance characteristics. Manufacturers may also comply with the lower VOC content limits for flats by using an averaging concept.

Traffic Coatings

Traffic coatings, more commonly referred to as marking materials, are used to provide lane delineation and other traffic guidance and information (turn arrows, parking spaces, crosswalks, railroad markings, special lanes, etc.). Typical users include state and local highway maintenance crews and contractors during new construction and maintenance of roads and parking lots.

The AQMD is currently proposing to lower the VOC content limit for traffic coatings from 250 g/l to 150 g/l, effective January 1, 1998. AQMD staff has found 20 coatings that comply with the proposed 150 g/l VOC limit. Although no single traffic marking material is the most desirable in all applications, a combination of low- and zero-VOC-emitting marking materials can provide the performance necessary for highway safety. Overall annualized costs of using water-based and zero-VOC coatings are lower than their solvent-based counterparts.

Multi-Color Coatings

Multi-color coatings are used as a substitute to wallpaper in offices, hotels, and hospital areas. These coatings consist of suspended particles or globules of various pigments in one container, which can be sprayed in a single application to produce a textured surface. The original formula for multi-color coatings was based on alkyd and lacquer resin technology. Significant advancements have been made within the last several years in utilizing a modified acrylic resin system to develop water-based formulations that perform as well as the solvent-based formulations. These second generation water-based multi-color coatings do not have any of the color bleeding problems found in earlier formulations.

The AQMD is currently proposing to lower the VOC content limit for multi-color coatings from 420 g/l to 250 g/l, effective January 1, 1998. Two of the largest manufacturers of multi-color coatings were selling non-compliant coatings under a variance for the past year. However, the largest manufacturer, with over 70 percent of the market share, has successfully formulated a water-based coating that performs as well as their solvent-based formulations. They have found wide commercial acceptance, especially in hotels, healthcare facilities, and office complexes, where solvent odor is a major concern since these lower VOC coatings have minimal odors. The new water-based coatings have a VOC content of approximately 100 g/l, well below the required 250 g/l. The other major manufacturer has also successfully developed a water-based formulation and has been marketing the product for over two years.

Proposed Amendments

The proposed amendments to Rule 1113 would lower the VOC content limits for some coating categories and temporarily increase the VOC content limits for other coating categories. Other components of the proposed amendments include addition of and modification to some definitions, updating the analytical test methods, establishing an averaging methodology *for flats* by which compliance with *future* VOC content limits can be demonstrated, and conducting a technical assessment one year prior to each of the effective dates for VOC content limits. The main components of PAR 1113 are summarized below. A complete version of PAR 1113 is contained in Appendix E.

The following VOC limits are proposed to be reinstated, pursuant to the Superior Court judgment:

- Reinstate the current VOC limits for industrial maintenance primers and topcoats at 420 g/l;
- Reinstate the current VOC limit for quick-dry enamels at 400 g/l; and
- Completely eliminate any VOC limitations for quick dry primers and sealers.

The following VOC limits would be lowered under the proposed amendments:

- Readopt the 550 g/l VOC limit from lacquer at 680 grams of VOC per liter of coating (g/l) effective January 1, 1998 and further reduce the VOC content limit to 275 g/l, effective January 1, 2005. Also, to further address industry concerns regarding the 550 g/l limit, the project was modified to allow the addition of a maximum of ten percent retarder on humid days to prevent blushing;
- Lower the VOC limit for flats (interior and exterior) from 250 g/l to 100 g/l, effective July 1, 2001 and further reduce the VOC content limit to 50 g/l, effective July 1, 2008;
- Lower the VOC limit for traffic coatings from 250 g/l to 150 g/l, effective January 1, 1998.
- Lower the VOC limit for multi-color coatings from 420 g/l to 250 g/l, effective January 1, 1998; and

The following amendments to would temporarily increase the VOC limits for certain specialty coating categories that are currently under variance because compliant coatings are currently unavailable with the current VOC limit:

- Temporarily increase the VOC limit for japans from 350 g/l to 450 g/l, returning to the 350 g/l VOC limit effective January 1, 1999;
- Temporarily increase the VOC limit for magnesite cement coatings from 450 g/l to 600 g/l, returning to the 450 g/l VOC limit effective January 1, 1999;
- ~~Temporarily increase the VOC limit for tub and sink repair coatings from 340 g/l to 420 g/l, returning to the 340 g/l VOC limit effective January 1, 1999.~~

Recently, the major manufacturer of tub and sink repair coatings has informed AQMD staff that they no longer need a variance from the current 340 g/l VOC content limit. They have indicated that they are now in compliance with the limit. Therefore, the proposal to temporarily increase the current VOC content limit from 340 g/l to 420 g/l has been abandoned and will not be part of the proposed project (PAR 1113). The removal of the tub and sink repair coatings has no effect on air quality. The emissions associated with this category are negligible due to the small volume of these coatings used.

- Temporarily increase the VOC content limit for exterior fire-proofing coating from 350 g/l to 450 g/l, returning to the 350 g/l VOC limit effective January 1, 1999;

In addition, staff has reorganized the coating categories in the Table of Standards into alphabetical order, eliminated some coating categories that have been at the default 250 g/l limit of paragraph (c)(1) for at least three years and consolidated similar categories with the same VOC content. Table 2-1, lists the proposed limits and their effective compliance dates.

TABLE 2-1
PAR 1113 VOC Limits[a]

Coating Category	Current VOC Limit (gram/liter)	Proposed VOC Limit (gram/liter)	Effective Date
Lacquers	680	550	01/01/98
		275	01/01/2005
Flats (Interior/Exterior)	250	100	07/01/2001
		50	07/01/2008
Traffic Coatings	250	150	01/01/98
Multi-Color Coatings	420	250	01/01/98
Japans	350[b]	450	*upon adoption* 09/14/96
		350	01/01/99
Magnesite Cement Coatings	450	600	*upon adoption* 09/14/96
		450	01/01/99
~~Tub & Sink Repair~~	~~420[c]~~	~~420~~	~~09/14/96~~
		~~340~~	~~01/01/99~~
Fire-Proof Coatings (Exterior)[d]	350	450	*upon adoption* 09/14/96
		350	01/01/99

[a] grams of VOC per liter of coating, less water and less exempt compounds
[b] if the coating meets the definition of a Stain or Varnish (Clear Wood Finish); otherwise 250 grams/liter is the default
[c] if the coating meets the definition of an Industrial Maintenance Primer & Topcoat; otherwise 250 grams/liter is the default
[d] special category proposed; currently included within the definition of Fire-Retardant Coatings

Finally, staff has further addressed industry concerns about the non-availability of compliant coatings by modifying the project to include a provision for AQMD staff to conduct a technical assessment one year prior to each of the effective dates for VOC content limits for lacquers in 1998 and flats in 2001 and 2008. The technical assessment will determine where the technology is at that time for that coating category and what, if any, environmental issues are associated with the manufacture and use of such reformulated products. Also to address industry's concerns, PAR 1113 establishes an averaging methodology *for flats* by which compliance with *future* VOC content limits can be demonstrated.

ALTERNATIVES

This *Final* ~~Draft~~ SEA provides a discussion of feasible alternatives to the proposed project which would substantially reduce potential adverse impacts as required by AQMD Rule 110. The alternatives consider other possible means of attaining the objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. A No Project alternative is also evaluated.

Description of Alternatives

The following alternatives were developed based on the proposed amended rule's major components. Each alternative was developed by identifying the major component of PAR 1113 and altering, deleting, or adding one or more of these components.

Alternative A - No Project

This alternative assumes the proposed amendments to Rule 1113 will not be adopted. This would result in the expiration of the current product variances for some of the coating categories. Coating formulators would be expected to comply with all other VOC content limits currently contained in the Table of Standards. *This alternative would maintain the current version of Rule 1113 as amended by the 1990 court order.*

Alternative B - No Emission Limit Changes for Lacquers

Alternative B would not call for a reduction of VOC content for lacquers beyond the current limit of 680 g/l. The other VOC content limit changes in PAR 1113 would be required. This is illustrated in Table 2-2.

TABLE 2-2
Alternative B - Proposed Limits[a]

Coating Category	Current VOC Limit (gram/liter)	Proposed VOC Limit (gram/liter)	Effective Date of VOC Limit
Lacquers[b]	680	680	present
Flats (Interior/Exterior)	250	100	07/01/2001
		50	07/01/2008
Traffic Coatings	250	150	01/01/98
Multi-Color Coatings	420	150	01/01/98
Japans	350[b]	450	*upon adoption* 09/14/96
		350	01/01/99
Magnesite Cement Coatings	450	600	*upon adoption* 09/14/96
		450	01/01/99
~~Tub & Sink Repair~~	420[c]	420	~~09/14/96~~
		~~340~~	~~01/01/99~~
Fire-Proof Coatings (Exterior)[d]	350	450	*upon adoption* 09/14/96
		350	01/01/99

[a] grams of VOC per liter of coating, less water and less exempt compounds
[b] If the coating meets the definition of a Stain or Varnish (Clear Wood Finish); 250 grams/liter is the default
[c] If the coating meets the definition of an Industrial Maintenance Primer & Topcoat; 250 grams/liter is the default
[d] special category proposed; currently included within the definition of Fire-Retardant Coatings

Alternative C - No Emission Limit Changes for Flats

Alternative C would not call for a reduction of VOC content for flats beyond the current limit of 250 g/l. The other VOC content limit changes in PAR 1113 would be required. This alternative is illustrated in Table 2-3.

TABLE 2-3
Alternative C - Proposed Limits[a]

Coating Category	Current VOC Limit (gram/liter)	Proposed VOC Limit (gram/liter)	Effective Date of VOC Limit
Lacquers	680	550	01/01/98
		275	01/01/2005
Flats (Interior/Exterior)	250	250	present
Traffic Coatings	250	150	01/01/98
Multi-Color Coatings	420	150	01/01/98
Japans	350[b]	450	*upon adoption* 09/14/96
		350	01/01/99
Magnesite Cement Coatings	450	600	*upon adoption* 09/14/96
		450	01/01/99
~~Tub & Sink Repair~~	420[c]	420	~~09/14/96~~
		340	~~01/01/99~~
Fire-Proof Coatings (Exterior)[d]	350	450	*upon adoption* 09/14/96
		350	01/01/99

[a] grams of VOC per liter of coating, less water and less exempt compounds
[b] If the coating meets the definition of a Stain or Varnish (Clear Wood Finish); 250 grams/liter is the default
[c] If the coating meets the definition of an Industrial Maintenance Primer & Topcoat; 250 grams/liter is the default
[d] special category proposed; currently included within the definition of Fire-Retardant Coatings

Alternative D - No Interim Limits for Lacquers or Flats

Alternative D would omit the interim 550 g/l VOC content limit for lacquers in 1998 and would require these coatings to meet a 275 g/l VOC content limit in 2005. Also, this alternative would omit the interim 100 g/l VOC content limit for flats in 2001 and would require these coatings to meet a 50 g/l VOC content limit in 2008. The other proposed VOC content limit changes in PAR 1113 would be maintained. This alternative is shown in Table 2-4.

TABLE 2-4
Alternative D - Proposed Limits[a]

Coating Category	Current VOC Limit (gram/liter)	Proposed VOC Limit (gram/liter)	Effective Date of VOC Limit
Lacquers	680	680	present
		275	01/01/2005
Flats (Interior/Exterior)	250	250	present
		50	07/01/2008
Traffic Coatings	250	150	01/01/98
Multi-Color Coatings	420	150	01/01/98
Japans	350[b]	450	*upon adoption* 09/14/96
		350	01/01/99
Magnesite Cement Coatings	450	600	*upon adoption* 09/14/96
		450	01/01/99
~~Tub-&-Sink-Repair~~	420[c]	420	~~09/14/96~~
		~~340~~	~~01/01/99~~
Fire-Proof Coatings (Exterior)[d]	350	450	*upon adoption* 09/14/96
		350	01/01/99

[a] grams of VOC per liter of coating, less water and less exempt compounds
[b] if the coating meets the definition of a Stain or Varnish (Clear Wood Finish); 250 grams/liter is the default
[c] if the coating meets the definition of an Industrial Maintenance Primer & Topcoat; 250 grams/liter is the default
[d] special category proposed; currently included within the definition of Fire-Retardant Coatings

Alternative E - No Emission Limit Changes for Lacquers and Flats

Alternative E would not call for a reduction of VOC content for lacquers beyond the current limit of 680 g/l. Also, this alternative would not call for a reduction of VOC content for flats beyond the current limit of 250 g/l. The other VOC content limit changes in PAR 1113 would be maintained. This alternative is illustrated in Table 2-5.

TABLE 2-5
Alternative E - Proposed Limits[a]

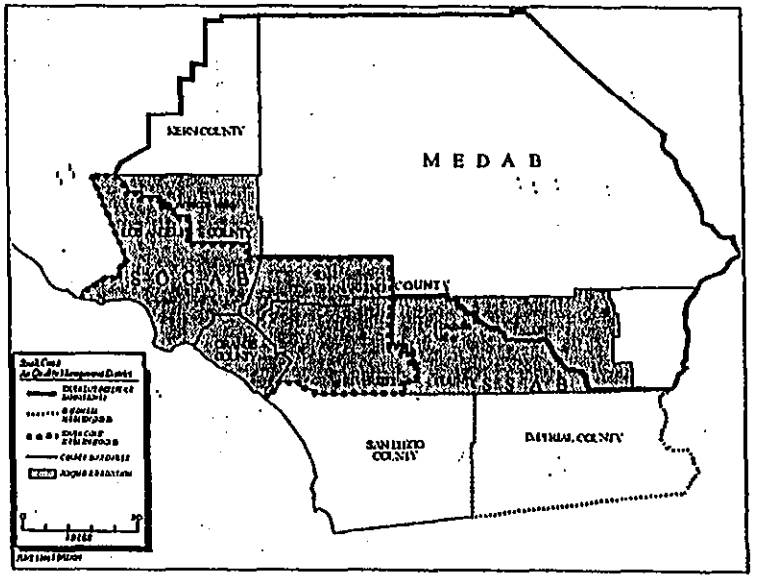
Coating Category	Current VOC Limit (gram/liter)	Proposed VOC Limit (gram/liter)	Effective Date of VOC Limit
Lacquers	680	680	present
Flats (Interior/Exterior)	250	250	present
Traffic Coatings	250	150	01/01/98
Multi-Color Coatings	420	150	01/01/98
Japans	350[b]	450	*upon adoption* 09/14/96
		350	01/01/99
Magnesite Cement Coatings	450	600	*upon adoption* 09/14/96
		450	01/01/99
~~Tub-&-Sink-Repair~~	420[c]	420	~~09/14/96~~
		~~340~~	~~01/01/99~~
Fire-Proof Coatings (Exterior)[d]	350	450	*upon adoption* 09/14/96
		350	01/01/99

[a] grams of VOC per liter of coating, less water and less exempt compounds
[b] if the coating meets the definition of a Stain or Varnish (Clear Wood Finish); 250 grams/liter is the default
[c] if the coating meets the definition of an Industrial Maintenance Primer & Topcoat; 250 grams/liter is the default
[d] special category proposed; currently included within the definition of Fire-Retardant Coatings

EXISTING SETTING

The AQMD has jurisdiction over an area of approximately 12,000 square miles, consisting of the four-county South Coast Air Basin and the Los Angeles County portion of the Mojave Desert Air Basin (MDAB) (formerly the Southeast Desert Air Basin [SEDAB]) and the Riverside County portions of the Salton Sea Air Basin (SSAB) (formerly part of the SEDAB). The Basin, which is a subarea of the AQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. It includes all of Orange county and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Los Angeles County portion of MDAB (known as North county or Antelope Valley) is bounded by the San Gabriel Mountains to the south and west, the Los Angeles/Kern county border to the north, and the Los Angeles/San Bernardino county border to the east. The Riverside county portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella-San Jacinto Planning Area) is a subregion of the Riverside county and SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 2-1).

Figure 2-1
South Coast Air Quality Management District



The following section summarizes the existing settings for other areas of air quality, water resources, human health, hazards, and fire department - public services. For a complete discussion of current and projected future air quality in the AQMD, with and without additional control measures, please refer to the Final 1994 AQMP, including its Appendices and the 1994 AQMP Final EIR. In addition, the Final 1994 AQMP contains information on the existing setting for other environmental areas (e.g., energy, land use, etc.). The above-referenced documents are incorporated by reference and are available from the AQMD's Public Information Center by calling (909) 396-3600.

Air Quality (CO, NO_2, SO_2, Lead, Visibility)

Over the last decade and a half, there has been significant improvement in air quality in the AQMD's jurisdiction. Nevertheless, some air quality standards are still exceeded frequently and by a wide margin. Of the National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, and fine particulate matter [PM10]), the South Coast Air

Basin's jurisdiction is only in attainment with the state and national sulfur dioxide standards.

The following paragraphs briefly summarize the status of air quality in the AQMD's jurisdiction with respect to monitored levels of the criteria pollutants identified in Table 2-6. Table 2-7 includes air quality data for 1995, the most recent year of air quality data available.

Ozone, carbon monoxide (CO), and PM10 continue to be the area's most severe air pollution problems. The following paragraphs briefly summarize air quality in terms of the criteria pollutants identified in Tables 2-6 and 2-7. Table 2-6 lists the ambient air quality standards while Table 2-7 presents 1995 air quality data for the AQMD's jurisdiction.

Unlike primary criteria pollutants that are emitted directly from an emission source, ozone is a secondary pollutant. It is formed in the atmosphere through a photochemical reaction of VOC, oxides of nitrogen (NOx), oxygen, and other hydrocarbon materials with sunlight. Ozone is a deep lung irritant, causing the air passages to become inflamed and swollen. Exposure to ozone produces alterations in respiration, the most characteristic of which is shallow, rapid breathing and a decrease in pulmonary performance. Ozone reduces the respiratory system's ability to fight infection and to remove foreign particles. People who suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis are more sensitive to ozone's effects. In severe cases, ozone is capable of causing death from pulmonary edema. Early studies suggested that long-term exposure to ozone results in adverse effects on morphology and lung-function and acceleration of lung-tumor formation and aging. Ozone exposure also increases the sensitivity of the lung to bronchoconstrictive agents such as histamine, acetylcholine, and allergens.

Locations within the AQMD's jurisdiction exceed the federal ozone standard far more frequently than any other areas in the United States. Ozone levels in the AQMD's jurisdiction exceeded the federal standard by the widest margin compared to other criteria pollutants, with a maximum concentration that was 217 percent of the standard. Ozone concentrations exceeded the state standard at all but one monitored locations.

CO is a colorless, odorless gas formed by the incomplete combustion of fuels. CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with such conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking increases the background level of CO in the blood.

The CO standard was monitored at 22 locations in 1995. The federal and state 8-hour CO standards were exceeded at three locations. Source/Receptor Area No. 12, South Central Los Angeles County, reported by far the greatest number of the exceedances of the federal and state CO standards (13 and 15 days, respectively).

Nitrogen dioxide (NO_2) is a brownish gas that is formed in the atmosphere through a rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. NO and NO_2 are collectively referred to as NO_x. NO_2 can cause health effects in sensitive population groups such as children and people with chronic lung diseases. It can cause respiratory irritation and constriction of the airways, making breathing more difficult. Asthmatics are especially sensitive to these effects. People with asthma and chronic bronchitis may also experience headaches, wheezing and chest tightness at high ambient levels of NO_2. NO_2 is suspected to reduce resistance to infection, especially in young children.

Concentrations of NO_2 have declined substantially over the period 1976 to 1995. By 1991, exceedances of the federal standard were limited to one location in Los Angeles County which is the only area in the United States classified as nonattainment for the federal NO_2 standard. For the first time in 1992, and again in 1993, 1994, and 1995, no location within the AQMD exceeded the federal standard. 1994 was the first year that the state NO_2 standard was not exceeded. The state standard was also met in 1995. Despite declining NOx emissions over the last decade, further NO_x emissions reductions are necessary because NO_x is a PM10 and ozone precursor.

PM10 is defined as suspended particulate matter 10 microns or less in diameter and includes a complex mixture of man-made and natural substances including sulfates, nitrates, metals, elemental carbon, sea salt, soil, organics and other materials. PM10 may have adverse health impacts because these microscopic particles are able to penetrate deeply into the respiratory system. In some cases, the particulates themselves may cause actual damage to the alveoli of the lungs or they may contain adsorbed substances that are injurious. Children can experience a decline in lung function and an increase in respiratory symptoms from PM10 exposure. People with influenza, chronic respiratory disease and cardiovascular disease can be at risk of aggravated illness from exposure to fine particles. Increases in death rates have been statistically linked to corresponding increases in PM10 levels.

In 1995, the federal PM10 standards were exceeded at nine monitoring stations within the AQMD's jurisdiction, while the more stringent state PM10 standards were exceeded at all 19 monitoring stations which monitor PM10.

Sulfur dioxide (SO_2) is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. SO_2 concentrations have been reduced to levels well below state and federal standards. Because SO2 is a precursor to sulfate and PM10 formation,

further reductions in emissions of SO_x are needed to attain compliance with standards for these other pollutants.

Sulfates are a group of chemical compounds containing the sulfate group, which is a sulfur atom with four oxygen atoms attached. Though not exceeded in 1993, the state sulfate standard was exceeded at three locations in 1994 and one location in 1995. There are no federal standards for sulfate.

Lead concentrations once exceeded the state and federal standards by a wide margin, but have not exceeded state or federal standards at any regular monitoring station since 1982. Though special monitoring sites immediately downwind of lead sources recorded very localized violations of the state standard in 1994, no violations were recorded at these stations in 1995.

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility (also called visual range). Until 1989, the standard was based on visibility estimates made by human observers. The standard was subsequently changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles.

Visual range measurements were recorded at two locations in 1995. There were 109 days in 1995 which exceeded the state standard at the east San Gabriel Valley monitoring station (out of 312 days of data). The central San Bernardino Valley station recorded 50 days exceeding the state standard in 1995 (out of 116 days of data).

It should be noted that there are no state or federal ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because in the presence of sunlight they undergo photochemical reactions *in the presence of NO_x* with NO_2 molecules to form photochemical oxidants, most notably ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

Reducing VOC emissions is one part of the AQMD's long-range strategy to attain the state and federal ambient air quality standards. Rule 1113 is part of this long-range strategy.

