

*MOJAVE DESERT*  
AIR QUALITY MANAGEMENT DISTRICT



# Post 1996 Attainment Demonstration and Reasonable Further Progress Plan

San Bernardino County Portion of the Southeast Desert AQMA

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15428 CIVIC DRIVE, VICTORVILLE, CALIFORNIA 92392  
PHONE (619) 245-1661  
FAX (619) 245-2699

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## EXECUTIVE SUMMARY

The 1990 Federal Clean Air Act Amendments (FCAA) require areas designated nonattainment for the federal ozone standard to comply with federal attainment planning requirements. These requirements are based on the severity of the area's ozone nonattainment classification. The ozone classifications range from Marginal to Extreme depending on their ozone design value. A portion of the District has been classified Severe-17, and must comply with all the attainment planning requirements for areas classified Severe. The Severe-17 classification requires the District to attain the federal ozone standard by November 15, 2007.

Federal ozone nonattainment areas are required to demonstrate Reasonable Further Progress (RFP) and Attainment of the federal ozone standard by their applicable attainment date. The 1990 FCAA includes two provisions for demonstrating RFP and attainment. The first provision requires ozone nonattainment areas to develop a control strategy plan, which provides for a 15 percent reduction in 1990 Volatile Organic Compounds (VOC) emission levels by November 15, 1996. The District met this requirement with the adoption of the Rate-Of-Progress Plan (ROP) in March 1993. The California Air Resources Board (ARB) has submitted the ROP to the United States Environmental Protection Agency (USEPA) as a State Implementation Plan (SIP) revision.

The other provision requires ozone nonattainment areas to develop a control strategy plan which provides for a 3 percent per year reduction in 1990 VOC emission levels, averaged over consecutive 3 year periods. Additionally, the control strategy plan must demonstrate attainment of the federal ozone standard by the applicable attainment date. This control strategy plan must be submitted to the USEPA as a SIP revision by November 15, 1994.

The RFP and attainment demonstration planning requirements use a 1990 base year emission inventory to measure required emission reductions. The RFP emission reductions are measured every 3 years at designated milestone years beginning in 1996. The attainment demonstration is based on a photochemical grid model which models the effects of the RFP emission reductions on future ambient ozone concentrations. The attainment demonstration is validated when the photochemical grid model shows that the ambient ozone concentrations in the required attainment year do not exceed 0.12 part per million (ppm).

USEPA classified the Southeast Desert Modified Air Quality Maintenance Area (AQMA) as Severe-17 based on a 0.24 ppm ozone design value measured in Banning, California. This ozone nonattainment area covers the Coachella Valley/San Jacinto region in Riverside County, the Victor Valley/Barstow region in San Bernardino County, and the Antelope Valley region in Los Angeles County. All of these areas are located within the Southeast Desert Air Basin (SEDAB). USEPA considers the Severe-17 classification as one ozone nonattainment area, and requires all three sub-regions collectively to attain the federal ozone standard by the year 2007.

The 1990 FCAA RFP and attainment demonstration requirements do not consider the effects of transported ambient ozone concentrations on recorded federal ozone violations in the AQMA. The federal attainment planning requirements are based on a one-for-one reduction between ozone precursor emissions (VOC and NO<sub>x</sub>) and monitored ambient ozone concentrations. Because USEPA considers the AQMA as one ozone nonattainment area, all violations of the federal ozone standard in the Coachella Valley/San Jacinto region and Antelope Valley region have a direct affect on the District's federal ozone nonattainment status.

This control strategy plan shows that the District is overwhelmingly impacted by ozone transported from the South Coast Air Basin (SCAB), and that it's attainment demonstration is dependant on SCAB's attainment of the federal ozone standard. The plan also shows that the District has exhausted all feasible control measures to demonstrate progress towards attainment of the federal ozone standard. Most importantly, the plan shows that the District will attain the 0.12 ppm federal ozone standard in the year 2007, by SCAB substantially reducing it's ozone precursor emissions (VOC and NO<sub>x</sub>) to reduce the effects of transported ozone on the District's monitored ozone concentrations.

Although the emissions generated in SCAB overwhelmingly contribute to the District's ozone violations, the District's control measures will have no effect on reducing these emissions. The District's control measures will also have no effect on reducing emissions in the Coachella/San Jacinto and Antelope Valley regions. Additionally, the District's control measures will have no effect on reducing biogenic emissions, which far exceed those emitted by anthropogenic sources. All of these factors, in addition to the District's diverse meteorological and geographical conditions, make the District's attainment planning and control efforts an exercise in futility in attaining the federal ozone standard.

## **PART 1**

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# **GENERAL INFORMATION AND BACKGROUND**

## **CHAPTER 1**

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### **INTRODUCTION**

**Purpose**

**Statement of Problem**

**Document Outline**

## **INTRODUCTION**

### **Purpose**

Pursuant to the 1990 Amendments to the Federal Clean Air Act (FCAA), the United States Environmental Protection Agency (USEPA) redesignated the Southeast Desert Modified Air Quality Maintenance Area (AQMA) as a nonattainment area for the federal ozone standard, and classified it Severe-17. This AQMA covers the Antelope Valley region in Los Angeles County, the Victor Valley/Barstow region in San Bernardino County, and the Coachella Valley/San Jacinto region in Riverside County. All of these areas are located within the Southeast Desert Air Basin (SEDAB). The outlying desert areas of San Bernardino and Riverside Counties are designated unclassified/attainment for the federal ozone standard.