TABLE 2-6

Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. >	0.12 ppm, 1-hr avg.>	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals. (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possibly increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. > 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	30 $\mu g/m^3$, ann. geometric mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10am - 6pm)		Visibility impairment on days when relative humidity is less than 70 percent

TABLE 2-7

1995 Air Quality Data in the South Coast Air Quality Management District

Source/ Receptor Area No.	Location of Air Monitoring Station	Carbon Monoxide: No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	2nd High Conc. ppm 8-hour	No. Days Standard Exceeded: Federal >9.5 ppm 8-hr.	State[a] >9.1 ppm 8-hr.	State[a] >20 ppm 1-hr
LOS ANGELES COUNTY								
1	Central LA	358	10	8.4	8.0	0	0	0
2	NW Coast LA Co	344*	8*	5.6*	5.6*	0*	0*	0*
3	SW Coast LA Co	360	11	8.7	8.7	0	0	0
4	S Coast LA Co	364	9	6.3	6.3	0	0	0
6	W San Fernan V	346	13	10.3	9.5	2	3	0
7	E San Fernan V	362	13	12.0	11.0	4	6	0
8	W San Gabrl V	365	11	9.1	8.5	0	1	0
9	E San Gabrl V	363	8	6.3	6.3	0	0	0
10	Pomona/Wln V	364	8	6.1	5.9	0	0	
11	S San Gabrl V	365	10	7.9	7.6	0	0	
12	S Cent LA Co	363	17	11.6	11.6	13	0	
13	Sta Clarita V	359	7	3.9	3.9	0	0	
14	Antelope V	365	7	4.6	4.6	0	0	
ORANGE COUNTY								
16	N Orange Co	365	13	6.6	6.5	0	00	
17	Cent Orange Co	360	10	8.0	7.4	0	00	
18	N Coast Orange	363	8	6.6	5.3	0	00	
19	Saddleback V	363	6	4.0	4.0	0	00	
RIVERSIDE COUNTY								
22	Norco/Corona	--	--	--	--	--	--	-
23	Metro Riv Co	365	9	6.5	5.8	0	00	
24	Perris Valley	--	--	--	--	--	--	-
25	Lake Elsinore	--	--	--	--	--	--	-
26	Temecula V	--	--	--	--	--	--	-
28	Hemet/Sn Jcnto	--	--	--	--	--	--	-
29	San Gorgonio P	--	--	--	--	--	--	-
30	Coachella V	360	3	1.5	1.5	0	00	
SAN BERNARDINO COUNTY								
32	NW SB V	--	--	--	--	--	--	-
33	SW SB V	--	--	--	--	--	--	-
34	Cent SB V	363	9	6.3	5.9	0	0	0
35	E SB V	--	--	--	--	--	--	-
37	Cent SB Mtns	--	--	--	--	--	--	-

ABBREVIATIONS USED IN THE AREA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

ppm - Parts per million parts of air, by volume.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
a) - The federal 1-hour standard (1-hour average CO > 35 ppm) was not exceeded.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	Ozone: No. Days of Data	Max. Conc. in ppm 1-hour	2nd High Conc. ppm 1-hour	No. Days Standard Exceeded: Federal >.12 ppm 1-hour	State >.09 ppm 1-hour
LOS ANGELES COUNTY						
1	Central LA	365	.17	.15	5	38
2	NW Coast LA Co	344*	.14*	.12*	1*	19*
3	SW Coast LA Co	365	.12	.10	0	3
4	S Coast LA Co	361	.11	.11	0	3
6	W San Fernan V	365	.15	.14	8	47
7	E San Fernan V	365	.17	.16	20	58
8	W San Gabrl V	362	.21	.19	44	88
9	E San Gabrl V	365	.22	.21	75	118
10	Pomona/Wln V	365	.22	.20	47	87
11	S San Gabrl V	365	.18	.17	20	66
12	S Cent LA Co	363	.09	.08	0	0
13	Sta Clarita V	365	.21	.17	26	72
14	Antelope V	360	.14	.14	5	61
ORANGE COUNTY						
16	N Orange Co	365	.16	.13	4	33
17	Cent Orange Co	365	.13	.13	2	19
18	N Coast Orange	356	.11	.11	0	3
19	Saddleback V	365	.15	.12	1	18
RIVERSIDE COUNTY						
22	Norco/Corona	362	.19	.18	23	75
23	Metro Riv Co	365	.21	.20	52	109
24	Perris Valley	365	.20	.18	36	107
25	Lake Elsinore	362	.19	.18	23	72
26	Temecula	365	.11	.10	0	6
28	Hemet/Sn Jcnto	365	.15	.13	2	36
29	San Gorgonio	365	.18	.16	15	48
30	Coachella V	361	.16	.15	9	49
SAN BERNARDINO COUNTY						
32	NW SB V	365	.24	.23	67	110
33	SW SB V	--	--	--	--	--
34	Cent SB V	365	.22	.21	61	111
35	E SB V	364	.24	.21	69	123
37	Cent SB Mtns	365	.26	.22	65	113

ppm - Parts per million parts of air, by volume.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	Nitrogen Dioxide: No. Days of Data	Max. Conc. in ppm 1-hour	Average Compared to Federal Standard: AAM in ppm	Average Compared to Federal Standard: % above std.	No. Days Std. Exc'd State: > .25 ppm 1-hour
LOS ANGELES COUNTY						
1	Central LA	349*	.24*	.0450*	.0*	0*
2	NW Coast LA Co	344*	.20*	.0278*	.0*	0*
3	SW Coast LA Co	365	.18	.0305	.0	0
4	S Coast LA Co	359	.21	.0367	.0	0
6	W Sn Fernan V	360	.14	.0317	.0	0
7	E Sn Fernan V	356	.18	.0453	.0	0
8	W Sn Gabrl V	365	.22	.0376	.0	0
9	E Sn Gabrl V	365	.22	.0464	.0	0
10	Pomona/Win V	362	.21	.0456	.0	0
11	S Sn Gabrl V	359	.23	.0456	.0	0
12	S Cent LA Co	362	.21	.0463	.0	0
13	Sta Clarita V	355	.16	.0305	.0	0
14	Antelope V	360	.14	.0194	.0	0
ORANGE COUNTY						
16	N Orange Co	362	.20	.0391	.0	0
17	Cent Orange Co	358	.18	.0371	.0	0
18	N Coast Orange	365	.18	.0239	.0	0
19	Saddleback V	--	--	--	--	--
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metro Riv Co	362	.15	.0306	.0	0
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	364	.13	.0208	.0	0
26	Temecula V	--	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--	--
29	San Gorgonio P	--	--	--	--	--
30	Coachella V	365	.09	.0223	.0	0
SAN BERNARDINO COUNTY						
32	NW SB V	365	.20	.0464	.0	0
33	SW SB V	--	--	--	--	--
34	Cent SB V	349*	.17*	.0424*	.0*	0*
35	E SB V	--	--	--	--	--
37	Cent SB Mtns	--	--	--	--	--

ppm - Parts per million parts of air, by volume.
AAM - Annual arithmetic mean.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	Sulfur Dioxide: No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. In ppm 24-hour	Average Compared to Federal Standard: AAM in ppm	No. Days Std. Exc'd State: > .25/ > .04 ppm 1/24-hr.
LOS ANGELES COUNTY						
1	Central LA	365	.01	.010	.0010	0/0
2	NW Coast LA Co	--	--	--	--	--
3	SW Coast LA Co	365	.06	.012	.0027	0/0
4	S Coast LA Co	365	.14	.018	.0023	0/0
6	W Sn Fernan V	--	--	--	--	--
7	E Sn Fernan V	365	.01	.005	.0001	0/0
8	W Sn Gabrl V	--	--	--	--	--
9	E Sn Gabrl V	--	--	--	--	--
10	Pomona/Win V	--	--	--	--	--
11	S Sn Gabrl V	--	--	--	--	--
12	S Cent LA Co	362	.03	.013	.0030	0/0
13	Sta Clarita V	--	--	--	--	--
14	Antelope V	--	--	--	--	--
ORANGE COUNTY						
16	N Orange Co	365	.02	.010	.0009	0/0
17	Cent Orange Co	--	--	--	--	--
18	N Coast Orange	365	.02	.009	.0007	0/0
19	Saddleback V	--	--	--	--	--
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metro Riv Co	365	.01	.006	.0001	0/0
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	--	--	--	--	--
26	Temecula V	--	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--	--
29	San Gorgonio P	--	--	--	--	--
30	Coachella V	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	NW SB V	--	--	--	--	--
33	SW SB V	--	--	--	--	--
34	Cent SB V	364	.02	.010	.0006	0/0
35	E SB V	--	--	--	--	--
37	Cent SB Mtns	--	--	--	--	--

ppm - Parts per million parts of air, by volume.
AAM - Annual arithmetic mean.
-- - Pollutant not monitored.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in µg/m³ 24-hour	No. (%) Samples Exceeding Standard: Federal >150 µg/m³ 24-hour	No. (%) Samples Exceeding Standard: State >50 µg/m³ 24-hour	Annual Averages: AAM Conc. µg/m³	Annual Averages: AGM Conc. µg/m³
	Suspended Particulates PM10						
LOS ANGELES COUNTY							
1	Central LA	60	141	0	14(23.3)	42.8	36.4
2	NW Coast LA Co	--	--	--	--	--	--
3	SW Coast LA Co	58	136	0	8(13.8)	36.2	31.2
4	S Coast LA Co	59	146	0	11(18.6)	38.7	32.3
6	W Sn Fernan V	--	--	--	--	--	--
7	E Sn Fernan V	59	135	0	15(25.4)	42.2	37.2
8	W Sn Gabrl V	--	--	--	--	--	--
9	E Sn Gabrl V	60	157	1(1.7)	24(40.0)	49.1	40.8
10	Pomona/Wln V	61	177	3(4.9)	19(31.1)	46.0	36.6
11	S Sn Gabrl V	--	--	--	--	--	--
12	S Cent LA Co	--	--	--	--	--	--
13	Sta Clarita V	61	87	0	13(21.3)	37.0	31.2
14	Antelope V	54*	61*	0*	3(5.6)*	25.6*	22.6*
ORANGE COUNTY							
16	N Orange Co	--	--	--	--	--	--
17	Cent Orange Co	60	172	1(1.7)	14(23.3)	43.5	35.9
18	N Coast Orange	--	--	--	--	--	--
19	Saddleback V	60	122	0	11(18.3)	37.6	32.0
RIVERSIDE COUNTY							
22	Norco/Corona	60	177	2(3.3)	28(46.7)	54.2	44.6
23	Metro Riv Co	61	219	4(6.6)	38(62.3)	69.0	51.8
24	Perris Valley	60	145	0	23(38.3)	46.7	36.9
25	Lake Elsinore	--	--	--	--	--	--
26	Temecula V	--	--	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--	--	--
29	San Gorgonio P	61	138	0	7(11.5)	30.1	24.5
30	Coachella V	61	199	1(1.6)	27(44.3)	52.0	37.2
SAN BERNARDINO COUNTY							
32	NW SB V	--	--	--	--	--	--
33	SW SB V	61	167	3(4.9)	31(50.8)	54.0	44.2
34	Cent SB V	61	178	2(3.3)	35(57.4)	61.0	50.6
35	E SB V	59	172	1(1.7)	24(40.7)	48.4	37.4
37	Cent SB Mtns	59	53	0	1(1.7)	20.4	17.6

µg/m³ - Micrograms per cubic meter of air.
AAM - Annual arithmetic mean. AGM - Annual geometric mean.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in µg/m³ 24-hour	Annual Averages: AAM Conc. µg/m³	Annual Averages: AGM Conc. µg/m³
	Particulates TSP				
LOS ANGELES COUNTY					
1	Central LA	61	195	79.5	71.1
2	NW Coast LA Co	54*	148*	55.8*	50.0*
3	SW Coast LA Co	61	156	65.9	60.3
4	S Coast LA Co	61	189	66.9	59.0
6	W Sn Fernan V	--	--	--	--
7	E Sn Fernan V	55*	177*	77.5*	67.7*
8	W Sn Gabrl V	61	143	58.6	50.9
9	E Sn Gabrl V	61	239	99.2	84.2
10	Pomona/Wln V	--	--	--	--
11	S Sn Gabrl V	59	225	88.4	79.0
12	S Cent LA Co	60	217	87.0	80.3
13	Sta Clarita V	--	--	--	--
14	Antelope V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	--	--	--	--
17	Cent Orange Co	59	196	69.3	61.5
18	N Coast Orange	--	--	--	--
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co	61	354	109.6	87.9
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
26	Temecula V	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Coachella V	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	59	176	74.4	62.0
33	SW SB V	--	--	--	--
34	Cent SB V	60	257	116.5	99.2
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

µg/m³ - Micrograms per cubic meter of air.
AAM - Annual arithmetic mean. AGM - Annual geometric mean.
-- - Pollutant not monitored.

TABLE 2-7

(Continued)

Source/ Receptor Area No.	Location of Air Monitoring Station	Lead: Max. Mo. Conc. $\mu g/m^3$	Lead: Max. Qtrly. Conc. $\mu g/m^3$	Lead: Quarters/Months Exceeding Standard — Federal >1.5 $\mu g/m^3$ Qtrly. Avg.	Lead: Quarters/Months Exceeding Standard — State >=1.5 $\mu g/m^3$ Mo. Avg.
LOS ANGELES COUNTY					
1	Central LA	.07	.06	0	0
2	NW Coast LA Co	--	--	--	--
3	SW Coast LA Co	.04	.04	0	0
4	S Coast LA Co	.05	.04	0	0
6	W SN Fernan V	--	--	--	--
7	E Sn Fernan V	.05*	.04*	0*	0*
8	W Sn Gabrl V	--	--	--	--
9	E Sn Gabrl V	--	--	--	--
10	Pomona/Wln V	--	--	--	--
11	S Sn Gabrl V	.07	.06	0	0
12	S Cent LA Co	.07	.06	0	0
13	Sta Clarita V	--	--	--	--
14	Antelope V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	--	--	--	--
17	Cent Orange Co	.04	.04	0	0
18	N Coast Orange	--	--	--	--
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co	.05	.04	0	0
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
26	Temecula V	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Coachella V	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	.06	.04	0	0
33	SW SB V	--	--	--	--
34	Cent SB V	.05	.04	0	0
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

$\mu g/m^3$ - Micrograms per cubic meter of air.
-- - Pollutant not monitored.

TABLE 2-7

(Concluded)

Source/ Receptor Area No.	Location of Air Monitoring Station	Sulfate: Max. Conc. in $\mu g/m^3$ 24-hour	Sulfate: No. (%) Samples Exceeding Standard — State >=25 $\mu g/m^3$ 24-hour	Visual Range: No. Days of Data	Visual Range: No. Days Exceeding State Standard
LOS ANGELES COUNTY					
1	Central LA	15.5	0	--	--
2	NW Coast LA Co	13.3*	0*	--	--
3	SW Coast LA Co	20.4	0	--	--
4	S Coast LA Co	16.9	0	--	--
6	W Sn Fernan V	--	--	--	--
7	E Sn Fernan V	13.7*	0*	--	--
8	W Sn Gabrl V	13.2	0	--	--
9	E Sn Gabrl V	12.9	0	312*	109*
10	Pomona/Wln V	--	--	--	--
11	S Sn Gabrl V	16.3	0	--	--
12	S Cent LA Co	18.8	0	--	--
13	Sta Clarita V	--	--	--	--
14	Antelope V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	--	--	--	--
17	Cent Orange Co	12.8	0	--	--
18	N Coast Orange	--	--	--	--
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co	26.3	0	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
26	Temecula V	--	--	--	--
28	Hemet/Sn Jcnto	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Cochella V	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	12.5	0	--	--
33	SW SB V	--	--	--	--
34	Cent SB V	13.4	0	116*	51*
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

$\mu g/m^3$ - Micrograms per cubic meter of air.
-- - Pollutant not monitored.

Water Resources

The regulatory program to control water quality in the state includes the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB). These agencies have broad powers to protect ground and surface water supplies and to regulate waste [illegible] and hazardous waste cleanups. These agencies also regulate discharges to state waters through federal National Pollution Discharge Elimination System permits. Discharges to publicly-owned treatment works (POTWs) are regulated through federal pre-treatment requirements enforced by the POTWs.

Water quality problems exist to various degrees in the region's surface and groundwater supplies. These problems include high nitrate, bacteria, and total dissolved solids in some surface waters, and high salinity and VOC levels in some groundwaters.

Water sources for the district include local ground and surface waters, which supply about one-third of regional water demand, and supplemental sources, including the State Water Project and [illegible]ngeles Aqueduct, which supply the remaining two-thirds. Suppliers of supplem[illegible] include the Metropolitan Water District of Southern California and the Los Angeles Department of Water and Power. In 1990, total water use in the district was 3.9 million acre-feet (MAF), or 1.3 trillion gallons. The major water resource alternative is reclaimed wastewater. The supply of reclaimed wastewater in 2010 is expected to equal about 20 percent of current water use.

Human Health

This section describes the existing setting for human health as it is affected by air quality. The actual effects of exposure to air contaminants, however, depend on such factors as the ambient concentrations of the pollutants of concern, exposure duration, potency of the pollutants, exposure frequency, and other factors.

Acute symptoms most often reported in conjunction with air pollution include irritation of the eyes and throat, headache, fatigue, tightness in the chest or chest pain, wheezing and coughing. The occurrence of a particular symptom or group of symptoms will depend on the mix of pollutants, the level of exposure and individual sensitivity of the exposed individual. Health effects of individual criteria air pollutants as summarized below.

CO competes with oxygen in the blood and reduces its ability to transport oxygen to vital organs in the body. CO ambient air quality standards are designed to protect persons whose medical conditions already compromise their circulatory system's ability to deliver oxygen.

Ozone is a strong oxidizer which damages cells in the lung's airways, making the passage inflamed and swollen. This causes respiratory irritation and discomfort and makes breathing more difficult during exercise.

NO_2 can cause health effects in sensitive population groups such as children and people with chronic lung diseases. It can cause respiratory irritation and constriction of the airways, making breathing more difficult.

PM10 consists of particles small enough to be deposited in the lungs which can block or damage the air sacs in the lungs. Nitrates, sulfates, and dust particles are major components of PM10. PM10 can cause both short- and long-term reduction in lung function.

Lead is a toxic heavy metal that is persistent in the environment and can accumulate in living tissue. It has no known beneficial function in the human body. The primary health concern with lead pollution is the potential for neurologic effects in children that may affect learning and intelligence.

Hazardous air pollutants are another human health concern in the district. Air toxics studies undertaken by the AQMD indicate that emissions of toxic air contaminants result in both individual and regional risk levels that are considered unacceptable. Exposure is linked to increased cases of cancer as well as health effects other than cancer.

Hazards

Hazard concerns are related to the risks of fire, explosions, or releases of hazardous substances in the event of accident or upset conditions. Hazard is thus related to the production, use, storage, and transportation of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used on a consumable basis include fuels, paints, paint thinner, nail polish, and solvents. Hazardous materials may be stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air and pipeline.

Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions. The California Hazardous Materials Incident Reporting System (CHMIRS) is a post-incident reporting system to collect state-wide data on incidences involving the accidental release of hazardous

materials. The following information is a summary of the incidents reported in 1990 and 1991, the most recent years for which data are available.[2]

- The location, or property use, where incidents occurred is quite consistent for the four years 1988 - 1991 with 47 - 50 percent of the incidents at fixed facilities and 33-37 percent of the incidents on ground transportation routes. Residential property was the largest single reported category and county/city roads were the most involved transportation route.

- Freight and passenger vehicles were involved in 567 incidents in 1990 and 655 in 1991. Collision/overturn was the cause of 236 incidents in 1990, with passenger vehicles involved in 58, and freight vehicles, 179. Of the 206 collision/overturn incidents reported in 1991, passenger vehicles were involved in 64 and freight vehicles in 141.

- Threatened releases often pose a serious concern and frequently require the same expenditure of resources as actual releases. Twenty-eight percent of the reported incidents were threatened releases in 1990 and 72 percent were actual releases. In 1991, of the total number of reported incidents, 25 percent were threatened and 75 percent were actual releases.

- Incidents occurred on privately managed property 41 percent and 49 percent of the time in 1990 and 1991, respectively. Incidents occurred on publicly managed property 43 percent of the time in both years.

- Emergency response personnel may perform many tasks to properly handle a hazardous materials incident. They may identify the material involved, evacuate or decontaminate the area, or shut down the system, etc. Emergency response personnel performed an average of four activities per incident in 1990 and 1991.

- Two fatalities resulting from hazardous materials incidents were reported in 1990; one suicide and one accidental. An emergency responder fatality was reported in 1991 along with three other fatalities; one suicide and two accidental.

- Acetone is a Class 3 Flammable Liquid by National Fire Protection Association (NFPA). The total amount of acetone used in the district in 1993 was 2,700 tons. Incidents involving acetone were reported 15 times in 1990 and 8 times in 1991. The following tables indicate that acetone was involved in significantly fewer incidences than paint and paint thinner.

[2] Hazardous Materials Incidents California: January 1990 - December 1991. California Office of Emergency Services. April 1994

Extensive additional information regarding impacts associated with the use of acetone are included in the Human Health, Hazard, and Fire Department impact sections.

Los Angeles, Riverside, San Bernardino, and Orange counties together account for 37 percent of the total incidents reported in the state. Table 2-8 breaks down the 1991 data for these four counties by reported incidents and rank within the state.

TABLE 2-8

Reported Hazardous Materials Incidents - 1991

County	Reported Incidents	% of Reported Incidents	Statewide Rank by Frequency
Los Angeles	366	11	2
Orange	378	12	1
Riverside	251	8	3
San Bernardino	186	6	6
Total	1181	37	

Source: Office of Emergency Services, Hazardous Material Unit, April 1994

TABLE 2-9

Roadway Incidents (*latest reported years 1990 & 1991*)

Chemical	1990	1991
Acetone	1	3
Paint	13	15
Paint Thinner	1	2
Lacquer	2	0

TABLE 2-10

Chemical Incidents (*latest reported years 1990 & 1991*)

Chemical	1990	1991
Paint	80	84
Paint Thinner	16	23
Acetone	15	8
Lacquer	3	8
Methyl Ethyl Ketone (MEK)	9	6

Public Services - Fire Departments

Local fire departments are responsible for responding not only to fires but are responsible for initial containment in situations involving accidental release of hazardous materials. Fire response services are generally provided by city and county fire departments with some cities contracting with the county for services. The U.S. Forest Service provides fire protection for all national forest lands. Fire response services for the northeastern area of Los Angeles County is provided by the Los Angeles County Department of Forestry. Approximately 17,914 personnel (one employee per 765 civilians) are employed in fire protection within the four county region comprising the district

CHAPTER 3

ENVIRONMENTAL IMPACTS, MITIGATION, AND ALTERNATIVES

POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

An environmental checklist, which was prepared as part of the Notice of Preparation/Initial Study for the proposed project dated May 6, 1996, was used to identify potential adverse impacts from the proposed amendments for further analysis. A copy of this document along with the Notice of Preparation can be found in Appendix *D A*.

The proposed rule amendments will lower the allowable VOC content of lacquers, flats (interior and exterior), traffic coatings, and multi-color coatings. The following analyses will evaluate potential environmental impacts associated with implementing the proposed rule changes including an analysis of a potential increase in the use of acetone as a replacement solvent in coatings due to its recent listing as an "exempt" compound. Each section provides background information, analyzes potential impacts from the proposed amendments recommends feasible mitigation measures if available, and summarizes remaining impacts after mitigation.

AIR QUALITY IMPACTS- CRITERIA POLLUTANTS

Significance Criteria

The project will be considered to have a significant impact on air quality if any emissions associated with the proposed project are greater than the daily emission significance thresholds established by the AQMD in the CEQA Air Quality Handbook (AQMD November 1993). The significance threshold for VOC emissions, for example, is 55 pounds per day.

Background

According to the 1994 AQMP inventory, emissions from architectural coating usage represented approximately 67.2 tons per day in 1990 and if left uncontrolled would increase to 83 tons per day by 2010. Architectural coatings represent the largest stationary source category of VOC emissions in the district. While there are many types of architectural coatings currently in use, these proposed amendments would reduce the allowable VOC content of four coating categories: lacquers, flats (interior and exterior),

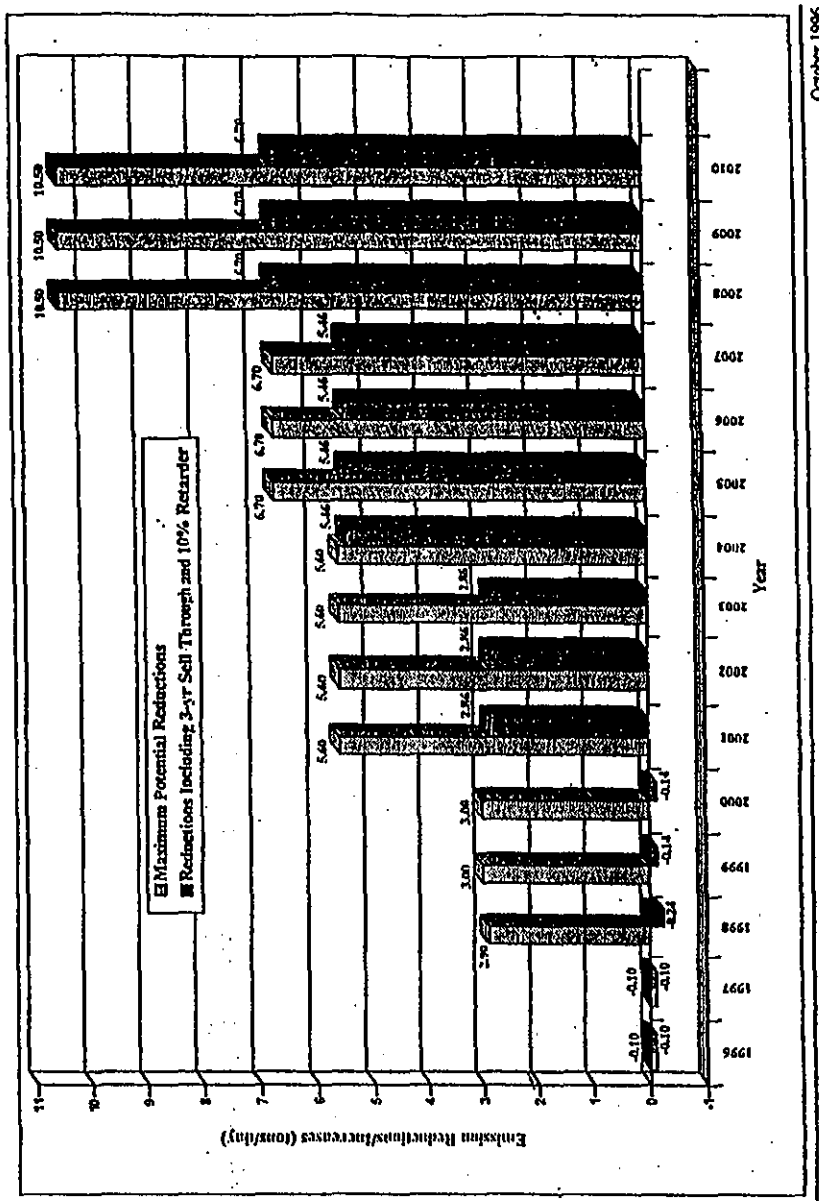
traffic coatings, and multi-color coatings. The most likely methods of complying with the proposed VOC content requirements is by either replacing the non-compliant coatings with existing compliant coatings or by formulating new compliant coatings. Compliant products are available for some applications and are currently being used. Other compliant products are being developed and researched partly as a result of other technology forcing rules previously adopted by the AQMD.

Direct Air Quality Impacts

IMPACT: Some portions of PAR 1113 will result in emission increases due to a temporary relaxation of several coating limit standards. For example, increasing the VOC limit for fire-proofing coatings, magnesite coatings, *and* Japan coatings~~, and tub and sink repair coatings~~ will result in an overall VOC emissions increase of 200 pounds per day. This relaxation will result in a short term significant air quality impact because an increase in VOC emission of 200 pounds per day will occur for a year and a half until the proposed lower VOC content limits go into effect on January 1, 1998. Lowering the VOC limits for lacquers, flats, traffic coatings, and multi-color coatings is expected to result in a net reduction of VOCs in the long term. In addition, the proposed reduction of VOC limits will expire on January 1, 1999. The emission reductions and increases anticipated from PAR 1113 are shown in Figure 3-1.

For the worst case emission reduction scenario shown in Figure 3-1, it is assumed that during the sell through period for each coating category, the emission reductions are offset by the emission increases associated with selling of non-compliant coatings. Also for this scenario, it is assumed that 10 percent retarder will be used 365 days per year. It should be noted for this scenario, that after the year 2010 emission reductions will increase to *10.5* ~~10.6~~ tons/day because the sell through period would end for the flat coatings final compliance limit.

Figure 3-1
Overall Emission Reductions/Increases from PAR 1113



Several concerns regarding the potential adverse indirect air quality impacts associated with PAR 1113 were raised by the regulated industry at various working group meetings, public workshops, and by correspondence. To more fully address those concerns the potential indirect impacts of lacquers, flats, traffic coatings, and multi-color coatings will be analyzed separately in the following subsections.

Indirect Air Quality Impacts

Due to the size of the structures being coated and the outdoor work locations, add-on air pollution control equipment have not been used for compliance in the past and are not expected to be used to comply with the proposed amendments. No cross-media environmental impacts associated with the use of such equipment are expected.

Lacquers

The following discussion addresses the potential adverse air quality impacts associated with lowering the VOC content limits for lacquers. Flats, traffic coatings, and multi-color coatings are discussed separately.

AQMD Staff has also recently amended Rule 1136 - Wood Products Coating which has many similar requirements to those found in Rule 1113 as both rules regulate the allowable VOC content for various coatings (including lacquers) which are commonly applied to wood substrates. Rule 1136 typically regulates the application of coatings such as lacquers onto kitchen and bath cabinets as well as architectural products including doors, jambs, paneling etc. The application and curing methods are also similar among the two rules. Rule 1136 facilities typically air dry their products due to the Southern Californian warm and dry climate. Curing ovens are not generally used to cure lacquer applications regulated by Rule 1136. Wood product production lines, under Rule 1136, are air dried then stacked before assembly and shipment. Some manufacturers do not allow the necessary time to fully cure the product and have had problems which require touch-ups and/or repairs.

Architectural coatings regulated by Rule 1113 are also typically dried in an open air environment, such as at new construction or housing developments. This is advantageous because cabinets and other woodwork is coated after installation; thereby eliminating the drying, packing, and transporting issues associated with Rule 1136 applications. Therefore, the wood product should have sufficient time to fully cure in place with minimal dust adhesion or other performance characteristic problems.

Both the exterior and interior wood products coated under either rule have similar durability expectations. Outdoor wood products, such as housing panels (Rule 1113) and picnic tables (Rule 1136), will have more weather exposure than interior walls and dining room chairs. Industry representatives, however, contend that similar quality issues may exist for products finished with 1113 lacquers as have been encountered by some wood furniture manufacturing facilities.

Industry provided oral testimony at the Rule 1113 Public Workshop on May 24, 1996 as well as written comments received on the Notice of Preparation/Initial Study prepared for this Final Draft SEA. Seven issues were identified that could result in increased indirect VOC emissions due to a requirement to lower the VOC content of lacquers. The seven alleged impacts (raised in the industry's prior litigation) are: increased coating thickness, more thinning, more topcoats, more touch-ups, more priming, more frequent recoating, and more reactivity. The first six alleged impacts all essentially assert that the new formulations, either solvent-based or water-based, result in more coating use resulting in an overall increase in VOC emissions for a specific area covered or over time. The seventh alleged impact involves the assertion that more reactive solvents will be used in the compliant reformulations than the solvents used in the solvent-based coatings.

As previously mentioned in the Executive Summary, the appellate court has already determined that six of the seven impacts had been adequately addressed in the previously prepared CEQA document (a Determination of No Significant Impacts - DONSI) certified in February 1990. However, the lower court set aside the VOC limits for lacquers of 550 g/l because the court felt that the issue of illegal thinning had not been adequately addressed in that document. The AQMD did not appeal that finding.

As mandated by the court judgment the thinning issue associated with the proposed rule amendments related to lacquers is evaluated below. Staff has also reanalyzed the other six potential impacts. As shown below, staff continues to believe those six other alleged impacts are not potentially significant.

Illegal Thinning

As directed by the court, the AQMD has extensively analyzed the alleged impact due to more thinning. Industry argues that low VOC compliant lacquers are more viscous and may be thinned with lacquer thinner to facilitate their application, thereby creating a potential indirect adverse air quality impact. The AQMD has concluded that such potential impacts should not occur. Many of the coatings to be reformulated are water-based formulations or based on acetone as a substitute solvent, thereby eliminating any concerns of thinning the coating as supplied and increasing the VOC content as applied beyond the compliance limit. Since acetone is no longer considered a reactive VOC, thinning with acetone would, therefore, not increase VOC emissions. Water based coatings are thinned with water and would also not result in increased VOC emissions.

It has been further asserted that users will resort to higher solids substitutes in lieu of compliant acetone-based lacquers or water-based topcoats to provide a thicker film. Hence, as industry asserts, a thicker film means less coverage. Therefore, thinning will occur to get the same coverage area resulting in more VOC emissions. As shown in Table 3-1G, based upon manufacturer's claims regarding coverage, the substitutes have the same or better coverage area as conventional lacquers proving that solids content is the true indication of expected coverage levels. Hence, it is not expected that these substitutes, if used, would be thinned so as to result in greater VOC emissions.

Illegal Thinning as a General Practice

In oral testimony received by the AQMD from a few industry representatives, it has been asserted that thinning occurs in the field in excess of what is allowed by the AQMD rule limits. Extensive research has been conducted during the last six years to determine whether or not thinning of materials beyond the allowable levels occurs in the field. AQMD staff, as part of this rule making effort, conducted over 60 unannounced site visits to industrial parks and new residential construction sites to survey contractors regarding their thinning practices, coating application techniques, and clean-up practices. Also during these site visits, samples were collected for coatings as applied and as supplied, for laboratory analysis and subsequent study of thinning practices. The results of the study indicate that out of the *91* 60 samples taken only *nine* seven of them were thinned with solvents. Out of the *nine* seven thinned samples, only *two* one was thinned to the extent that the VOC content limit of the coating, as applied, would have exceeded the applicable rule limit[3].

During pre-arranged visits, however, excessive thinning was observed at only one site at a 1:2 ratio. At this level, the coating was thinned to the point where, according to the professional contractor using it, it did not provide adequate hiding and he had to apply several coats. The practice of over-thinning is expected to inhibit hiding power and drying time of a coating.

A number of additional studies have addressed the thinning issue. The results are detailed below:

- In mid-1991, the California Air Resources Board (CARB) conducted a field study of thinning in regions of California that have established VOC limits for architectural coatings (CARB, 1991). A total of 85 sites where painting was in progress were investigated. A total of 121 coatings were in use at these sites, of which 52 were specialty coatings. The overall result of this study was that only six percent of the coatings were thinned in excess of the required VOC limit indicating a 94% rate of compliance.

- The AQMD contracted with an environmental consulting firm, to study thinning practices in the South Coast District (AQMD 1993). In Phase I of the study, consumers who had just purchased paints were interviewed as they left one of a number of stores located in different areas of the district. Seventy solvent-based paint users responded to the survey. One-third of consumers purchased solvent-based coatings. Of those surveyed, three (four percent of all solvent-based paint purchasers) indicated that they planned to thin their coatings before use. In Phase II of the study, the consultant contacted 36 paint contractors. The majority stated that they were using water-based coatings. Four contractors using solvent-based paints allowed the consultant to collect paint samples at their painting sites. None of the samples collected were thinned.

The AQMD has solicited empirical data from the paint industry on a number of occasions to support their claims of increased thinning. In contrast to the empirical data acquired from the field studies detailed above, the AQMD has received no countervailing empirical data from other sources to indicate that thinning is occurring to a greater extent than the above data would indicate.

In summary, field investigations of actual painting sites in the South Coast District and other areas of California that have VOC limits for coatings indicate that thinning of specialty coatings exists but rarely beyond the actual compliance limits. Even in cases where thinning does occur, it is rarer still for paints to be thinned to levels would exceed applicable VOC content limits. The conclusion is that widespread thinning does not occur often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared with emissions from higher VOC coatings. Professional contractors can receive Notices of Violation (NOVs) for the practice of over thinning as it is illegal under the current version of the rule to exceed the specified compliance limits. It is, therefore, not likely that the proposed rule amendments would increase this practice.

As already noted, during the numerous surprise site visits conducted by district staff, inspectors did not observe excess thinning to the degree cited by the industry representatives.

Increased Coating Thickness

Industry representatives contend that the new compliant coatings or substitutes are high in solids content and are more viscous and difficult to handle during application, tending to produce a thick film when applied directly from the can. Further a thicker film would result in a smaller surface area being covered with a given amount of material thus

[3] *After the Draft SEA was circulated for public comment, AQMD staff visited additional sites. To alleviate any confusion, and for comparison purposes, the numbers reported in the Draft SEA are as follows: 37 sites visited, 60 samples taken (31 water-based and 29 solvent-based), 7 solvent-based sets thinned, one was thinned beyond the compliance limit.*

increasing VOC emissions rather than reducing them. As a result, more high solids coatings would be required. However, this is contradictory to the logic that a coating with more solids will actually cover a greater surface area.

Industry has indicated that lowering the limit from 680 g/l to 550 g/l would effectively 'ban' traditional lacquers and cause the use of less desirable compliant products or substitutes. These substitutes are:

- Acetone-based lacquer reformulations
- Varnishes
- Two component, high performance coatings (i.e., catalyzed polyurethanes)
- Pigmented coating systems
- Water-based clear topcoats

Industry representatives assert that the use of acetone-based lacquers or water-based topcoats or substitutes would result in more VOC emissions per unit area covered than compared to current traditional lacquers.

AQMD staff evaluated a random sample of high and low-VOC content of alleged coatings substitutes and some lacquers to compare solids content and coverage area. Tables 3-1A through 3-1F show the solids content, coverage area, and dry time between coats. Data in these Tables were obtained from manufacturers' Material Safety Data Sheets (MSDS), technical data sheets, and coating can labels. As can be seen from Table 3-1G, the coverage area is the essentially the same for the reformulated compliant acetone-lacquers, water-based topcoats, and substitute topcoats as it is for traditional lacquers. Hence, it is not expected that VOC emissions would increase as a result of lowering the VOC limit for lacquers to 550 g/l and later to 275 g/l. The assertion that high solids or substitute coatings have smaller coverage area is not consistent with information provided by the manufacturers' Material Safety Data Sheets (MSDS), technical data sheets, and coating can labels.

TABLE 3-1A

Lacquer - Traditional Coating (@680 g/l limit) Samples (12)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) @ 1-2 ½ mil	Drying Time Between Coats (hrs)
Deft Interior Clear Wood Finish	680	30	400	2
Akzo Nobel 60 Sheen S/G Lacquer	677	24.6	260	1-2
Akzo Nobel Full Gloss Lacquer	677	25	260	1-2
AMT Precatalyzed Lacquer	667	25	260	1-2
Dunn-Edwards Decolac Clear Gloss Lacquer	675	27.3	320	1-2
Dunn-Edwards Decolac Clear Semi-Gloss Lacquer	675	27.2	320	1-2
Dunn-Edwards Chrystaclear WW Gloss Lacquer	675	27.2	300	1-2
Dunn-Edwards Chrystaclear WW Semi-Gloss Lacquer	675	27.2	300	1-2
Fenzco Satin Finishing Lacquer	678	25.4	290	1
Lilly/Guardsman Hi Gloss Lacquer	680	24.9	260	1
Lilly/Guardsman Semi-Gloss Lacquer	680	25	260	1
Lilly/Guardsman White Semi-Gloss Lacquer	612	28.5	260	1
AVERAGE TOTAL of TRADITIONAL LACQUERS	**671**	**26.4**	**291**	**1.33**

TABLE 3-1B

Lacquer - Acetone Coating (@550 g/l limit) Samples (4)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) *@ 1-2 mil*	Drying Time Between Coats (hrs)
Akzo-Nobel 60 Sheen HS Acetone Topcoat	550	30.5	490	1
Coatings Resource Semi-Gloss ACE Lacquer	276	23	370	1
SPI Acetone Clear Gloss Lacquer	275	24.5	393	1
SPI Lo-VOC W/W Gloss Lacquer	550	24.3	390	1
AVERAGE TOTAL of ACETONE REFORMULATIONS	413	25.6	411	1

TABLE 3-1C

Varnish Coating (@350 g/l limit) Samples (10)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) @ 1-2 mil	Drying Time Between Coats (hrs)
Akzo Nobel 40 Sheen Aquaplaz Conversion Varnish	211	39.5	410	6
Behr Super Spar Varnish	333-349	62-64	600	12-24
Dunn-Edwards Syngloss Interior Gloss Varnish	350	63	600	16
Dunn-Edwards Synsatin Interior Semi-Gloss Varnish	345	63	600	16
Life Paint Acrylic/Urethane Super Spar Varnish	250	52	400	4
Life Paint Life Saver Clear Spar Varnish	345	58	400-600	8
Sherwin Williams Sher-Wood Kemvar "W" Water Reducible Conversion Varnish *(Industrial use only)*	275	46	640	1
Tru-Test Enrich Water-Base Satin Polyurethane Varnish	350	31	100	1
Tru-Test Enrich Water-base Gloss Polyurethane Varnish	350	30	100	1
Zinsser Ultra Poly Satin Quick 15 Varnish	275	33.5-35.5	450	2
AVERAGE TOTAL of VARNISHES	309	48	440	7.3

TABLE 3-1D

2- Component Polyurethane Coating (@350 g/l limit) Samples (29)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) @ 1-2 mil	Drying Time Between Coats (hrs)
American Formulating & Manufacturing Safecoat Polyurecsel	105	32	300-400	2
Behr Crystal Clear Interior Water-based Polyurethane	331-338	26-28	350	3-4
Behr Polyurethane	327-349	62-64	600	12-24
BonaKemi Pacific Ultra-Cure	350	32.5	500-600	1-2
BonaKemi Pacific Strong	350	34	500-600	1-2
BonaKemi Woodline Textured	350	32	500-600	1-2
BonaKemi Sport MVP	350	30	500-600	1-2
BonaKemi Sport Finish	350	34	500-600	1-2
Carver Tripp Super Poly	300	30	450	0.5
Defi 2-Component Urethane	335	72	970	8
Dunn-Edwards Acri-thane Gloss	250	27	450	2-4
Dunn-Edwards Acri-thane Semi-Gloss	260	27	450	2-4
Fuller O'Brien Mira Plate II 618-XX Gloss Waterborne Epoxy	137	48.2	300-400	2-4
Fuller O'Brien Mira Plate II 618-XX Satin Waterborne Epoxy	137	52.6	300-400	2-4
Life Paint Clear Polyurethane	345	62	400-600	8
Magee Waterthane 901, 941	295	25	700	2
Magee Waterthane 800	114	40	500	4-6
Magee Hi-Tech III Clear	301	72	275	4-5
Pinnacle Waterborne Urethane	275	26-47	350-575	4-16
Pittsburgh High Solids Polyester-Epoxy Gloss Solvent Base	313	77.3	175-265	1
Pittsburgh High Solids Polyester-Epoxy Semi-Gloss Solvent Base	338	76.3	175-265	1
Pittsburgh High Solids Acrylic-Epoxy Water Base Coatings	197	56	275-325	8
R.E. Hart Labs, Inc. HP-2001	0	60	400	6-8
R.E. Hart Labs, Inc. HP-100	0	60	333	3-5
Sherwin Williams Waterbased Catalyzed Gloss Epoxy	250	47	610	18-24
Sherwin Williams Waterbased Catalyzed Semi-Gloss Epoxy	250	50	642	18-24
Sherwin Williams Sher-Wood Water Reducible Gloss Urethane *(Industrial use only)*	212	28-30	425	1
Sherwin Williams Hi-Solids Polyurethane - Low VOC	269	65	1040	10
Sinclair Clear Acrylic Urethane	250	34	300-400	1
AVERAGE TOTAL of POLYs	253	44.9	474	5.4

TABLE 3-1E

Quick Dry Enamel (Pigmented) Coating (@400 g/l limit) Samples (13)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) @ 1-2 mil	Drying Time Between Coats (hrs)
American Formulating & Manufacturing Safecoat Gloss Enamel	201	45.2	300-350	2
Behr Premium Plus Hi-Gloss Enamel	236-250	47-50	400	4
Ellis Hy-Lux Waterborne Acrylic Enamel	250	34-44	480-520	1-2
Fuller O'Brien VersaFlex 615-XX Int/Ext. High Gloss Latex Enamel	247	37-40	350-400	8
Life Paint Quick Dry Enamel	333	72	400	6
Life Paint Quick Dry "Acrylic" Enamel	250	50	300-400	4
Sinclair Acrylic Urethane Enamel	232	47.3	300-400	1
Tru-Test X-O Rust Interior/ Exterior Enamel XO-Line	380	66.4	400	8
Tru-Test X-O Rust Waterborne Industrial Enamel TW-Line	250	44.5	400	8
Tru-Test Premium Gloss Polyurethane Floor & Porch Enamel DP-Line	380	62.6	450	8
Tru-Test Value Floor & Utility Enamel VE-Line	380	56.5	400	8
Union Carbide Gloss White Exterior Enamel *	125	53.1	400	4
Union Carbide Gloss Black Exterior Enamel *	204	40.6	400	2
AVERAGE TOTAL of ENAMELS	**270**	**51.1**	**396**	**5**

formulation suggestion

TABLE 3-1F

Waterbased Clear Topcoat Coating (@275 g/l limit) Samples (10)

	VOC content (gm/l)	Solids (%) *by Weight*	Coverage (sq. ft/gal) @ 1 mil	Drying Time Between Coats (hrs)
Akzo Nobel Gloss Waterborne Lacquer T/C	256	30.2	480	1-2
Cardinal Waterborne Wood Clear Topcoat	124	33	530	1-2
Frazee Waterborne Clear Satin Lacquer	260	37.4	540	1
Frazee Waterborne Clear Gloss Lacquer	258	37.1	550	1
Fuller O'Brien Clear Latex Wood Finish	135	37	400-500	18-24
Life Paint Clear Acrylic Wood Finish	250	29	400	4
Pinnacle Waterborne Acrylic	275	28-40	400-500	1-2
Sherwin Williams Sher-wood Water Reducible Interior Clear Wood Finish	240	31-33	475	1
Sherwin Williams Sher-wood Water Reducible Hi-Bild Clear Lacquer *(industrial use only)*	276	31-33	475	1
Sinclair Water Lacquer	80	32	510	1-2
AVERAGE TOTAL of WATERBASED REFORMULATIONS	**231**	**33.6**	**486**	**3.5**

TABLE 3-1G

Summary Of Coating Character Analysis

	Average VOC content (gm/l)	Average % of Solids by Weight	Average Coverage (sq. ft/gal) *@ 1-2 mil*	Average Drying Time Between Coats (hrs)
Lacquer - Traditional	671	26.4	291	1.33
Lacquer - Acetone	413	25.6	411	1
Varnish	309	48	440	7.3
2-Component Polyurethane (Water Based)	253	44.9	474	5.4
Quick Dry Enamel (Pigmented)	270	51.1	396	5
Water-based Clear Topcoat	231	33.6	486	3.5

TABLE 3-1H

Comparison Of Results With CARB's California-Wide Survey, 1990

	SCAQMD Survey Results		CARB Survey Results	
	Average VOC content (gm/l)	Average % of Solids by Weight	Average VOC content (gm/l)	Average % of Solids by Weight
Lacquer - Traditional	671	26.4	668	26
Lacquer - Acetone	413	25.6	*n/a*	*n/a*
Varnish	309	48	434	44.3
2-Component Polyurethane	253	44.9	*n/a*	*n/a*
Quick Dry Enamel (Pigmented)	270	51.1	402	65.8
Waterbased Clear Topcoat	231	33.6	302	28.8

Note: The CARB survey results in average exceedances beyond the present Rule 1113 requirement for varnishes and water-based clear topcoats.

As a comparison, Table 3-1H shows that the 1990 CARB Survey yielded similar results *for average VOC content* as the random sampling of alleged substitutes coatings to acetone-based lacquers and traditional lacquers. *The table shows that for most coatings the average VOC content has decreased over the past six years.*

The solids content has been stricken from this table. AQMD staff in the Draft SEA inadvertently listed the CARB solids content by weight. Further investigation has revealed, that the CARB data should be listed as solids content by volume. Since the AQMD survey is listed in solids by weight, a comparison to the CARB data is imprecise.

More Priming

Traditional lacquer is currently used as part of a three to four part coating system, applied after a stain and a sanding sealer. In oral and written testimony industry also raises the issue that if traditional lacquers are unavailable, compliant coatings will require additional coating steps or substitute coatings systems (which, they contend, may also require additional steps). Additional coating steps may include greater use of primers and possibly one to two more topcoats than would otherwise be required. Industry representatives testified at the May 24, 1996 public workshop that substitute coating systems would emit more VOC emissions per area covered as compared to traditional lacquer systems because of the need to apply additional coats. Industry representatives also testified that the use of water-based compliant topcoats, could require more priming (i.e., solvent-borne sanding sealer coats at 680 g/l) to prevent grain raising. Industry contends that this additional priming would increase overall VOC emissions for the coating system.

The AQMD evaluated the assertion that the use of substitutes or water-based topcoats would result in increased VOC emissions by comparing the VOC content of substitute coating systems to traditional lacquer systems. The following assumptions are based on extensive industry research conducted by the AQMD for the rule making processes for Rule 1136 and 1113. Stains, sealers, primers, and topcoats are assumed to have approximately the same coverage area (400 sq. ft.) and the same solids content except for 2-component urethane systems and pigmented systems which have higher solids content. To use a worst-case scenario, pigmented topcoats are assumed to be quick-dry enamels with ten percent thinning as applied and the two component topcoats are lacquer-based coatings. Table 3-2, illustrates that the use of substitute coating systems will actually result in significantly lower emissions than using a traditional lacquer system.

Table 3-2
Comparison of Coatings Systems

Coating System	Stain VOC Content g/l	Sanding Sealer VOC Content g/l	Primer VOC Content g/l	Topcoat VOC Content g/l	Total VOC lbs emitted
Traditional Lacquer	350	680		2 coats @ 680	19.93
Possible Lacquer Replacement Scenarios					
Acetone-based Lacquer	350	680		2 coats @ 550	17.76
Varnish	350	680		2 coats @ 350	14.42
Varnish	350			3 coats @ 350	11.67
Pigmented Replacements			350	2 coats @ 400	9.59
Pigmented Replacements			2 coats @ 350	2 coats @ 400	12.51
Two Component Systems	350	680		2 coats @ 350	14.42
Two Component Systems	350			3 Coats @ 350	11.67

The research and investigation conducted in the Rule 1136 rule making effort has revealed that there are many low VOC, 275 g/l water-based topcoats that do not promote grain raising. Therefore, if the coating is applied properly by a trained contractor, grain raising should not be an issue.

More Topcoats

Industry representatives have asserted that, since compliant acetone-based lacquers, water-based topcoats or substitutes will have a higher solids content, the area of coverage as compared to a traditional lacquer will be less; therefore, to get the same coverage the coating applicator will apply more coats which increases VOC emissions. As shown in the previous tables however, the compliant acetone-based lacquers and water-based topcoats

have the same or better coverage area as the traditional lacquers. Hence, it is not expected that a large quantity of topcoats will be necessary to cover the same area. There is no indication that increased coating usage is required with higher-solids coatings. The table demonstrates that industry representatives' assertion that alternative coating systems will yield greater VOC emissions is incorrect. Additional coats of lower-VOC coatings in such alternative coating systems still result in additional emission reductions over current lacquer use.

Industry also contends that using compliant coatings will require more topcoats because of the poorer performance of lower-VOC coatings. The Ventura County Air Pollution Control district (VCAPCD) conducted performance tests on a range of coatings from 1991 to 1992 (Cowan, 1992). The VCAPCD tested 49 different coatings representing clear wood finishes, quick dry enamels, quick dry primers, and industrial maintenance coatings. Both brush and spray applications were tested. The performances test evaluated ease of application, appearance, adhesion, hardness of topcoat, ability to cover extreme surface conditions (rusty metal, charred wood) and appearance after six months. A painter with Ventura County's Department of Facilities and Grounds did the painting and judged the application and appearance. Several observers from paint manufacturers and paint contractors oversaw the testing process. They found that these coatings performed well and that additional topcoats were not required.

More Touch-Ups and Repair Work

Industry contends that the compliant acetone-based lacquers, water-based topcoats, and substitutes will require more touch ups and repair work because longer drying times may allow for the contamination of the coated surface with air born dust and construction debris. Once the topcoat becomes contaminated and is no longer smooth or aesthetically pleasing, touch-ups and repairs may be required.

The use of "traditional" lacquer systems currently involve a three-step process which can require anywhere from several hours to all day for the topcoat to dry. Coating contamination problems with lower VOC lacquers are not, therefore, expected to differ from what they are now.

Industry representatives also assert that acetone reformulated lacquers dry much more quickly than "traditional" lacquer formulations which would be expected to reduce, not increase the amount of touch-up and repair work resulting from surface contamination.

Further, industry has commented that unfavorable field conditions (i.e., high humidity) coupled with acetone's rapid evaporation rate could cause the topcoat to blush. Although the blushing effect occurs with traditional lacquers, staff recognizes that the occurrence of blushing with an acetone-based lacquer may be more frequent due to its higher evaporation rate. For this reason, staff has included provisions in PAR 1113 to allow the use of a solvent-based retarder to slow down the evaporation rate of acetone on humid

days. The provisions will allow the addition of up to ten percent retarder on days when the humidity is greater than 70 percent and temperatures are below 65 °F. With these provisions, the amount of blushing that will occur with the use of an acetone-based lacquer should be diminished significantly. Thus, it is anticipated that the frequency of blushing with an acetone-based lacquer will be equivalent to that of a traditional lacquer. The retarder provision will be similar to the provisions allowed in Rule 1136.

To evaluate the effect on air quality of the retarder provision, staff performed the following a analysis. As part of a worst case air quality analysis, emissions were calculated assuming the addition of ten percent retarder on 365 days of the year which yields an annualized daily VOC emission average of 0.14 tons per day. Taking this worst-case assumption into account and including sell through, PAR 1113 still results in overall reduction of 6.8 tons per day of VOC emissions in 2010.

More Frequent Recoating

During public testimony received at the May 24, 1996 public workshop, industry asserted that reformulated acetone-based lacquers or water-based topcoats as well as substitute coatings could require more frequent recoating over a given period of time because they are less durable than traditional lacquers. Industry asserted that more frequent recoating over a given time period could be expected to result in greater VOC emissions per unit of area covered.

Durability numbers for lacquers and the asserted substitute coatings were not readily available from either manufacturers' product brochures or coating can labels. In an attempt to obtain some general durability information, staff contacted Chuck Donaldson who is a Customer Service Representative for Dunn-Edwards. Mr. Donaldson indicated that for Dunn-Edwards' lacquer (LQ-104 X Decolac-Semi Gloss) it is expected to hold-up for three to four years, if the edges are sealed properly. Whereas, Dunn-Edward's varnish (V 197 X Syngloss) could be expected to last 5 years or longer. Mr. Donaldson pointed out that the durability of a coating is dependent on many factors, including: surface preparation, application technique, substrate coated, and exposure conditions. Therefore, it is expected that if applied correctly, compliant coatings should be as durable as traditional lacquers.

More Reactivity

Based on various studies conducted in the field of atmospheric chemistry, many different types of VOCs are emitted into the atmosphere, each reacting at different rates and with different mechanisms. Reactivity is the ability of a compound to accelerate the formation of ground-level ozone. The architectural coatings industry has supported this viewpoint and is actually involved in financing additional studies to further study the actual mechanistic and kinetic reactivities of different VOC species. The industry believes that VOC control strategies which take reactivity into account can potentially achieve ozone

reductions in a more cost-effective manner than strategies which treat all non-exempt VOCs equally.

According to comments made by industry, it is alleged that solvents used in reformulated coatings may be more reactive than the solvents used in traditional lacquers. Different types of solvents have different degrees of "reactivity." Furthermore, industry contends that acetone-based lacquers and water-based coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October which is typically the peak ozone season.

The contention that more reactive solvents will be used in lieu of traditional less reactive solvents is somewhat misleading because traditional lacquers currently contain reactive and highly toxic solvents such as toluene, xylene, MEK, etc. Instead, *Harley* Hartley, et al., (1992) states, "The respeciated organic gas emissions from use of solvent-borne architectural coatings are 24% more reactive than the official [VOC] inventory would suggest."

CARB incorporated the idea of a reactivity-based control strategy into their California Clean Fuel/Low Emissions Vehicle regulations, where reactivity adjustments factors are employed to place regulations of exhaust emissions from vehicles using alternative fuels on an equal ozone impact basis. The CARB supports a similar strategy for consumer products and industrial emissions, and recently contracted Dr. William Carter, University of Riverside, Center for Environmental Research and Technology, College of Engineering, for a two year study to assess the reactivities of VOC species found in consumer products and industrial emissions inventory. Dr. Carter, a world renowned researcher of reactivities of various VOC species, will specifically evaluate glycol ethers, esters, isopropyl alcohol, MEK; and octanol, since these are typically found in both water-based and solvent-based coatings. These specific VOCs have been prioritized on contribution to overall emissions inventory, mechanistic reactivity uncertainties, and inconsistency in the current reactivity data. This information is needed to reduce the uncertainties regarding reactivity factors for reactive VOCs which may be useful in developing future reactivity-based control strategies. This study is proposed to be carried out between April 1996 and March 31, 1998.

To address the issue of reactivity of VOCs staff is currently working with CARB on their Reactivity Research Advisory Committee, recently formed to specifically evaluate reactivities of selected VOCs. Staff is also monitoring the progress with the North American Research Strategy for Tropospheric Ozone to evaluate research studies on reactivity conducted at the national level. In addition to the AQMD's participation in the aforementioned studies, Dr. Carter has been retained to carry out an experimental and computer modeling study to investigate the atmospheric ozone formation potential of selected VOCs emitted from consumer products and industrial sources.

As noted previously, acetone, discussed in the previous sections, has been de-listed by the EPA, CARB, and AQMD as a reactive VOC because of the preponderance of scientific data indicating its very low level of reactivity. Recent analysis conducted for AQMD Rule 102 - Definition of Terms and Rule 1136 - Wood Coatings indicates widespread use of products reformulated with acetone is expected. All indications are, therefore, that less, not more, reactive organic compounds are likely to be used in lacquer reformulations using acetone.

Other solvents contained in lacquers need further study to determine their relative reactivities and ultimate contribution to photochemical smog or ozone formation. The previously cited *Harley*Hartley, et al., (1992) article reiterates the importance of developing reactivity numbers for such solvents by stating, "It was not possible to determine source contributions...for surface coating and domestic solvent use (due to a lack of ambient concentration data for key marker compounds). There is a need for further study of the chemical composition of industrial surface coatings and the detailed composition of petroleum distillate solvents incorporated in surface coatings. In the future, it is recommended that speciated organic gas measurement programs include alcohols, glycols, and glycol ethers as part of the ambient concentration data sets. Availability of such data for these species would help to resolve the contributions from organic gas emission sources such as surface coatings and domestic solvent use." (Ibid, page 2406).

Dr. Carter has compiled information regarding the reactivity of VOCs and he has established several different reactivity scales. He cautions the use of these scales, however, due to the uncertainties involved; for example, "Deriving such numbers is not a straightforward matter and there are a number of uncertainties involved. One source of uncertainty in reactivity scales comes from the fact that ozone impacts of VOCs depend on the environment where the VOC is emitted. A second source of uncertainty is variability in the chemical composition of the VOC source being considered. Complex mixtures such as "mineral spirits" may be more difficult to characterize and may vary from manufacturer to manufacturer though in principal the composition of a given lot can be determined and reasonably assumed to be constant regardless of how the product is used. A third source of uncertainty comes from the complexity and uncertainties in the atmospheric processes by which emitted VOCs react to form ozone (Carter, 1995).

Dr. Carter believes that reliable reactivity numbers do not currently exist from which accurate air quality policy can be derived based on reactivity and not total VOC emissions. According to Dr. Carter, ketones are the most important class of consumer emissions for which there are no environmental chamber reactivity data suitable for evaluating reactivity predictions. Also, he finds no experimental reactivity data for glycols or alcohols suitable for mechanism evaluation. (Ibid. page 6). These are all components of current lacquer formulations, for which reactivity numbers do not exist.

Another factor to be considered in the reactivity based approach, and probably the most important, is an accurate speciation profile of water-based and solvent-based coatings. Dr. Albert C. Censullo, Professor of Chemistry, California Polytechnic State University, San Luis Obispo, conducted a comprehensive assessment of species profiles for a number of sources within the general categories of industrial and architectural coating operations. The study was intended to upgrade the existing species profiles, which were last analyzed in 1991. The compositions of industrial and architectural coatings have changed significantly in the last few years due to regulatory changes at the national, state, and local levels.

As a part of the Censullo study, 52 water-based coating samples were analyzed and species profiles were determined by using an average of at least two analyses. The four most common solvents in water-based coatings were identified as Texanol, propylene glycol, diethylene glycol butyl ether, and ethylene glycol, all of which were identified by Dr. Carter as needing further reactivity assessment.

Additionally from the Censullo study, emission profiles were obtained for 54 solvent-based coating samples. The results were significantly more complex as compared to the species profiles for the water-based samples, primarily due to the various petroleum fractions used in solvent-based coatings. Some of the species profiles resulted in several hundred components from one sample. Dr. Carter has compiled reactivity data on several of the specifies identified, but has also indicated the need to further assess the reactivity of MEK, isopropyl alcohol, other alcohols, and esters found in solvent-based coatings. This updated species profile is an important first step in focusing the attention of researchers in assessing overall reactivity and its contribution to ozone formation.

In spite of the studies identified above, reactivity data on VOC, especially those compounds used to formulate consumer and commercial products, is extremely limited. "Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC control strategy." (USEPA, 1995). Current studies are underway with more work being planned for the future with respect to assigning reactivity numbers for various key chemical compounds found in coatings.

The reactivity issue is also currently under study by the EPA. Section 183(e) of the 1990 amendments to the Clean Air Act (CAA) requires the EPA to develop a control strategy for VOC emissions from consumer and commercial products taking into account the photochemical reactivities of such emissions. "The EPA must...consider those products which emit 'highly reactive' species of VOCs and list those consumer and commercial products that account for at least 80 percent of the VOC emissions on a 'reactivity adjusted' basis in ozone nonattainment areas." (Ibid, page 3-1).

With respect to water-based reformulated coatings, the architectural coating industry also concurs with the AQMD's technical assessment that reactivity will not significantly affect

the reaction of total VOC reductions on reducing ozone formation in the South Coast Basin. At a 1991 joint SCAQMD/CARB Conference on Reactivity-Based Hydrocarbon Controls: Scientific Issues and Potential Regulatory Applications, a paper was presented by coating industry representatives entitled, *"Application of Reactivity Criteria to Architectural Coatings."* This paper asserts that "...approximately 68% of the volume of architectural coatings made and used in California are waterborne flat coatings and waterborne primers, sealers, and undercoaters, with a weighted average VOC content of 80 g/L. This is so much lower than the VOC content of the solvent-based flat coatings replaced...that reactivity is probably not a significant issue with regard to these coatings." (page 4)

The science of VOC reactivity is still in the early stages, with more comprehensive studies still being conducted to resolve the uncertainties of reactivity data. The District supports the concept of potentially using a VOC reactivity-based approach in its strategy to meet the ozone standard. Experts in the field, including Dr. Carter, have indicated the need to improve estimates of atmospheric ozone reactivity factors for selected major classes of compounds in the consumer product and industrial emissions inventory, and to improve the quantification of the uncertainty ranges of atmospheric reactivity factors for the classes of species typically found in coatings.

The District believes that it would not be prudent to implement a reactivity-based ozone reduction strategy based on incomplete science. Therefore, the District will continue to monitor and participate in all studies related to enhanced reactivity data for VOC species.

In the absence of actual reactivity numbers for the compounds contained in "traditional" lacquer formulations and compliant, low-VOC coatings, emissions must be calculated in the standard manner of total VOC per unit of coating applied manner. Based upon the current state of knowledge regarding VOC reactivity, it is speculative to conclude that the proposed amendments will generate significant adverse air quality impacts due to increased reactivity.

A list of coatings which are already available to comply with the proposed VOC content limits is included as Appendix C of this document.

Flat Coatings

The allowable VOC content for flat (interior and exterior) coatings is proposed to be lowered from 250 g/l to 100 g/l in 2001 and to 50 g/l in 2008. The direct air quality effect of reducing the VOC content limit for flats is a 2.7 tons per day emission reduction in 2001 and 3.5 tons per day emission reduction in 2001. Based upon an AQMD survey of compliant materials, flat coatings that meet both the 100 g/l and the 50 g/l limit are currently available. Paint formulators' comment letters submitted to the AQMD in 1990 as part of the Rule 1129 - Aerosol Coatings rule development process indicated that, "latex coatings contain less than 50 g/L of VOC." (Major Paint Company, October 24,

1990). EL RAP, the industry trade association, also commented in October 1990 by stating, "at least 90 percent of the coatings currently used for graffiti abatement are latex flat paints that have an average VOC content of approximately 60 g/L." Therefore, according to leading industry representatives compliant materials have been widely used in the Basin for at least the past six years. Based on the 1990 sales data collected by CARB, 40 percent of all flats sold had VOC levels less than or equal to 100 g/l.

Currently, five coating manufacturers produce and sell zero-VOC flat paints which contain no volatile solvents at all. One of the comment letters received on the Notice of Preparation/Initial Study states that, "low-VOC and zero-VOC flat coatings have been formulated to meet market demand for (relatively) odorless paints..." A list of coatings which are already available to comply with the proposed VOC content limits is included as Appendix C of this document.

Recently, AQMD staff witnessed the application of zero-VOC flat coatings (ICI, Glidden Lifemaster 2000) at a Bel Air residence. According to the paint contractor, hired by David Hertz who is a prominent architect and who is charged with the remodeling of this residence, the zero-VOC flat coating offered the following desirable qualities:

- self- priming;
- good coverage, more coverage than higher VOC content flats;
- no odors;
- one coat application;
- good hiding power; and
- no thinning required.

Although compliant materials are currently available to meet the proposed rule limits, industry has asserted that coatings at the lower end of the VOC content range are not, however, adequate substitutes for coatings at the higher end. Based upon available information, AQMD staff recognizes that not all flat coatings would be appropriate for all application scenarios. Therefore, PAR 1113 allows almost five years for development of additional 100 g/l products and 12 years for the development of additional 50 g/l flats. Such delays in the final compliance dates for flat coatings are consistent with the industry's estimate of necessary research and development time required to perfect flats at these VOC levels for all applications. Industry representatives asserted at the May 24, 1996 public workshop for PAR 1113 that 3 - 5 additional years would be required for research and development time to formulate coatings in these ranges with consistent performance characteristics for a wide variety of applications. Chemistry and resin technologies are rapidly evolving to meet the needs of this and many other industries which rely heavily on chemicals as raw materials and the exact chemical composition of the formulations of future products would be impossible to predict and analyze at this

time. Since the rule allows up to an additional 12 years for the development of ultra-low VOC flat coatings, substitution of other coatings such as industrial maintenance, opaque stains, or primers etc. for flats in the short-term is not expected to occur.

The AQMD will conduct and complete a technical assessment one year prior to the compliance dates for each of the lower limit implementation dates to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products.

PAR 1113 also allows an optional averaging provision for the flat category which should help companies comply with these lower VOC limits by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales weighted average VOC content equal to that in the rule.

Given the long time frame to develop compliant flat coatings, as well as providing an option by which industry can demonstrate compliance with VOC content limits through averaging, no significant indirect adverse air quality impacts, such as those discussed for lacquers are expected for flat coatings. Therefore, no significant indirect adverse air quality impacts from amending the VOC content requirements for flat coatings are anticipated.

Traffic Coatings

The direct air quality effect of reducing the VOC content requirements for traffic coatings is a 1.4 ton per day emission reduction. AQMD staff found 20 coatings that comply with the proposed 150 g/l VOC limit. Although no single traffic marking material can be used in all applications, a combination of low- and zero-VOC-emitting marking materials can provide the performance necessary for highway safety. Overall annualized costs of using water-based and zero-VOC coatings are lower than their solvent-based counterparts. A partial list of compliant coatings is included in Appendix B of this document.

The 1990 CARB Survey and AQMD staff survey all indicate that compliant traffic coatings are commercially available and are being used by local governments, and CAL Trans, as well as professional contractors at all levels. Conversations with local manufacturers of traffic coatings, including Morton International and Pervo Coatings, verify development and commercial introduction of acetone-based solvent-based formulations, as well as the water-based and 100 percent solids coatings already being used.

No significant indirect adverse air quality impacts, such as those discussed for lacquers were identified or raised by industry for traffic coatings. Therefore no significant indirect adverse air quality impacts from amending the VOC content requirements for traffic coatings are anticipated.

A list of coatings which are already available to comply with the proposed VOC content limits is included as Appendix C of this document.

Multi-Color Coatings

No major issues were identified for multi-color coatings due to the recent refinements in water-based formulations. Two of the largest manufacturers of multi-color coatings have been selling non-compliant coatings under a variance for the past year. The largest manufacturer, with over 70 percent of the market share, has successfully formulated a water-based coating that performs as well as their solvent-based formulations. This coating has found wide commercial acceptance, especially in hotels, healthcare facilities, and office complexes, where solvent odor is a major concern. The new water-based coatings have a VOC content of approximately 100 g/l, well below the required 250 g/l. The other major manufacturer has also successfully developed a water-based formulation and has been marketing the product for over a year.

No significant indirect adverse air quality impacts such as those discussed for lacquers were identified or raised by industry for multi-color coatings. Therefore no significant indirect adverse air quality impacts from amending the VOC content requirements for multi-color coatings are anticipated.

A list of coatings which are already available to comply with the proposed VOC content limits is included as Appendix C of this document.

Based on the preceding analysis of potential direct and indirect air quality effects of implementing PAR 1113, it is concluded that:

1. Increasing the VOC content of japans, magnesite coatings, ~~tub-and-sink repair coatings~~, and fire-proof coatings will result in an VOC emission increase of 200 pounds per day. As a result, air quality impacts are considered significant.

2. Once the lower VOC content limits are implemented the overall air quality effects of the PAR 1113 will be a VOC emission reduction of approximately *10.5* ~~10.6~~ tons per day by the year 2010.

PROJECT SPECIFIC MITIGATION MEASURES: No feasible mitigation measures have been identified to minimize the short-term air quality impacts associated with the proposed amendments while still achieving the objectives of the project. CEQA defines "feasible" mitigation measures as those that are "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" (Public Resources Code Section 21061.1).

REMAINING IMPACTS: Since PAR 1113 will result in an overall long-term air quality benefit, no adverse impacts remain.

CUMULATIVE IMPACTS: Implementing PAR 1113 and all AQMP control measures will result in an overall VOC emission reductions *which will contribute to attaining and maintaining* ~~sufficient to attain~~ the state and federal ambient air quality standards for ozone. Cumulative air quality impacts will be insignificant even in conjunction with the additional VOC emissions of 0.55 tons per day from the ~~proposed reinstatement of the~~ quart container exemption *that was adopted at the August 9, 1996 Governing Board Meeting. This increase of VOC emissions has been accounted for in the Draft 1997 AQMP.* This conclusion is consistent with the conclusion regarding cumulative air quality impacts contained in the 1994 AQMP Final Program EIR *and the Draft 1997 AQMP Final Program EIR.*

CUMULATIVE IMPACT MITIGATION: No mitigation measures are required because cumulative air quality impacts are not significant.

COMPARISON OF AIR QUALITY IMPACTS FROM ALTERNATIVES

PAR 1113 is expected to achieve *10.5* ~~10.6~~ tons per day of VOC emission reductions overall by the year 2010, assuming no sell through or retarder use. The following discussions compare the alternatives relative to the proposed project in terms of expected emission reductions and potential adverse impacts.

ALTERNATIVE A (NO PROJECT) SPECIFIC IMPACTS: This alternative assumes that PAR 1113 will not be adopted. The variance which allows for the sale of higher-VOC content coatings for japans, magnesite cement coatings, ~~tub-and-sink repair coatings~~, and fire-proof coatings would expire. The No Project Alternative would not allow the products' continued sale or use of these products at a higher VOC content limit. Disallowing the sale and use of these coatings at a higher VOC content limit would create an air quality benefit of 0.1 tons per day compared to a VOC emission reduction of *10.5* ~~10.6~~ tons per day *from* ~~for~~ PAR 1113. No other changes would be implemented to the VOC content requirements *as amended by the 1990 court order* for any of the other coating categories currently regulated by Rule 1113.

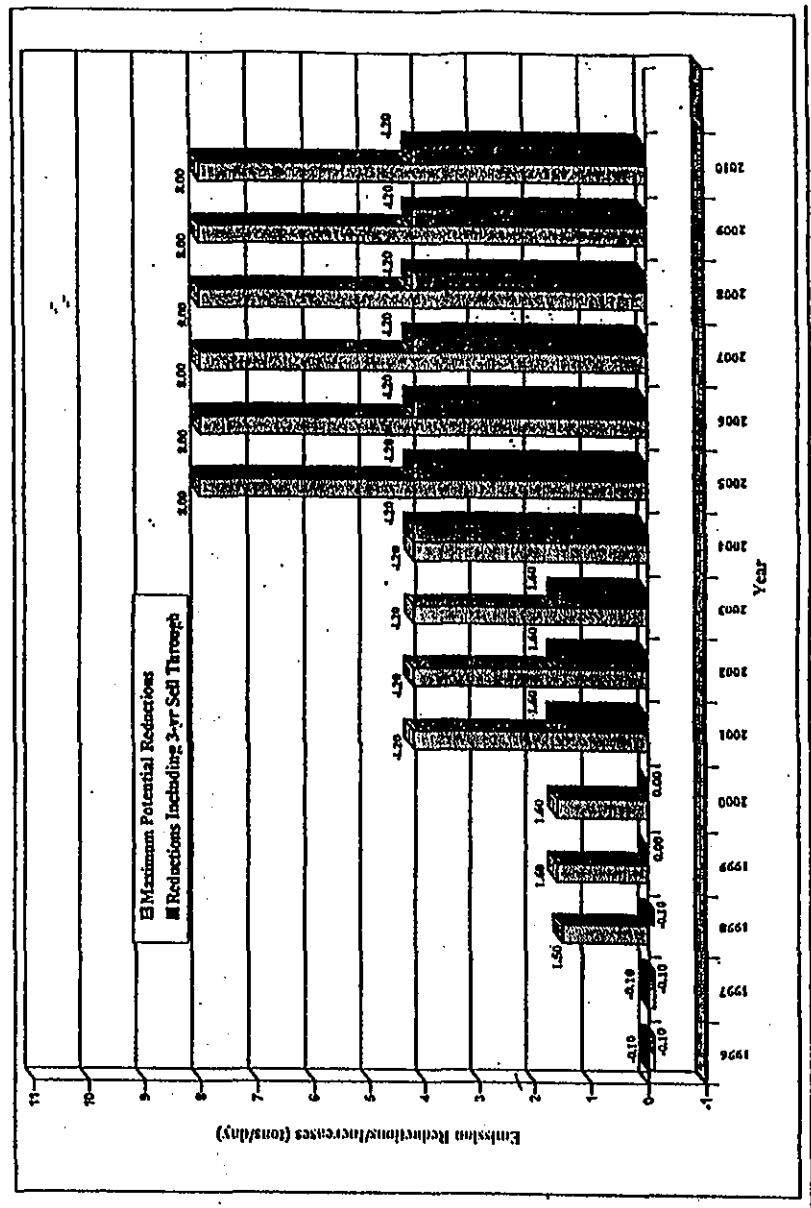
ALTERNATIVE B (NO EMISSION LIMIT CHANGES FOR LACQUERS) SPECIFIC IMPACTS: This alternative would reinstate the VOC content for lacquers of 680 g/l. No further reductions in the VOC content limit of lacquers would be required. The other proposed VOC content limit changes in PAR would be maintained. Possible methods which may be used to reach lower VOC limits include using acetone reformulations and water-based formulations. As shown in Figure 3-2, assuming no sell

through, this alternative would result in estimated daily VOC emission reductions by *the year* 2010 of *8.00* ~~8.10~~ tons per day. This alternative would achieve 2.5 tons per day less VOC emission reductions than the proposed project.

Like PAR 1113, this alternative will have a short-term significant adverse air quality impact if it is implemented. Since this alternative retains provisions relaxing the VOC content limits for fire-proofing coatings, magnesite cement coatings, *and* japan coatings~~; and tub and sink repair coatings~~ until January 1, 1999, VOC emissions increase of 0.10 ton per day (200 lbs/day) will occur for a year and a half until the proposed lower VOC content limits go into effect on January 1, 1998 for traffic coatings and multi-color coatings.

000412

Figure 3-2
Emission Reductions/Increases from Alternative B



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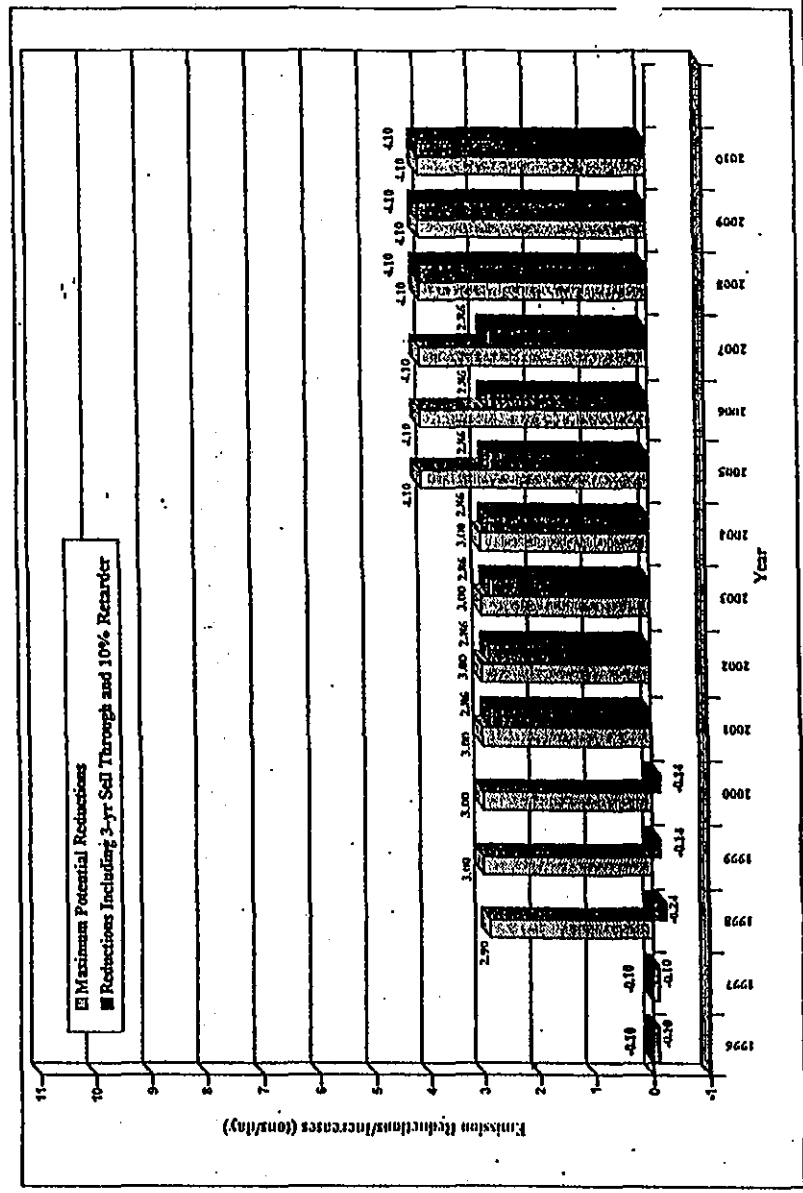
ALTERNATIVE C (NO EMISSION LIMIT CHANGES FOR FLATS) SPECIFIC IMPACTS: This alternative would maintain the VOC content limit for flat coatings at 250 g/l. No further reductions in the VOC content limit for this category of coatings would be required. The other proposed VOC content limit changes would be retained. Possible methods which may be used to reach lower VOC limits include using acetone reformulations and water-based formulations. As shown in Figure 3-3, assuming no sell through or retarder use, this alternative would result in estimated daily VOC emission reductions by 2010 of 4.10 tons per day. This alternative would achieve 6.4 6.5 tons per day less VOC emission reductions than the proposed project.

Like PAR 1113, this alternative will have a short-term significant adverse air quality impact if it is implemented. Since this alternative would also relax the VOC content limits for fire-proofing coatings, magnesite cement coatings, *and* japan coatings, and tub and sink repair coatings until January 1, 1999, an VOC emissions increase of 0.10 ton per day (200 lbs/day) will occur for a year and a half until the proposed lower VOC content limits go into effect on January 1, 1998 for traffic coatings and multi-color coatings.

Figure 3-3
Emission Reductions/Increases from Alternative C



ALTERNATIVE D (NO INTERIM EMISSION LIMITS FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed interim limits for lacquers of 550 g/l effective January 1, 1998 and for flats of 100 g/l effective July 1, 2001. This alternative would require that only the final compliance limits of 275 g/l effective January 1, 2005 for lacquers and 50 g/l effective July 1, 2008 for flats be met. It is anticipated that these limits could be met through water-based reformulations. As shown in Figure 3-4, assuming no sell through, this alternative would result in estimated daily VOC emission reductions by 2010 of *10.5* ~~10.6~~ tons per day. This alternative would ultimately achieve the same VOC emission reductions as the proposed project.

Unlike PAR 1113, however, Alternative D will not generate interim air quality benefits. For example, between January 1, 1998 and January 1, 2005, PAR 1113 would have a greater air quality benefit by reducing VOC emissions from lacquers. This is illustrated in Table 3-3.

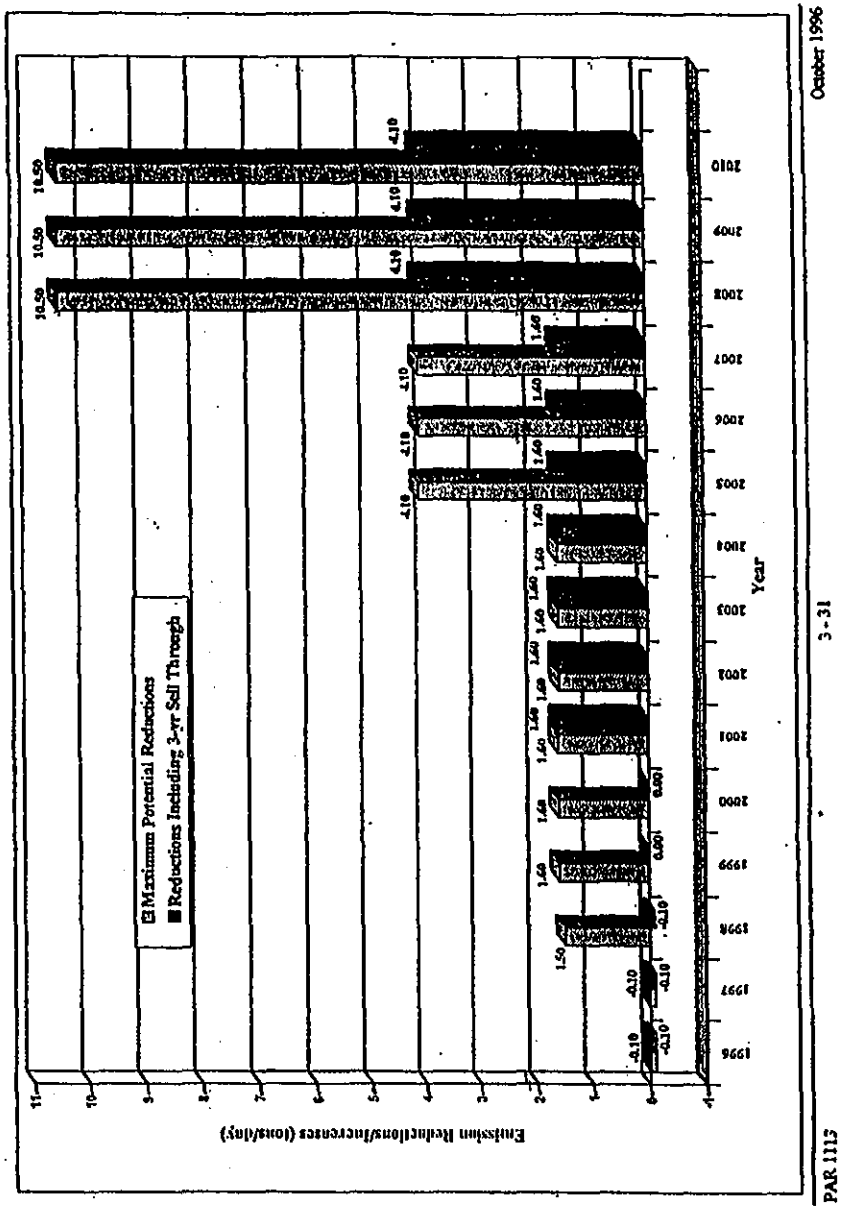
TABLE 3-3

Net Emission Difference (PAR 1113 vs. Alternative D)

Year	Net Emission Difference (tons/day)
1998	*1.40* ~~1.30~~
1999	1.40
2000	1.40
2001	*1.00* ~~4.10~~
2002	*1.00* ~~4.10~~
2003	*1.00* 4.10
2004	*1.00* ~~4.10~~
2005	*2.60* ~~2.70~~
2006	*2.60* ~~2.70~~
2007	*2.60* ~~2.70~~
2008	0
2009	0
2010	0

Similarly, Alternative D will not generate interim air quality benefit for flats between July 1, 2001 and July 1, 2008. Like PAR 1113, this alternative will have a short-term significant adverse air quality impact if it is implemented. Since this alternative maintains the relaxing of the VOC content limits for fire-proofing coatings, magnesite cement coatings, *and* japan coatings, ~~and tub-and-sink repair coatings~~ until January 1, 1999, a VOC emissions increase of 0.10 ton per day (200 lbs/day) will occur for a year and a half until the proposed lower VOC content limits go into effect on January 1, 1998 for traffic coatings and multi-color coatings.

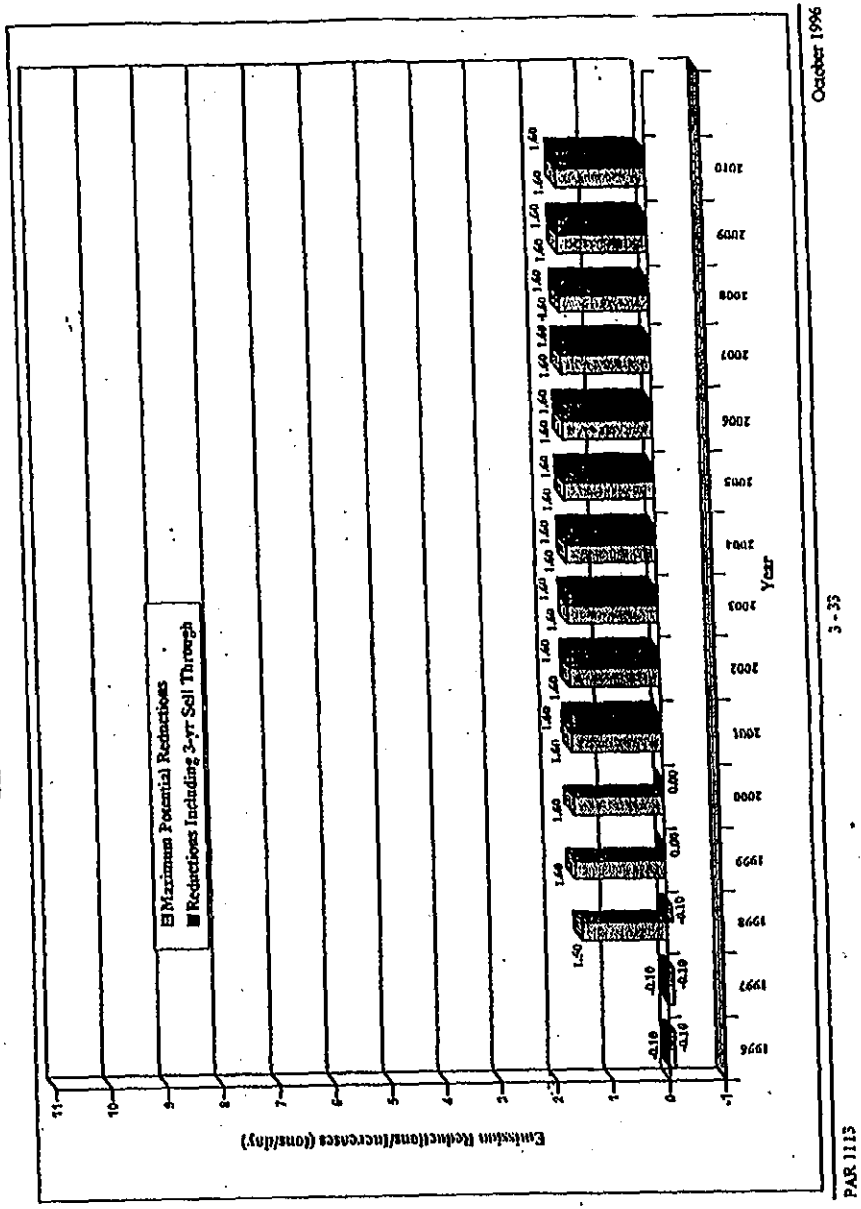
Figure 3-4
Emission Reductions/Increases from Alternative D



ALTERNATIVE E (NO EMISSION LIMIT CHANGES FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would re-establish the 680 g/l VOC content limit for lacquers and would require no further reduction in the VOC content of this coating category. This alternative would also allow the continued VOC content for flats to remain at 250 g/l. The other proposed limit changes would be maintained. Possible methods which may be used to reach lower VOC limits include using acetone reformulations and water-based formulations. As shown in Figure 3-5, assuming no sell through, this alternative would result in estimated daily VOC emission reductions in 2010 of 1.6 tons per day. This alternative would achieve *8.90* ~~9.0~~ tons per day less VOC emission reductions than the proposed project.

Like PAR 1113, this alternative will have a short-term significant adverse air quality impact if it is implemented. Since this alternative maintains the relaxing of the VOC content limits for fire-proofing coatings, magnesite cement coatings, *and* japan coatings, ~~and tub and sink repair coatings~~ until January 1, 1999, a VOC emissions increase of 0.10 ton per day (200 lbs/day) will occur for a year and a half until the proposed lower VOC content limits go into effect on January 1, 1998 ~~1998~~ for traffic coatings and multi-color coatings.

Figure 3-5
Emission Reductions/Increases from Alternative E



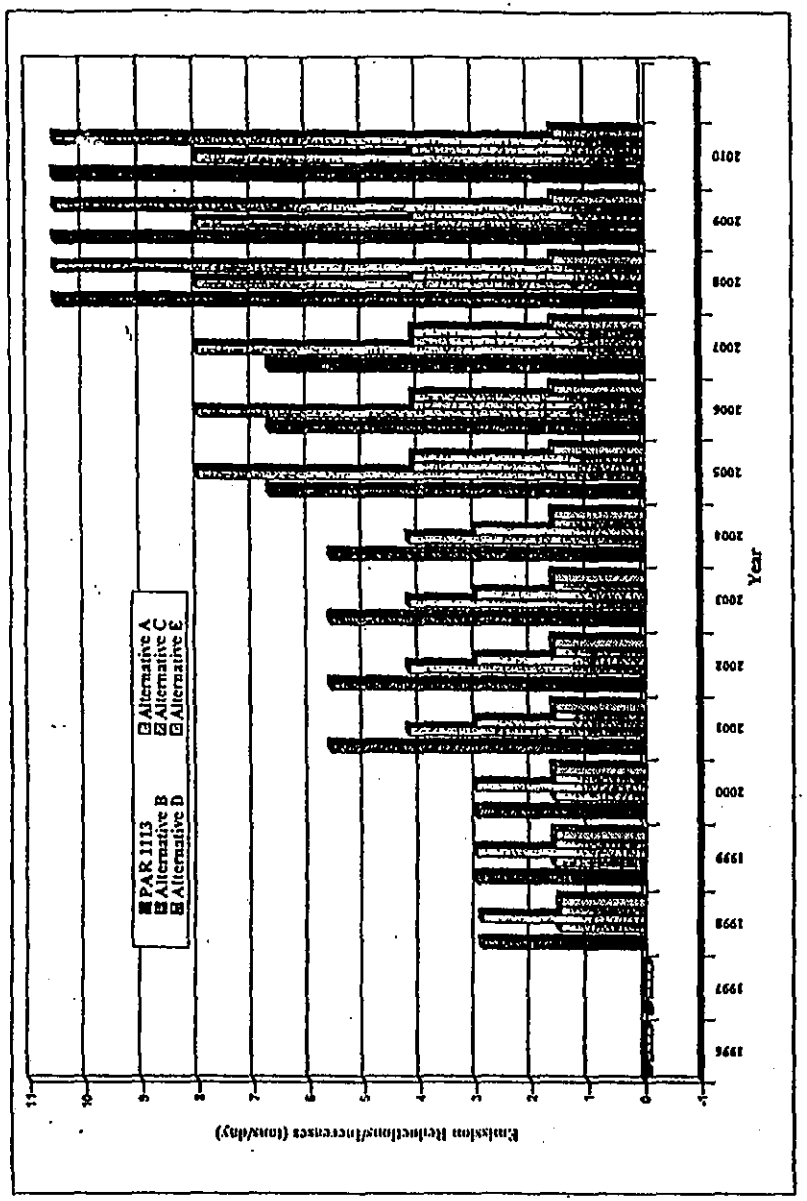


Figure 3-6
Comparison of Proposed Project vs. Project Alternatives

000420

Comparison Of Impacts And Alternatives

Figure 3-6 provides a graphical comparison of the direct air quality impacts for PAR 1113 and each of the project alternatives. A matrix presented in Table 3-4, lists the significant adverse impacts for air quality as well as the cumulative impacts associated with the proposed project and the project alternatives for all other environmental topics analyzed. The Table also provides a comparison within each impact section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another. For example, under the Air Quality Impact column numbers in brackets would represent the ranking of the proposals to one another as far as short-term worst case adverse impacts (including rule delays, sell through, and retarder use). A ranking of (3) in this case would mean that the proposed project and Alternative C would have the most significant adverse impacts in the short-term. However, for the remaining impact sections, bracketed numbers would indicate the ranking of a proposal in the context of having the least to the worst impacts.

Columns with check marks denote whether a proposal has project specific adverse impacts or cumulative impacts or both. Columns that are blank denote that a proposal does not have project specific adverse impacts or cumulative impacts.

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TABLE 3-4

Comparison of Impacts and Alternatives

Project/ Alternative	Air Quality Impacts		Odor Impacts		Water Quality Impacts		Water Demand Impacts		Human Health Impacts		Risk of Upset Impacts		Fire Departm Impact	
	Sign. Impacts	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*	*Sign. Impacts*	*Cum. Impacts*
PAR 1113	✓(1)		(1)		(4)		(4)	✓	(1)	✓	(1)		(4)	
A	(3)		(6)		(1)		(1)		(6)		(6)		(1)	
B	✓(3)		(5)		(2)		(2)		(4)	✓	(4)		(2)	
C	✓(1)		(1)		(3 5)		(3 5)	✓	(1)	✓	(1)		(4)	
D	✓(3)		(5)		(4)		(4)	✓	(3)	✓	(3)		(3)	
E	✓(3)		(4)		(3 4)		(3 4)		(5)	✓	(5)		(1)	

Notes: The ranking scale is such that 1 represents the least impacts and subsequent higher number represent increasingly higher worst impacts.
The same two numbers in brackets for a specific Impact Section means that these proposals would have the same impacts if implemented.
A check mark denotes either a significant adverse impact or cumulative impact.
A blank in a column denotes no significant adverse impact or no cumulative impact.

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ODOR IMPACTS

Significance Criteria:

The project will be considered to have significant odor impacts if objectionable odors are created from the implementation of the project.

IMPACTS: As already indicated, it is likely that acetone will be used to reformulate compliant coating products as it was recently de-listed as a reactive VOC. Acetone has strong odors, though so do some of the compounds it may replace. Local governments often have authority to protect the public from adverse odors. Historically, the AQMD has enforced odor complaints through AQMD Rule 402 - Nuisance.

Individuals can differ quite markedly from the population average in their sensitivity to odor, due to a variety of innate, chronic or acute physiological conditions. This includes olfactory adaptation or smell fatigue (i.e., continuing exposure to an odor usually results in a gradual diminution or even disappearance of the smell sensation). Table 3-5 lists the odor thresholds for some common coating solvents. This information was obtained from the MSDS for each coating solvent. Table 3-5 illustrates the fact that acetone used as a replacement for other traditional solvents may have less odor impacts. As mentioned earlier, it is expected that acetone will be used to meet the interim VOC content limit for lacquers. In the future, it is expected that lacquers will be reformulated with water to meet the final VOC content limit.

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TABLE 3-5
Comparison of Odor Thresholds for Some Common Coating Solvents

Solvent	Threshold (PPM*)
Acetone	13
Toluene	2.9
Xylene	1.1
MEK	5.4
EGBE	2.5
EGEE	2.7
EGME	2.3

Source: New Jersey Department of Health
*Measurement Indicates Minimum Concentration Detectable by Smell

Therefore, no significant additional odor impacts are expected to result from the use of acetone-based compliant coatings.

Currently available low-VOC and zero-VOC compliant flat coatings have little or no odors associated with their use as they are preferred for use in hospitals, day care centers, convalesce homes, etc.

For flats, it is anticipated that water-based products will be reformulated with *a lesser volume of* ~~lower VOC~~ coalescing solvents ~~than currently used solvents~~ to meet the lower VOC content limits. Since the VOC content limits do not go into effect until the years 2001 and 2008, which is 5 and 12 years from now, it is not known at this time what replacement coalescing solvents will be used. However, given that PAR 1113 allows sufficient time for manufacturers to develop compliant flat coatings and solve any odor problems associated with these reformulated compliant coatings, no significant adverse odor impacts are expected from lowering the VOC content limits for flat coatings.

Further, it would seem that since the volume (less than five percent typically) of coalescing solvents is small in water-based products, their odor concentration would be small in the atmosphere, therefore, odor impacts are not expected.

AQMD staff will conduct and complete a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products.

A matrix of exposure limits and toxicity of the chemical constituents found in coatings is included in the following discussions regarding Hazard Impacts.

PROJECT SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since odor impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: The AQMD has examined PAR 1113 to determine potential significant cumulative odor impacts including odors. No significant additional odor impacts are expected to result from implementing PAR 1113, and no significant cumulative adverse odor impacts are anticipated. This determination is consistent with the 1994 AQMP Final Program EIR which concluded that implementing all AQMP control measures would not generate significant adverse cumulative odor impacts.

CUMULATIVE IMPACT MITIGATION: None required.

COMPARISON OF ODOR IMPACTS FROM ALTERNATIVES

ALTERNATIVE A (NO PROJECT) SPECIFIC IMPACTS: This alternative assumes that PAR 1113 will not be adopted. Odors associated with existing coatings would continue. Based on the information presented in Table 3-5, it appears that odor impacts from current solvents have higher or similar odor threshold values than acetone. Therefore, if the No Project Alternative was implemented, odor impacts would be expected to be greater or similar to the odor impacts associated with PAR 1113.

ALTERNATIVE B (NO EMISSION LIMIT CHANGES FOR LACQUERS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for lacquers. This alternative would allow the continued VOC content for lacquers to remain at 680 g/l. Since Alternative B lowers VOC content limits for traffic coatings and multi-colored coatings, which may be reformulated with acetone, although not significant, odor impacts are expected to be similar to the odor impacts associated with PAR 1113. However, the amount of reformulated acetone-based coatings would be less since lacquers are not included. Therefore, since there would be less acetone-based coatings used in the district it is anticipated that Alternative B could have slightly greater odor impacts than the proposed project. Although not significant, odor impacts from reformulating the remaining coating categories would be comparable to those identified for PAR 1113 because the VOC content limits are the same as those in PAR 1113.

ALTERNATIVE C (NO EMISSION LIMIT CHANGES FOR FLATS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for flats.

This alternative would allow the continued VOC content for flats to remain at 250 g/l. The other proposed limit changes would be maintained. Since it is expected that acetone could be used to reformulate lacquers (interim limit), traffic coatings, and multi-color coatings to meet the proposed lower VOC content limits, this alternative would result in the same odor impacts as the proposed project.

ALTERNATIVE D (NO INTERIM EMISSION LIMITS FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed interim limits for lacquers of 550 g/l effective January 1, 1998 and for flats of 100 g/l effective July 1, 2001. This alternative would require that only the final compliance limits of 275 g/l effective January 1, 2005 for lacquers and 50 g/l effective July 1, 2008 for flats be met. The other proposed limit changes would be maintained. Since Alternative D lowers VOC content limits for traffic coatings and multi-colored coatings in 1998, which may be reformulated with acetone, odor impacts are expected to be similar to the odor impacts associated with PAR 1113. However, the amount of reformulated acetone-based coatings used would be less since lacquers are not included. Therefore, since there would be less acetone-based coatings being used in the district it is anticipated that Alternative D would have more odor impacts than the proposed project.

For flats, it is expected that coatings manufacturers will *reformulate current water-based flat coatings with a lesser volume of* ~~replace higher VOC content coalescing solvents in current water-based formulations with lower VOC~~ content coalescing solvents to meet the 50 g/l VOC content limit in 2008. Thus, no additional odor impacts are expected.

ALTERNATIVE E (NO EMISSION LIMIT CHANGES FOR LACQUERS AND FLATS) SPECIFIC IMPACTS:

This alternative would remove the proposed lower VOC content limits for lacquers and flats. This alternative would allow the continued VOC content for lacquers and flats to remain at 680 g/l and 250 g/l, respectively. Since Alternative E lowers VOC content limits for traffic coatings and multi-colored coatings, which may be reformulated with acetone, odor impacts are expected to be similar to the odor impacts associated with PAR 1113. However, the amount of reformulated acetone-based coatings would be less since lacquers are not included. Therefore, since there would be less acetone-based coatings being used in the district it is anticipated that Alternative E would have more impacts than the proposed project.

Please refer to Table 3-4 at the end of the Air Quality Impact section, to see how the proposals (proposed project and project alternatives) rank next to one another. It is expected that none of these proposals would have significant odor impacts if implemented.

WATER IMPACTS

Significance Criteria:

The project will be considered to have a significant impact on water resources if any of the following occur:

- The capacities of existing or proposed wastewater treatment facilities are insufficient to handle increase wastewater from the project;
- Substantial degradation of surface water or ground water quality;
- Substantial depletion of ground water or surface water resources; or
- The existing water supply is insufficient to handle project increases in demand.

IMPACT - WATER QUALITY: As previously established in this *Final* ~~Draft~~ SEA, it is anticipated that coating manufacturers will reformulate lacquers, flats, traffic coatings, or multi-color coatings with either acetone or water to meet the proposed VOC limits. Further, it is expected that some manufactures will use acetone in their formulations to meet the 1998 VOC limits. Since acetone formulated coatings are not expected to be able to comply with the year 2005 VOC content requirements, it is anticipated that lacquers will be reformulated with water. For flats, it is envisioned that manufacturers will use *lesser amounts of* different coalescing solvents *in their water-based formulations* with ~~lower VOC~~ contents to meet both the year 2001 and 2008 VOC content limits.

Short-term Impacts

Since it is likely that acetone will be used to comply with the VOC content requirements for traffic coatings multicolor coatings, and lacquers complying with the 1998 VOC content limits, it is possible that accidental releases of these acetone-formulated coatings could create significant adverse water quality impacts. As explained below, replacing currently used solvents, e.g., toluene, xylene, MEK, etc., is not expected to generate significant adverse surface or groundwater quality impacts. As part of this rule making effort AQMD staff conducted over 60 unannounced visits at industrial parks and new housing construction sites in an effort to evaluate coating and cleanup practices. During the site visits, AQMD staff surveyed contractors regarding their thinning practices, coating application techniques, and clean-up practices. Out of 32 responses received from the contractors on their clean-up practices, 22 (7) percent indicated that they dumped their waste material into the ground, 56 (18) percent indicated that they used a disposal

company to handle waste material, and 22 (7) percent indicated that they recycled their waste material as thinner. This survey demonstrates that a majority of the contractors either dispose of the waste material properly as required by the coating manufacturer's MSDS or recycle the waste material. This practice is expected to continue with acetone-based compliant coatings.

Ground Water Impacts

It is assumed for this analysis that those who recycle their waste coatings will continue to do so and those who dump their waste coatings will also continue to do so. Even if it is assumed that those who currently recycle their waste coatings will instead dump them illegally, significant adverse surface and/or groundwater impacts are not anticipated from PAR 1113. The reason for this conclusion is that acetone volatilizes much more rapidly than the currently used solvents it will be replacing. As a result, acetone is expected to volatilize before it reaches groundwater or surface water sources. This conclusion is supported by the Agency for Toxic Substances and Disease Registry and the New Jersey Department of Health suggests that the use of acetone as a replacement solvent could have the same or less impacts on ground water quality than traditional coating solvents (i.e., toluene, xylene, and MEK) because it volatilizes very rapidly into the air and it is biodegradable. As can be seen from Table 3-6, acetone has less hazardous physical and chemical characteristics than currently used solvents.

Table 3-6
Ecological Information for Coating Solvents

Characteristic	Toluene	Xylene	MEK	Acetone
Soluble in Water	Slightly Soluble	Insoluble	Highly Soluble	Highly Soluble
Ambient Concentration in Water	3.0 ppb	1.0 ppb	Not Available	Not Available
EPA Drinking Water Limit	1.0 ppm	0.44 ppm (Proposed)	No Established Limit	No Established Limit
Acute Toxicity to Aquatic Life	Moderate	High	Slight	Slight
Chronic Toxicity to Aquatic Life	Moderate	High	Slight	Slight
Bioaccumulation Concentrations in Fish	Slightly Greater Than Ambient Concentrations	Somewhat Greater Than Ambient Concentrations	Same as Ambient Concentrations	Same as Ambient Concentrations
Volatility	Rapid	Rapid	Slow	Rapid
Persistence in Water	2 days	2 days	2 - 20 days	2 - 20 days
Biodegradability	Slight	Slight	Moderate	High
Binds With Soil	Yes (Particularly High Organic Soils)	Yes	No	No
EPA Reportable Quantity	1,000 Pounds	1,000 Pounds	5,000 Pounds	5,000 Pounds

Wastewater and Surface Water Impacts

As stated above and reiterated here, PAR 1113 is not expected to increase the illegal activity of dumping waste material into either the sewer system or storm drainage systems. Hence, no significant adverse impacts are expected to occur to downstream publicly owned treatment works (POTWs) or aquatic bodies as a result of the proposed amendments. As established in the Table 3-6, large concentrations of traditional solvents are not expected to appear in wastewater or surface water because of their quick evaporation rates and because they represent (typically) 5 to 30 percent of coating formulations. Because of acetone's higher vapor pressure, (180 mmHg at 68 °F versus 70 mmHg at 68 °F for MEK; 22 mmHg at 68 °F for toluene; and 7 mmHg at 68 °F for xylene) and its biodegradability, it is expected that the same or lower levels of acetone would appear in waste water or surface water than is currently the case with traditional solvents.

Furthermore, the EPA in its Report to Congress entitled "Study of Volatile Organic Compound Emissions from Consumer and Commercial Products," evaluated consumer products to determine which categories were likely to be disposed of to POTWs. The study found that the likelihood of paints, primers, and varnishes being disposed of to POTWs was low. Therefore, this category was not even evaluated for its VOC emission impacts on POTWs. This suggests that the presence of solvents from this category of consumer products in waste water streams is very low compared to the total volume of solvents being disposed of from other consumer product categories.

Public outreach programs such as the National Paints and Coatings Association's (NPCA), *"Managing Leftover Paint: Six Ways You Can Help Protect the Environment"* and *"Paint Disposal...The Right Way,"* aimed at educating the public and contractors with respect to environmentally sound coating disposal practices are also expected to reduce the amount of coating waste material entering the sewer systems, storm drainage systems, and being dumped on the ground.

Future Water Quality Impacts

Wastewater

It is envisioned that coating manufacturers will reformulate lacquers with water to meet the year 2005 VOC content limit of 275 g/l. This implies that more water will be used for clean-up and the resultant water-based waste material will be dumped into the sewer system. Similarly, for flats, it is expected that compliant reformulations that meet the years 2001 and 2008 VOC content limits will be water-based. Thus, use of water based compliant coatings could adversely affect local POTWs' ability to handle this incremental waste material.

To evaluate the amount of wastewater expected to be generated, it is expected that the current practice of using water to clean-up flat coatings equipment (i.e., spray guns,

rollers, and brushes) is expected to continue in the future. The reason for this assumption is that currently available flat coatings are all water based. As a result, the amount of water-based flat coatings waste material that would be disposed of into the storm drainage systems and the ground as result of PAR 1113 is not expected to be greater than the amount of waste material that would have been generated without PAR 1113. Although Table 3-7 shows an increase in the amount of wastewater generated through cleanup of flat coatings equipment, this increase is based solely on a CARB survey that projects that sales of flat coatings will increase eight percent per year in the future.

Table 3-7 illustrates, that the "worst case" potential increase of waste material likely to be received by the POTWs in the district as a result of the proposed amendments. The potential increase is well within their existing and projected capacity. Hence, wastewater impacts associated with the disposal of water based flat and lacquer clean-up waste material are not considered significant.

Table 3-7
Projected POTW Impact From Reformulated Coatings

Year	POTW Average Daily Flow[a] (mgd)[e]	POTW Capacity[b] (mgd)	Flat Clean-up[c] (mgd)	Lacquer Clean-up[d] (mgd)	Total Clean-up (mgd)	Total Impact (% Increase)
1996	1671.00	2005.20	0.040	0.001	0.041	0.0024
1997	1671.00	2005.20	0.043	0.001	0.044	0.0026
1998	1671.00	2005.20	0.046	0.001	0.047	0.0028
1999	1671.00	2005.20	0.050	0.001	0.051	0.0031
2000	1691.00	2029.20	0.054	0.001	0.055	0.0033
2001	1691.00	2029.20	0.058	0.001	0.059	0.0035
2002	1691.00	2029.20	0.063	0.001	0.064	0.0038
2003	1691.00	2029.20	0.068	0.001	0.069	0.0041
2004	1691.00	2029.20	0.073	0.001	0.074	0.0044
2005	1691.00	2029.20	0.079	0.001	0.080	0.0048
2006	1691.00	2029.20	0.086	0.001	0.087	0.0052
2007	1691.00	2029.20	0.092	0.002	0.094	0.0056
2008	1691.00	2029.20	0.100	0.002	0.102	0.0060
2009	1691.00	2029.20	0.108	0.002	0.110	0.0065
2010	1691.00	2029.20	0.117	0.002	0.119	0.0070

[a] 1990 total average daily wastewater flows handled by all POTWs in the district. Includes Eastern Municipal Water District tripling their capacity in 2000.

[b] Based on average daily flows of 80% of total POTW capacity. Does not include wet weather peak capacity.

[c] See Table 3-6 for explanation of how these figures were derived. The figures for Flat Clean-up expressed in mgy are converted to mgd by dividing by 365.

[d] See Table 3-6 for explanation of how these figures were derived. The figures for Lacquer Clean-up expressed in mgy are converted to mgd by dividing by 365.

[e] mgd = millions of gallons per day

Ground Water and Surface Water

It is anticipated that in the future coating manufacturers will reformulate lacquers with water to meet the year 2005 275 g/l VOC content limit. These low-VOC coatings may contain a small percentage by volume of ethylene glycol ethers or ethylene glycol ether acetates. These and other potential replacement solvents, however, are considered hazardous air pollutants (HAPs) by the EPA and are subject to the requirements of the 1990 Clean Air Act amendments (CAAA). These and other national and state-level regulatory forces may promote the use of non-HAPs such as propylene glycol ethers or propylene glycol ether acetates in coating reformulations. Hence, it is speculative to

analyze at this time what the ground water and surface water quality impacts would be associated with lowering the lacquer VOC content limit to 275 g/l in 2005.

For flats, it is expected that coatings manufacturers will *reformulate current water-based formulations with lesser amounts of* ~~replace higher VOC content coalesing solvents in current water-based formulations with lower VOC content~~ coalescing solvents to meet the 100 g/l VOC content limit in 2001 and the 50 g/l VOC content limit in 2008. Since these flat reformulations will be water-based, it is expected that the current practice of using water to clean-up coating equipment (i.e., spray guns, rollers, and brushes) will continue in the future. Thus, the amount of water-based flat waste material that would be disposed of into the storm drainage systems and the ground as result of PAR 1113 is not expected to be greater than the amount of waste material that would have been entering these disposal paths without PAR 1113. No significant adverse water quality impacts are expected as result of PAR 1113.

While illegally dumping water containing residue of latex paint into a storm drain may be practiced by some private citizens or contractors, it is not expected that this practice will increase as a result of this proposed project. In fact, because of the NPCA's public outreach campaign aimed at educating consumers with respect to environmentally sound paint disposal practices, it is expected that illegal disposal of coatings will decrease.

Currently, some manufacturers use HAPs as the coalescing solvents in their water-based flat formulations. As mentioned above, national and state-level regulatory forces may promote the use of non-HAPs such as propylene glycol ethers or propylene glycol ether acetates in coating reformulations. Further, according to an article entitled "Clean Air Act Amendments" which appeared in the October 1995 edition of the Painting and Coatings Industry Magazine, "Coatings that meet or surpass end-user standards can be produced using low-VOC and non-HAPs-formulating technology, which enable compliance with legislation driven by the 1990 CAAA." This implies that non-HAP solvent containing coatings can be manufactured now to meet the 1990 CAAA requirements.

The AQMD will conduct a technical assessment one year prior to each VOC content limit going into effect for lacquers and flats to determine what the state of coating technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products. If new environmental impacts are identified at that time, these issues will be addressed as required by the CEQA guidelines.

Potential water quality impacts could also be further minimized by the use of an optional averaging provision *for flats* which should help companies comply with the proposed lower VOC limits by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales weighted average VOC content equal to that in the rule. Since current solvents

would be used in the higher VOC content coatings and the disposal practices associated with them would continue, no additional water quality impacts would be expected.

Based upon the preceding analyses, PAR 1113 is not expected to create significant adverse water quality impacts for the following reasons. Use of acetone to comply with the 1998 VOC content requirements for lacquers is expected to result in equivalent or lesser water quality impacts than currently used solvents because acetone volatilizes more rapidly and is, generally, more biodegradable. Further, because currently available flat coatings are already water based, no additional water quality impacts from future compliant flat coatings are expected because these coatings are also expected to be water based. Finally, PAR 1113 is not expected to promote the use of compliant coatings formulated with hazardous solvents that could create water quality impacts because state and federal regulations are expected to promote the use of coatings formulated with non-hazardous solvents. In addition, PAR 1113 allows sufficient time for research and development of coatings formulated with non-hazardous solvents.

PROJECT-SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since water quality impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: Even if improper disposal practices were to increase, it is not expected that PAR 1113 would create significant adverse cumulative water quality impacts because the solvent of primary concern, acetone, would be expected to create less severe water quality impacts because of its environmentally safer physical and chemical characteristics. As shown in Table 3-5, the disposal capacity of the local POTWs can process the projected insubstantial increases in any coatings wastes generated by PAR 1113. Therefore, no significant adverse cumulative impacts are expected from PAR 1113. The need for new systems or substantial alterations to existing systems will not be required as a result of implementation of PAR 1113. This finding is consistent with the conclusion regarding water quality impacts in the Final EIR for the 1994 AQMP.

CUMULATIVE IMPACT MITIGATION: None required.

IMPACT - WATER DEMAND: In the Initial Study for PAR 1113, staff identified potential water demand impacts that could occur if compliant coatings are reformulated with water. To analyze these impacts, staff has projected what the water demand impacts would be as a result of using water to clean-up water based coatings. As shown in Table 3-8, water demand impacts associated with the clean-up of water-based lacquers and flats (included as a worst case), presently and in the future, create a negligible incremental water demand impact.

It is envisioned that coating manufactures will reformulate lacquers with water to meet the year 2005 275 g/l VOC content limit. As a result, water instead of solvent-based clean-up

material will be used to clean-up coating equipment. Thus, more water will be used in conjunction with the coating of lacquers than is presently the practice.

It is expected that current water-based formulations of flat coatings will be reformulated with *lesser amounts of* ~~lower VOC content~~ coalescing solvents to meet the year 2001 VOC content limit of 100 g/l and the year 2008 VOC content limit of 50 g/l. It is expected that the current water clean-up practices associated with existing flats will not change or increase as result of PAR 1113.

Based upon the above analyses, no significant water demand impacts are expected as the result of implementing PAR 1113.

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Table 3-8
Projected Water Demand for Reformulated Coatings

Year	Projected Population[a] (millions of people)	Projected Water Demand[b] (bgy)	Projected Water Supply[c] (bgy)	Projected Flat Sales[d] (mgy)	Flat Clean-up[e] (mgy)	Projected Lacquer Sales[f] (mgy)	Lacquer Clean-up[g] (mgy)	Total Clean-up[h] (mgy)	Total Impact[i] (% Increase)
1996	16.00	1108.40	1391.37	14.48	14.48	0.40	0.40	14.88	0.0013
1997	16.25	1133.64	1391.37	15.64	15.64	0.41	0.41	16.05	0.0014
1998	16.50	1159.29	1391.37	16.89	16.89	0.43	0.43	17.32	0.0015
1999	16.75	1184.93	1391.37	18.24	18.24	0.44	0.44	18.68	0.0016
2000	17.00	1210.57	1391.37	19.70	19.70	0.45	0.45	20.15	0.0017
2001	17.25	1236.21	1391.37	21.28	21.28	0.47	0.47	21.74	0.0018
2002	17.50	1261.86	1391.37	22.98	22.98	0.48	0.48	23.46	0.0019
2003	17.75	1287.50	1391.37	24.82	24.82	0.49	0.49	25.31	0.0020
2004	18.00	1313.14	1391.37	26.80	26.80	0.51	0.51	27.31	0.0021
2005	18.25	1338.79	1651.37	28.94	28.94	0.52	0.52	29.47	0.0022
2006	18.50	1364.43	1651.37	31.26	31.26	0.54	0.54	31.80	0.0023
2007	18.75	1390.07	1651.37	33.76	33.76	0.56	0.56	34.32	0.0025
2008	19.00	1415.71	1651.37	36.46	36.46	0.57	0.57	37.04	0.0026
2009	19.25	1441.36	1651.37	39.38	39.38	0.59	0.59	39.97	0.0027
2010	19.50	1467.00	1651.37	42.53	42.53	0.61	0.61	43.14	0.0028

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[a]Population projections obtained from MWD Internet Web Page site. Reference MWD FACT Sheet.

[b]Water Demand Projections obtained from MWD Internet Web Page site. Reference MWD FACT Sheet. As a worst case all of MWD's service area water demand is included.

[c]Assumes MWD provides 60% of water supply in their service area. Remaining 40% provided by other water districts or municipalities. MWD 1996 baseline figure obtained from MWD's 1995 Annual Operating Plan. Includes 600,000 AF from water transfers, 178,000 AF from recycling programs, 30,000 from water reclamation, 153 AF from desalination plant to be on-line in 1999, and the construction of a 797,546 AF reservoir by 2005. AF (acre- feet) equals approximately 326,000 gallons.

[d]The 1990 CARB Survey sales data is used as the baseline for 1996. It is assumed that 45% of the total 1990 sales occurred in the district. It is projected that coating sales will increase by 8% (1% from individuals and 7% from contractors) per year. Reference The Coatings Agenda America 1995/1996 articles entitled "Demand Led by Do-It-Yourselfers" and "Holding on in the Face of a Blizzard."

[e]Assumes that one gallon of water will be used to clean-up equipment for every gallon of coating applied. Also assumes as a worst case scenario, that full conversion of lacquers to water-based formulations occurs in 1996.

[f]The 1990 CARB Survey sales data is used as the baseline for 1996. It is projected that coating sales will increase by 3% per year. Reference The Coatings Agenda America 1995/1996 article entitled "Cleaner Air Means Stringent Standards."

[g]Assumes that one gallon of water will be used to clean-up equipment for every gallon of coating applied.

[h]Total amount of flat clean-up and lacquer clean-up.

[i]The percentage increase in water demand as a result of the incremental increase due to water clean-up of water-based coating material.

Acronyms: bgy = billion gallons per year mgy = millions of gallons per year

Even assuming a "worst-case" scenario that it takes two gallons of clean-up water for every gallon of coating applied, water demand impacts would still not be considered significant because this increase is such a small percentage of the total water supply for the district. Further, it is within the capacity of the local water suppliers to supply this small increase in water demand.

The MWD and other water providers are currently exploring various strategies for increasing water supplies and maximizing the use of existing supplies. Options include storage of water from existing sources, use or storage of water unused by other states or agricultural agencies, and advance delivery of water to irrigation districts. These continuing and future water management programs assure that the area's full-service water demands will be met at all times.

The AQMD staff will conduct a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products.

Based upon the above analyses, no significant water demand impacts are expected as the result of implementing PAR 1113.

PROJECT-SPECIFIC MITIGATION: None required.

REMAINING IMPACTS: None.

CUMULATIVE IMPACTS: Implementation of PAR 1113, taken in conjunction with other AQMP control measures to be implemented in the future, may result in cumulatively significant water demand impacts. The 1994 AQMP Final Program EIR found that as a result of the implementation of all control measures, significant water demand impacts could occur because of the use of control equipment, dust suppressants, and tree planting. Since PAR 1113 is part of the AQMP strategy (Control Measure #94CTS-07) for reducing VOC emissions, and has slight water demand impacts, cumulative significant water demand impacts may occur as the result of implementing these amendments in conjunction with the future implementation of other AQMP control measures.

CUMULATIVE IMPACT MITIGATION: The project specific mitigation measures associated with the implementation of the 1994 AQMP will help to reduce the cumulative water demand impacts.

COMPARISON OF WATER IMPACTS FROM ALTERNATIVES

ALTERNATIVE A (NO PROJECT) SPECIFIC IMPACTS: This alternative assumes that PAR 1113 will not be adopted. No change in the current quantities of coatings entering the sewer systems, storm drainage systems, or the ground within the district should occur under the No Project Alternative because current practices are expected to be maintained. The impacts from the use of current coatings products would remain under the No Project Alternative. As a result of not implementing the proposed VOC content limit for lacquers of 275 g/l, which is anticipated to be met through water-based reformulations, this alternative would have slightly less but still slight water demand impacts compared to the proposed project.

ALTERNATIVE B (NO EMISSION LIMIT CHANGES FOR LACQUERS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for lacquers. This alternative would allow the VOC content for lacquers to remain at 680 g/l. The other proposed limit changes would be maintained.

As a result of not implementing the proposed VOC content limit for lacquers of 275 g/l, which is anticipated to be met through water-based reformulations, Alternative B would have less but still slight water demand impacts compared to the proposed project.

For flats, it is expected that coatings manufacturers will *reformulate existing water-based formulations with lesser amounts of* ~~replace higher VOC content coalescing solvents in current water-based formulations with lower VOC content~~ coalescing solvents to meet the 100 g/l VOC content limit in 2001 and the 50 g/l VOC content limit in 2008. It is expected that the current water clean-up practices associated with existing flats will not change ~~increase~~ as a result of this alternative.

Current practices associated with traffic coatings and multi-color coatings clean-up and waste material disposal are not expected to change as a result of implementing this alternative.

ALTERNATIVE C (NO EMISSION LIMIT CHANGES FOR FLATS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for flats. This alternative would allow the VOC content for flats to remain at 250 g/l. The other proposed limit changes would be maintained.

Since it is expected that lacquers would be reformulated with water in the future to meet the year 2005 VOC content limit of 275 g/l, this alternative would result in the similar insignificant water demand impacts as the proposed project.

Current practices associated with traffic coatings and multi-color coatings clean-up and waste material disposal are not expected to change as a result of implementing this alternative.

ALTERNATIVE D (NO INTERIM EMISSION LIMITS FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed interim limits for lacquers of 550 g/l effective January 1, 1998 and for flats of 100 g/l effective July 1, 2001. This alternative would require that only the final compliance limits of 275 g/l effective January 1, 2005 for lacquers and 50 g/l effective July 1, 2008 for flats be met. The other proposed limit changes would be maintained.

Since it is expected that lacquers would be reformulated with water in the future to meet the year 2005 VOC content limit of 275 g/l, this alternative would result in the similar insignificant water demand impacts as the proposed project.

For flats, it is expected that coatings manufacturers will *reformulate current water-base formulations with lesser amounts of*~~replace higher VOC content coalescing solvents in current water-based formulations with lower VOC content~~ coalescing solvents to meet the 50 g/l VOC content limit in 2008. It is expected that the current water clean-up practices associated with existing flats will not change or increase as result of this alternative.

Current disposal practices associated with traffic coatings and multi-color coatings clean-up waste material are not expected to increase as a result of implementing this alternative.

ALTERNATIVE E (NO EMISSION LIMIT CHANGES FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed lower VOC content limits for lacquers and flats. This alternative would allow the VOC content for lacquers and flats to remain at 680 g/l and 250 g/l, respectively. The other proposed limit changes would be maintained.

As a result of not implementing the proposed VOC content limit for lacquers of 275 g/l, which is anticipated to be met through water-based reformulations, Alternative *E* B would have less but still slight water demand impacts compared to the proposed project.

Current practices associated with traffic coatings and multi-color coatings clean-up and waste material disposal are not expected to increase as a result of implementing this alternative.

Please refer to Table 3-4, to see how the proposals (proposed project and project alternatives) rank to one another. It is not expected that any these proposals would have significant water quality impacts if implemented.

As mentioned in the cumulative water demand impact discussion for PAR 1113, a determination of significant adverse cumulative water demand impacts is necessary if PAR

1113, Alternative C, or Alternative D are implemented. This is based on the fact that the 1994 AQMP Final Program EIR found that significant water demand impacts would occur as a result of the implementation of all control measures

HUMAN HEALTH/HAZARDS IMPACTS

Significance Criteria:

The project will be considered to have a significant adverse hazard or human health impact if any of the following occur:

- The project emits toxic air contaminants listed in AQMD Rule 1401 that exceed a maximum individual cancer risk of 10 in one million (10×10^{-6}).
- The project emits toxic air contaminants listed in AQMD Rule 1402 that exceed a hazard index of 5.0.
- There is the potential for a substantial net increase in exposure to hazardous materials or the project is in conflict with existing regulations, plans or policies related to risk of upset or emergency response procedures

Direct Human Health Impacts for Acetone-based Compliant Reformulations

IMPACT: In the Initial Study for PAR 1113, staff identified potential human health impacts that could occur if compliant coatings are reformulated with more hazardous materials. To evaluate these potential impacts, staff has compared the toxicity of common currently used coating solvents to solvents found in reformulated, compliant coatings. As a measure of toxicity, staff compared: the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygiene (ACGIH), OSHA's Permissible Exposure Limits (PELs), the Immediately Dangerous to Life and Health (IDLH) levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. As shown in Table 3-9, the reformulation of lacquers and other coatings with acetone should have less human health impacts than current coating formulations. Acetone has a higher TLV, PEL, and IDLH than all of the other solvents presented in Table 3-9. Also acetone has the same health hazards or less than the other solvents.

TABLE 3-9
Toxicity of Coating Solvents

Solvents	TLV (ACGIH) (ppm)	PEL (OSHA) (ppm)	IDLH (ppm)	Health Hazard
Acetone	750	750	20,000	Mild irritation - eye, nose, throat; narcosis
Toluene	100	200	2,000	Moderate irritation - eye, nose, throat; narcosis: skin; suspect teratogen; mutagen
Xylene	100	100	1,000	Mild irritation - eye, nose, throat: narcosis; skin
MEK	200	200	3,000	Mild irritation - eye, nose, throat: narcosis
Isopropanol	400	400	12,000	Mild irritation - eye, nose, throat: narcosis
Butyl Acetate	150	150	10,000	Moderate irritation - eye, nose, throat; narcosis
Isobutyl Alcohol	50	100	8,000	Mild irritation - eye, nose, throat; suspect carcinogen
EGBE	25	50	700	Mild irritation - eye, nose, throat; anemia; skin
EGME	5	25		Cumulative CNS; skin: suspect reproductive effects; blood disorders
EGEE	5	200	Not Available	Cumulative blood damage; moderate irritation of eyes, throat, skin
Ethylene Glycol	50	50	80	Cumulative CNS and blood (anemia) effects; kidney damage
Stoddard Solvent	100	500	5,000	Narcosis: mild irritant
Petroleum Distillates (Naptha)	100	400	10,000	Mild Irritation; narcosis

Table 3-10 indicates the percent by weight of toxic substances contained in current coating formulations. Human health impacts are not expected to be significant because acetone will be used to replace constituents currently found in lacquer formulations which have much greater toxicity levels.

Table 3-10
Comparison of Toxic Constituents in Various Coatings

Product Name	Acetone	Toluene	Xylenes	n-Butyl Acetate	Glycol Ether	Petroleum Distillates (Naphtha)	Cellulose Nitrate	Other Constituents*	Total Coating VOC (g/l)	Flash point (degree F)
	% WEIGHT *(those ingredients > 5%)*									
Dunn- Edwards Crystalclear Water White Lacquer			15	15		15		10, 5	675	24
Desolac Clear Lacquer		20		10			10	5	675	24
Solventborne Varnish						45			350	105
Sherwin Williams Hi Gloss Lacquer		14				19			685	23
Surface Protection Ind. Gloss Lacquer	45			10					550	-1
Clear Gloss Lacquer	45				5	5		25	275	-4
Guardsman Hi Gloss Lacquer		14		25		9		8	680	25
Lilly Semi-Gloss Lacquer	27			41				6	629	0
AMT Clear T/C		10				10		10, 10	534	-1
Cardinal Waterborne Clear T/C								5.4	275	
Akzo-Nobel Full Gloss Lacquer		7.4		5-10		10-15	5-10	5-10, 5-10	677	14
Acetone T/C	25-35			15-25			5-10		550	-4

* Other constituents include Isobutyl Acetate, Butyl Carbitol, P-Chlorobenzotrifluoride, Ethyl-3-Ethoxypropionate, Isopropanol, n-Butyl Alcohol, Ethyl Alcohol, 2-Heptanone, Methyl Isobutyl Ketone.

Available toxicity data suggests that acetone does not pose any greater or more significant health threats in the normal concentrations likely to be encountered in the work place. The increase in acetone usage at any one location is likely to be marginal. The recent de-listing of acetone is unlikely to cause significant adverse toxicological impacts in the district. Please refer to Appendix B for a more detailed discussion of acetone and its toxicological effects.

Human health impacts are not expected to be significant. The adoption of PAR 1113 is expected to result in acetone being used to replace solvents currently found in lacquer formulations. Those other solvents have much greater toxicity characteristics. As a result, no adverse human health impacts are expected.

Direct Human Health Impacts for Water-based Compliant Reformulations (Lacquers)

IMPACT: Some coating formulators currently use toxic compounds (i.e., glycol ethers - EGBE) in their water-based wood coating formulations. The adverse of EGBE impacts were analyzed in the September 1995 Environmental Assessments for the Rule 1136 (Wood Coatings) proposed rule amendments. The analysis of human health impacts from using reformulated wood coatings containing toxic substances identified the maximum amount of coating that could be applied at a facility without exceeding the hazard index significance criteria of 5.0. This previous analysis is summarized and included in Appendix B. As shown in Table B-1 of Appendix B, the amount of coating that can be applied without exceeding the hazard index of 5.0 varies depending on the weight percentage of the toxic substance in the coating. Using the Rule 1402 methodology for calculating the hazard index, the smallest volume of coatings containing 10 percent EGBE that could be applied in any one day at a facility/site is about 30 gallons. For PAR 1113, the most likely place where this amount of compliant water-based wood coatings containing EGBE could be applied in any one day would be at a new home construction site. However, because new housing tracts are completed in phases and coating of wood substrates would typically occur in no more than three to four houses at any one time, it is unlikely that 30 gallons per day of water-based compliant coatings containing EGBE would be used. Thus, it is expected that significant adverse human health impacts would not occur as a result of using water-based compliant wood coatings which comply with PAR 1113.

A recent article by the Chemical Manufacturers Association, entitled "A Review of the Uses and Health Effects of Ethylene Glycol Monobutyl Ether"[sd](CMA, 1995) indicates that based on recent studies there is little possibility of significant adverse health effects in humans at exposure levels encountered in the typical workplace. Further, the article points out, that exposures to EGBE in consumer use would be considerably lower than the

ACGIH exposure limit of 25 ppm. The article further mentions that workers exposed to EGBE levels twice the ACGIH exposure limit, they did not experience adverse health effects. In that, it is not likely that the health index of 5.0 would be exceeded due to daily water-based compliant coating activities and these activities would occur in open, well-ventilated environments, exposures above the ACGIH exposure limit of 25 ppm are not expected. No significant adverse human health impacts resulting from the exposure of EGBE formulated coatings are expected as the result of implementing PAR 1113.

Direct Human Health Impacts for Water-based Compliant Reformulations (Flats)

IMPACT: It has been asserted by the coating industry that to meet the proposed VOC content limits of 100 g/l in 2001 and 50 g/l in 2008 for flats, manufacturers would have to use toxic coalescing solvents (i.e., glycol ethers -EGBE) in their water-based reformulations. Various articles and studies, however, indicate that this may not be the case. An article entitled "Clean Air Act Amendments" which appeared in the October 1995 edition of the Painting and Coatings Industry Magazine, indicates that current HAP solvents such as ethylene glycol ethers or ethylene glycol ether acetates will be replaced with non-HAP solvents such as propylene glycol ethers or propylene glycol ether acetates in order to comply with the 1990 CAAA. The article further states, "Coatings that meet or surpass end-user standards can be produced using low-VOC and non-HAPs-formulating technology, which enable compliance with legislation driven by the 1990 CAAA." This implies that non-HAP solvent containing coatings can be manufactured now to meet the 1990 CAAA requirements.

Recent information obtained from a draft December 1995 report entitled "Improvement of Speciation Profiles for Architectural and Industrial Coating Operations" prepared by Dr. Albert C. Censullo for CARB indicates that a majority of current water based formulations (flats and non-flats) contain non-HAP solvents. The report, which is intended to upgrade the species profiles for a number of sources within the general categories of industrial and architectural coating operations, identified that the four most common solvents in the 52 randomly chosen water-based coatings (flats and non-flats) as: Texanol (found in 37/52); propylene glycol (31/52); diethylene glycol butyl ether (23/52); and ethylene glycol (14/52). It appears from this information that the use of non-HAP solvents such as Texanol and propylene glycol in water-based coating formulations, is prevalent today and should continue in the future. Since the manufactures have almost five years to reformulate flats to meet the 100 g/l VOC content limit and twelve years to meet the 50 g/l VOC content limit, sufficient research and development time is available to formulate coatings with less hazardous or non-hazardous solvents.

The AQMD will conduct a technical assessment one year prior to each VOC content limit going into effect for lacquers and flats to determine what the state of coating technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products. If new environmental impacts are identified at that time, these issues will be addressed as required by the CEQA guidelines.

Potential adverse human health impacts could also be mitigated by the use of an optional averaging provision which should help companies comply with the proposed lower VOC limits by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales weighted average VOC content equal to that in the rule. Since current solvents would continue to be used in the higher VOC content coatings, no additional adverse human health impacts would occur.

Hazard Impacts

IMPACT: Hazard concerns are related to the risk of fire, explosions, or the release of hazardous substances in the event of an accident or upset conditions. It is expected that the 1998 VOC limits required by PAR 1113 for lacquers will be achieved, in part, through the use of acetone reformulated coatings. Acetone is flammable and may result in increased risk of flammability/explosion or accidental releases of hazardous materials. Accidental exposure to acetone, however, is not expected to cause any significant adverse hazard impacts for the reason discussed below.

Although acetone is already used in a number of compliant reformulated coatings, its use may increase because acetone was recently listed by the AQMD as an "exempt" compound due to its low level of reactivity. The increased use of acetone will generally be balanced by a decreased use of other hazardous materials such as MEK, toluene, xylene, etc. Thus, hazard impacts in the district are not expected to change significantly from existing conditions. Any anticipated increase in acetone usage may increase the number of trucks or rail cars that transport acetone within the district. The characteristics of individual trucks or rail cars that transport acetone will not be affected. A hazard consequence is directly proportional to the size of these individual trucks or rail cars and not the probability of an incident occurring. Hence, the severity of an incident involving acetone transport will not change as a result of the proposed amendments to Rule 1113. Likewise, the severity of an accident involving the storage of acetone is not expected to change from existing conditions. Emergency contingency plans that are already in place are expected to minimize potential hazard impacts. Further, businesses are required to report increases in the storage of flammable and otherwise hazardous materials to local fire departments to ensure that adequate conditions are in place to protect against hazard impacts.

In addition to the fact that compliant acetone-formulated coatings will be replacing existing coatings that may also be formulated with hazardous solvents, acetone is only expected to be used in compliant coatings until the year 2005. At that time, lacquers complying with the 275 g/l VOC content requirements are expected to be reformulated with water. Since coating manufacturers have nearly nine years to research and develop 275 g/l lacquers, it is unlikely that they will be formulated with hazardous materials compared to currently used solvents. Based upon the preceding information, hazard impacts are not expected to be significant.

AQMD staff will conduct a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products.

Potential hazard impacts could also be mitigated by the use of an optional averaging provision *for flats* which should help companies comply with the proposed lower VOC limits by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales weighted average VOC content equal to that in the rule. Since current solvents would continued to be used in the higher VOC content coatings, no additional risk of upset impacts would expected to occur.

PROJECT SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since human health and hazard impacts are not significant or speculative, no adverse impacts remain.

CUMULATIVE IMPACT: Although the proposed project is not expected to generate significant hazard impacts itself, it will contribute to a cumulatively significant impact. The reason for this conclusion is based on the fact that cumulative hazard impacts from implementing all AQMP control measures, including PAR 1113, were evaluated in the 1994 AQMP Final EIR. That analysis concluded that hazard impacts would be significant based upon the anticipated increased usage of hazardous materials (primarily anhydrous and/or aqueous ammonia). Since the cumulative analysis for PAR 1113 includes the same projects (i.e., AQMP control measures) as evaluated for the AQMP, cumulative impacts from PAR 1113 are considered to be significant.

CUMULATIVE IMPACT MITIGATION: No feasible mitigation measures have been identified to minimize the human health/hazards impacts associated with the proposed amendments while still achieving the objectives of the project.

COMPARISON OF HUMAN HEALTH/HAZARD IMPACTS FROM ALTERNATIVES

ALTERNATIVE A (NO PROJECT) SPECIFIC IMPACTS: The No Project Alternative will not change the current human health/hazard impacts. The current Rule 1113 VOC content limits would allow the continued use of coatings that contain toxics such as toluene, xylene, methyl ethyl ketone, and others. The use of those more toxic solvents may result in more significant human health impacts than would be expected from the implementation of the proposed project.

ALTERNATIVE B (NO EMISSION LIMIT CHANGES FOR LACQUERS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for lacquers. This alternative would allow the VOC content for lacquers to remain at 680 g/l. The other proposed limit changes would be maintained.

This alternative would continue the use of lacquers containing solvents such as toluene, xylene, methyl ethyl ketone, etc. As a result of the continued use of those more toxic solvents, it would be expected that more adverse human health impacts would occur under this alternative as compared to PAR 1113. This determination is made because acetone would not be used as a replacement solvent for the more toxic solvents.

For flats, it is expected that coatings manufacturers will *reformulate existing water-based formulations with lesser amounts of*~~replace higher VOC content coalescing solvents in current water-based formulations with lower VOC content~~ coalescing solvents to meet the 100 g/l VOC content limit in 2001 and the 50 g/l VOC content limit in 2008. Since it is not exactly known what these replacement solvents will be in the future it would be speculative to determine the human health impacts at this time.

ALTERNATIVE C (NO EMISSION LIMIT CHANGES FOR FLATS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for flats. This alternative would allow the VOC content for flats to remain at 250 g/l. The other proposed limit changes would be maintained.

It is expected that manufacturer's would reformulate lacquers with acetone to meet the interim 550 g/l VOC content limit in 1998. Therefore, more toxic solvents such as toluene, xylene, methyl ethyl ketone, etc. may be replaced. This alternative would result in the same human health impacts as PAR 1113.

The possible use of glycol ethers - EGBE to meet the 2005 VOC content limit of 275 g/l as mentioned above would not cause significant human health impacts. These human health impacts would be the same as the proposed project. However, since sufficient time is available for research and development of compliant coatings, it is likely that compliant coatings will be formulated with non-hazardous solvents.

ALTERNATIVE D (NO INTERIM EMISSION LIMITS FOR LACQUERS AND FLATS) SPECIFIC IMPACTS:. This alternative would remove the proposed interim limits for lacquers of 550 g/l effective January 1, 1998 and for flats of 100 g/l effective July 1, 2001. This alternative would require that only the final compliance limits of 275 g/l effective January 1, 2005 for lacquers and 50 g/l effective July 1, 2008 for flats be met. The other proposed limit changes would be maintained.

This alternative would continue the use of lacquers containing solvents such as toluene, xylene, methyl ethyl ketone, etc. As a result of the use of these more toxic solvents, it would be expected that more significant risk of upset impacts would occur as compared to PAR 1113. This determination is made because acetone would not be used as a replacement solvent for the more toxic solvents.

The possible use of glycol ethers - EGBE to meet the 2005 VOC content limit of 275 g/l as mentioned above would not cause significant adverse human health impacts. The human health impacts under this alternative would be the same as the proposed project. However, since it is not exactly known what types of solvents would be used in the future in compliant water-based wood coatings. However, since sufficient time is available for research and development of compliant coatings, it is likely that compliant coatings will be formulated with non-hazardous solvents.

For flats, it is expected that coatings manufacturers will *reformulate current water-based formulations with lesser amounts of* ~~replace higher VOC content coalescing solvents in current water based formulations with lower VOC content coalescing~~ solvents to meet 50 g/l VOC content limit in 2008. Since it is not exactly known what these replacement solvents will be in the future it would be speculative to determine the human health impacts at this time.

ALTERNATIVE E (NO EMISSION LIMIT CHANGES FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed lower VOC content limits for lacquers and flats. This alternative would allow the VOC content for lacquers and flats to remain at 680 g/l and 250 g/l, respectively. The other proposed limit changes would be maintained.

This alternative would continue the use of lacquers containing solvents such as toluene, xylene, methyl ethyl ketone, etc. As a result of the use of these more toxic solvents, it would be expected that more significant adverse human health impacts would occur under this alternative as compared to PAR 1113. This determination is made because acetone would not be used as a replacement solvent for the more toxic solvents.

Please refer to Table 3-4 at the end of the Air Quality Impact section, to see how the proposals (proposed project and project alternatives) rank next to one another. It is expected that none of these proposals would have significant human health impacts if implemented.

PUBLIC SERVICES - FIRE DEPARTMENTS IMPACTS

Significance Criteria:

The proposed project will be considered to have significant adverse impacts on fire departments if it would result in the need for new or altered fire department services.

IMPACTS: Potential adverse impacts to fire departments could occur in two ways: 1) if there is an increase in accidental release of hazardous materials used in compliant coatings, fire departments would have to respond more frequently to release incidences and 2) if there is an increase in the amount of hazardous materials stored at affected facilities, fire departments would have to conduct additional inspections.

Chemistry classes at all levels from grade school to universities, as well as industrial laboratories, use acetone for wiping down counter tops and cleaning glassware. Additional uses for acetone include solvent for paint, varnish, lacquers, inks, adhesives, heatseal coatings, and cosmetic products including nail polish and nail polish remover.

AQMD staff recently purchased a one quart container of pure acetone from a local hardware store, recommended as a special-purpose thinner, cleaner, and remover. The label, as well as the MSDS, caution the user regarding the flammability and advises the user to "keep the container away from heat, sparks, flame and all other sources of ignition. The vapors may cause flash fire or ignite explosively. Use only with adequate ventilation." All of the large coating manufacturers currently offer pure acetone for sale in quart or gallon containers with similar warnings.

Not surprisingly, containers for typical lacquer thinners also have similar warnings since their flashpoints are well below 100 degrees Fahrenheit. An evaluation of MSDSs for lacquer thinners manufactured by a number of manufacturers indicated the presence of acetone, ranging from 7% to 25% by volume. These lacquer thinners are recommended and used widely for thinning coatings, cleaning equipment, and cleaning paint spills.

AQMD staff interviewed four local fire departments to discuss the hazards associated with acetone-containing coatings. All four indicated that their department would be equally concerned with any coating or solvent which has a flashpoint below 65 degrees Fahrenheit. Currently available, several conventional nitro-cellulose lacquers generally have flashpoints well below 65 degrees Fahrenheit.

According to a letter received from Michael R. Lee, Captain of the Petroleum-Chemical Unit for the County of Los Angeles Fire Department, the Uniform Fire Code treats solvents such as acetone, butyl acetate, MEK, and xylene as Class I Flammable Liquids,

and considers them all to present the same relative degree of fire hazard. The Fire Code sets the same requirements for the storage, use and handling of all four. Captain Lee goes on to state, "In my opinion, acetone presents the highest degree of fire hazard of the four solvents considered, but not significantly more hazardous than the others. All four should be used with extreme caution, with proper safeguards in place."

The County of Los Angeles, Fire Department, Fire Prevention Guide #9 regulates spray application of flammable or combustible liquids. The guide requires no open flame, spark-producing equipment or exposed surfaces exceeding the ignition temperature of the material being sprayed within the area. For open spraying, as would be the case for the field application of the acetone-based lacquer, no spark-producing equipment or open flame shall be within 20 feet horizontally and 10 feet vertically of the spray area. Anyone not complying with the above guidelines would be in violation of current fire codes. The fire department limits residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container will be exposed to direct sunlight or heat, storage in cool water is recommended. Finally all metal containers involving the transfer of five gallons or more should be grounded and bonded.

As illustrated in Table 3-11, the flammability classifications by the National Fire Protection Association (NFPA) are the same for acetone, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol. Recognizing that acetone has the lowest flashpoint, it still has the highest Lower Explosive Limit, which means that acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm. In contrast, toluene vapors can cause an explosion at 13,000 ppm, which poses a much greater risk of explosion. The concentration of xylene vapors that could cause an explosion is even lower at 10,000 ppm. Under operating guidelines of working with flammable coatings under well ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of such vapors.

Table 3-11
Chemical Characteristics for Common Coating Solvents

Chemical Compounds	M.W.	Boiling Point (°F)	Flashpoint* (°F)	Vapor Pressure (mmHg @ 68 °F)	Lower Explosive Limit (% by Vol.)	Flammability Classification (NFPA)
Acetone	58	133	1.4	180	2.6	3
Toluene	92	231	40	22	1.3	3
Xylene	106	292	90	7	1.1	3
MEK	72	175	21	70	2.0	3
Isopropanol	60	180	53	33	2.0	3
Butyl Acetate	116	260	72	10	1.7	3
Isobutyl Alcohol	74	226	82	9	1.2	3
EGBE	118	340	141	0.6	1.1	2
EGME	76	256	107	6	2.5	2
EGEE	90	275	120	4	1.8	2
Ethylene Glycol	227	293	232	0.06		1
Texanol		471	248	0.1	0.62	1
Stoddard Solvent	144	302 - 324	140	2	0.8	2
Petroleum Distillates (Naptha)	100	314 - 387	105	40	1.0	4

In addition to the fact that acetone has an LEL comparable to some of the currently used solvents, it is only expected to be used to reformulate lacquers until the year 2005. At that time, it is expected that the 275 g/l VOC content limit will be met by reformulating with water.

As noted in the Hazard section, any increase in accidental releases of compliant coating materials would be expected to result in a concurrent reduction in the number of accidental releases of existing coating materials. Further, as demonstrated in the Human Health section, future compliant coating materials would be expected to be less hazardous and less toxic, so accidental release scenarios would be expected to pose a lower risk to responding firefighters. Further, if manufactures continue to use solvents such as EGBE in their compliant water-based coatings, fire departments would not be expected to experience adverse impacts because EGBE or glycol ethers in general are less flammable solvents and are rated by the NFPA as Class II Flammable Liquids.

AQMD staff will conduct a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any,

environmental issues are associated with the manufacture and use of such reformulated products.

PROJECT-SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since public service impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: As discussed above, the overall risk associated with the use of solvents in the district from implementing PAR 1113 and all other 1994 AQMP control measures, rules, and regulations, is not expected to appreciably change as a result of the proposed amendments and, therefore, local fire departments are not expected to require new or altered fire department services.

CUMULATIVE IMPACT MITIGATION: None required.

COMPARISON OF PUBLIC SERVICE IMPACTS FROM ALTERNATIVES

ALTERNATIVE A (NO PROJECT) SPECIFIC IMPACTS: The No Project Alternative will not change the current impacts on fire departments. The current Rule 1113 VOC content limits would allow the continued use of coatings that contain flammable solvents such as toluene, xylene, methyl ethyl ketone, and others. The use of flammable solvents would result in similar fire department impacts as would be expected from the implementation of the proposed project. The fire departments treat all Class I flammable liquids the same.

ALTERNATIVE B (NO EMISSION LIMIT CHANGES FOR LACQUERS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for lacquers. This alternative would allow the continued VOC content for lacquers to remain at 680 g/l. The other proposed limit changes would be maintained.

This alternative would allow continued the use of lacquers containing flammable solvents such as toluene, xylene, methyl ethyl ketone, etc. The use of these flammable solvents would result in similar fire department impacts as would be expected from the implementation of the proposed project. The fire departments treat all Class I flammable liquids the same.

For flats, it is expected that coatings manufacturers will *reformualte current water-based formulations with lesser amounts of* ~~replace higher VOC content coalescing solvents in current water based formulations with lower VOC c~~ coalescing solvents to meet the 100 g/l VOC content limit in 2001 and the 50 g/l VOC content limit in 2008. If

manufacturers continue to use solvents such as EGBE in their compliant water-based coatings, fire department impacts are not expected because EGBE or glycol ethers in general are less flammable solvents and are rated by the NFPA as Class 2 Flammable Liquids.

ALTERNATIVE C (NO EMISSION LIMIT CHANGES FOR FLATS) SPECIFIC IMPACTS: This alternative would omit the proposed lower VOC content limits for flats. This alternative would allow the continued VOC content for flats to remain at 250 g/l. The other proposed limit changes would be maintained.

It is anticipated that with this alternative lacquers would be reformulated with acetone to meet the 550 g/l interim VOC content limit. Even though acetone has a higher vapor pressure, flashpoint, and LEL than other solvents such as toluene, xylene, methyl ethyl ketone, etc. it is expected that fire department impacts would not increase under this alternative. Under operating guidelines for working with flammable coatings under well ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of acetone vapors such that a fire would result.

At this time, it is not certain what type of solvents will be used to meet future VOC content limits for lacquers. However, if manufacturers continue to use solvents such as EGBE in their compliant water-based coatings, fire department impacts are not expected because EGBE or glycol ethers in general are less flammable solvents and are rated by the NFPA as Class 2 Flammable Liquids.

ALTERNATIVE D (NO INTERIM EMISSION LIMITS FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed interim limits for lacquers of 550 g/l effective January 1, 1998 and for flats of 100 g/l effective July 1, 2001. This alternative would require that only the final compliance limits of 275 g/l effective January 1, 2005 for lacquers and 50 g/l effective July 1, 2008 for flats be met. The other proposed limit changes would be maintained.

This alternative would continue the use of lacquers containing flammable solvents such as toluene, xylene, methyl ethyl ketone, etc. The use of these flammable solvents would result in similar fire department impacts as would be expected from the implementation of the proposed project. The fire departments treat all Class 3 flammable liquids the same.

At this time, it is not certain what type of solvents will be used to meet future VOC content limits for lacquers. However, if manufacturers continue to use solvents such as EGBE in their compliant water-based coatings, fire department impacts are not expected because EGBE or glycol ethers in general are less flammable solvents and are rated by the NFPA as Class 2 Flammable Liquids.

ALTERNATIVE E (NO EMISSION LIMIT CHANGES FOR LACQUERS AND FLATS) SPECIFIC IMPACTS: This alternative would remove the proposed lower

VOC content limits for lacquers and flats. This alternative would allow the continued VOC content for lacquers and flats to remain at 680 g/l and 250 g/l, respectively. The other proposed limit changes would be maintained.

This alternative would continue the use of lacquers containing flammable solvents such as toluene, xylene, methyl ethyl ketone, etc. The use of these flammable solvents would result in similar fire department impacts as would be expected from the implementation of the proposed project. The fire departments treat all Class 3 flammable liquids the same.

Please refer to Table 3-4 at the end of the Air Quality Impact section, to see how the proposals (proposed project and project alternatives) rank next to one another. It is expected that none of these proposals would have significant fire department impacts if implemented.

CHAPTER 4

ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

Environmental Impacts Found Not To Be Significant
Other CEQA Topics

ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

An Environmental Checklist (Appendix D) was prepared for the proposed rule, describing anticipated environmental impacts resulting from implementing Proposed Amended Rule 1113.

Implementation of the proposed amendments is not expected to change existing business conditions within the district. It will not increase or decrease the number or type of businesses and consumers using architectural coatings. Therefore, AQMD staff has determined that there will be no significant impacts to the following environmental resources in the district:

Land Use and Planning

Implementation of the proposed amendments will not cause significant adverse impacts to land uses or land use planning in the district. It is anticipated that any increased activities will occur at existing facilities. Thus, no new resources or facilities are expected to be constructed which would result in any land use impacts.

No new development or alterations to existing land use designations will occur as a result of the implementation of the proposed amendments. It is not anticipated that existing land uses located in the district would require additional land to continue current operations or require rezoning. Therefore, no significant adverse impacts affecting existing or future land uses are expected.

Population and Housing

The proposed amendments will primarily affect the formulation of architectural coatings and are not anticipated to generate any significant effects, either direct or indirect on the district's population as no additional workers are anticipated to be required to comply with the proposed amendments. Further, PAR 1113 is not expected to cause a relocation of population within the district. As a result, housing in the district is expected to be unaffected by the proposed amendments. New housing construction is not expected to be affected by the use of lower-VOC coatings. Coating performance and durability issues are discussed relative to potential indirect air quality impacts in Chapter 3 - Air Quality Impacts.

Geophysical

Architectural coatings are applied to buildings, stationary structures, roads, etc. The proposed amendments affect coating formulators and have no effects on geophysical formations in the district. Therefore, PAR 1113 is not expected to result in additional

exposure of people to potential impacts involving seismicity, landslides, mudslides or erosion as no new development is anticipated.

Transportation/Circulation

The proposed amendments will not substantially increase the amount of businesses or equipment in the district. The main effect of the proposed amendments will be to alter the way certain architectural coatings are manufactured. No additional vehicle trips are anticipated as a result of the transportation of acetone-based or water-based coatings. Potential hazard associated with the transportation of acetone is discussed in the Hazard section. As discussed in Risk of Upset/Hazards acetone is associated with significantly fewer vehicular accidents and other incidents than paint and paint thinner. Therefore, potential increases in traffic or alterations of traffic patterns are not anticipated as a result of implementing the proposed amendments.

Biological Resources

Implementation of the proposed amendments will not cause impacts to sensitive habitats of plants or animals because all activities will occur at construction, industrial or commercial sites already in operation. No new development that could potentially adversely impact plant and animal life is anticipated. Potential impacts to aquatic life from releases of excess paint and associated wastewater disposed of in sewer and storm drains is discussed in Chapter 3 - Water Quality Impacts section.

Energy and Mineral Resources

The proposed amendments will not substantially increase the number of businesses or amount of equipment in the district. Therefore, no increases in energy consumption or mineral resources are expected. Consequently, energy impacts are not considered to be significant.

Noise

No significant noise impacts are associated with the use of architectural coatings. Coating formulators within the district potentially affected by the proposed amendments are located in existing construction industrial, or commercial areas. It is assumed that these facilities are subject to and in compliance with existing community noise standards. In addition to noise generated by current operations, noise sources in each area include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses.

In general, the primary noise source at existing facilities is generated by vehicular traffic, such as trucks transporting raw materials to the facility, trucks hauling wastes away from the facility, trucks to recycle waste or other materials, and miscellaneous noise such as spray equipment (i.e. compressors, spray nozzles) and heavy equipment use (forklifts, trucks, etc.). Noise is generated during operating hours, which generally range from 6 a.m. to 5 p.m. Monday through Friday. PAR 1113 is not expected to alter noise from existing noise generating sources.

It is likely that affected companies are operating in compliance with any local noise regulations that may exist in their respective communities. Therefore, no significant noise impacts are expected from the proposed amendments.

Utilities and Service Systems

The proposed amendments will not substantially increase the amount of businesses or equipment in the district. Reformulation of coatings is not expected to require additional utility or service systems. In fact, PAR 1113 may actually result in fewer impacts to utilities and/or public service agencies because compliant coatings are expected to be formulated with less hazardous materials compared to current coatings. Demands on utilities or utility systems are not expected to increase and impacts to utilities are therefore, not considered to be significant.

Aesthetics

No major changes to existing facilities or stockpiling of additional materials or products outside of existing facilities are expected to result. Therefore, no significant impacts adversely affecting existing visual resources such as scenic views or vistas, etc., are anticipated to occur. Coating performance and durability issues are discussed relative to potential indirect air quality impacts in Chapter 3 - Air Quality Impacts and are not expected to have direct aesthetic impacts.

Cultural Resources

The proposed amendments are expected to affect wood furniture coatings used at existing facilities; no new development or other activities that could potentially affect archaeological, historical, or cultural resources were identified.

Recreation

The proposed amendments will not generate additional demand for, or otherwise affect land used for recreational purposes. Further, as already explained, the proposed amendments are

not expected to have adverse affects on land uses in general. No significant adverse effects on recreational facilities were identified. One comment received on the NOP indicated that recreation may be affected because demand for parks would increase due to increased job losses and unemployed workers. Implementation of PAR 1113 is not expected to result in any significant job losses and therefore, this is not a realistic adverse impact. The district staff prepared a Socioeconomic Assessment which addresses cost and associated employment impacts associated with adoption and implementation of PAR 1113.

Economic Impacts

Detailed analyses of economic or social effects are necessary only when they have significant impacts on physical environmental parameters. *The proposed amendments to Rule 1113 would lower the VOC content limits for some coating categories and temporarily increase the VOC content limits for other coating categories. Other components of the proposed amendments include addition of and modification to some definitions, updating the analytical test methods, establishing an averaging methodology for flats by which compliance with future VOC content limits can be demonstrated, and conducting a technical assessment one year prior to each of the effective dates for VOC content limits.* ~~The proposed amendments are only intended to provide short-term relief to local wood coating firms by temporarily delaying draft compliance dates for some categories of wood furniture coatings. This may provide an economic benefit to local businesses.~~ As a result *implementing*, no significant adverse direct or indirect (secondary) environmental impacts resulting from economic impacts have been identified. There are no environmental impacts which can be traced from socioeconomic effects. A socioeconomic analysis *has* ~~is~~, nevertheless, *been* being prepared. The socioeconomic impact report for *PAR* Rule 1113 *is* will be included in the *Final* ~~Draft~~ Staff Report. Persons interested in obtaining copies of the *Final* Draft Staff Report should contact the district Public Information Center at (909) 396-3600.

OTHER CEQA TOPICS

The following sections address various topics and issues required by CEQA such as growth inducement, short-term versus long-term effects, and irreversible changes.

Relationship Between Short-Term Uses And Long-Term Productivity

Adopting the proposed amendments is not expected to result in various short- and/or long-term effects. The proposed amendments will not substantially affect the number of architectural coating businesses or equipment in the AQMD. As already indicated, PAR 1113 will not contribute to significant adverse cumulative air quality impacts.

Irreversible Environmental Changes

The proposed amendments would not generate any additional or greater irreversible environmental impacts than may be occurring currently with the usage of architectural coatings.

Potential Growth-Inducing Impacts

Implementing PAR 1113 will not, by itself, have any direct or indirect growth-inducing impacts on businesses in the AQMD's jurisdiction because it is not expected to foster economic or population growth or the construction of additional housing and primarily affects existing coating formulation companies.