The Mojave Desert Air Quality Management District (District) is the local planning agency responsible for the San Bernardino County portion of SEDAB and the Palo Verde Valley in Riverside County. The southwest portion of the District's boundaries is located within the AQMA. As a result of the AQMA's Severe-17 classification, the District is required to demonstrate Reasonable Further Progress (RFP) and Attainment of the federal ozone standard in the year 2007.

The purpose of this document is to set forth a comprehensive program that will lead the District into compliance with the federal ozone standard. This document is designed to satisfy the 1990 FCAA RFP and attainment demonstration requirements for federal ozone nonattainment areas. It includes a 1990 emission inventory for Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NO<sub>x</sub>); Forecasted VOC and NO<sub>x</sub> emission inventories for future years 1999, 2002, 2005 and 2007; Target level VOC and NO<sub>x</sub> emissions for future years 1999, 2002, 2005 and 2007; Specific Control Measures and Contingency Measures; Federal Conformity Emission Budgets; and Urban Airshed Model (UAM) results.

### **Statement of Problem**

ARB used a 0.24 parts per million (ppm) ozone air measurement recorded in Banning, California as the design value to classify the AQMA as a Severe-17 ozone nonattainment area. The District believes that the air pollution sources located in the San Bernardino County portion of the AQMA did not contribute to the Banning, California ozone air measurement. First of all, the District's 1990 VOC and NO<sub>x</sub> emission levels (ozone precursor emission) are not representative of other areas, which violate the federal ozone standard. Secondly, the District's geographical and meteorological conditions prevent the transport of ozone precursor emissions into Banning, California. Most importantly, federal ozone violations in Banning, California are overwhelmingly influenced by ambient ozone concentrations transported from SCAB. Due to these factors, the District believes that any reduction of ozone precursor emissions in the District will not affect the monitored ambient ozone concentrations in Banning, California.

Nonetheless, the Severe-17 classification requires the District to demonstrate progress towards attainment of the federal ozone standard by reducing its 1990 VOC emission levels by at least 3 percent per year. Additionally, this classification requires the District to demonstrate attainment of the federal ozone standard by using a photochemical grid model. The purpose of this model is to determine the effects of the District's VOC emission levels, and control measures on predicted ambient ozone concentrations in the AQMA.

The District's 1990 VOC emission levels provide little opportunity to achieve the required emission reductions to meet the 1990 FCAA RFP requirements. This issue is exacerbated by the projected growth in the District, because the RFP emission reductions are required to account for all future growth in emissions above the 1990 levels. Additionally, there is strong evidence that high ambient ozone concentrations are transported from SCAB into the District. The District believes that these transported ozone concentrations are the primary cause of the District's federal ozone violations.

### **Document Outline**

This document provides a narrative discussion addressing specific topics. Part 1 of the document provides general information and background. This part includes Chapter 2 which provides a description of the ozone nonattainment area. Part 2 addresses the RFP requirements. This part includes Chapter 3 which provides details on the VOC and NO<sub>x</sub> emission inventories; Chapter 4 which provides details on required emission reductions; and Chapter 5 which provides details on control measures; and Chapter 6 which provides details on contingency measures. Part 3 of the document addresses the attainment demonstration requirements. This part includes Chapter 7 which provides discussion on the UAM. Part 4 of the document addresses federal conformity requirements. This part includes Chapter 8 which provides information on general development and transportation emission budgets. Part 5 of the document addresses the technical support documentation. This part includes appendices that contain information and data to substantiate the narrative.

## **CHAPTER 2**

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### **BACKGROUND**

**Legal Requirements**

**Ozone Properties**

**Area Description**

## **BACKGROUND**

### **Legal Requirements**

The 1990 FCAA requires ozone nonattainment areas to submit a State Implementation Plan (SIP) revision, which demonstrates RFP. This SIP revision is required to describe how the ozone nonattainment area will achieve actual VOC emission reductions of at least 3 percent per year averaged over each consecutive 3-year period. These emission reductions requirements begin on November 15, 1996 until the ozone nonattainment area attains the federal ozone standard. This SIP revision must also describe how any growth in emissions over the 1990 VOC emission levels will be reduced (Section 182(c)(2)).

In addition to these RFP requirements, the SIP revision must include a demonstration that the plan will provide for attainment of the federal ozone standard by the applicable attainment date. This attainment demonstration must be based on photochemical grid modeling, or an equivalent analytical method as determined by USEPA (Section 182(c)(2)).

### **Ozone Properties**

Ozone (O<sub>3</sub>) is a colorless gas with a sharp odor. It has three atoms of oxygen per molecule. High ozone concentrations exist naturally far above the earth's surface in the stratosphere. Some mixing of stratospheric ozone downward to the earth's surface does occur. However, ozone concentrations are normally very low at the earth's surface in sites remote from urban surfaces. Ozone forms in presence of sunlight due to a complex series of chemical reactions between hydrocarbons and NO<sub>x</sub>. Resultant ozone concentrations may be many times the background levels encountered in remote areas.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and can cause health problems. Ozone causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection. Recent studies have shown that even relatively low ozone concentrations can significantly reduce lung function in normal healthy people when exercising. Animal studies show repeated exposure to ozone over periods of months to years can cause permanent damage to lungs and accelerate loss of lung function and aging.

### **Area Description**

The Severe-17 ozone nonattainment area covers the southwest portion of the District. It does not cover the Palo Verde Valley in Riverside County. The federal ozone nonattainment area includes a population of approximately 295,463 persons. Its boundaries encompass 7,440 square miles and is bordered by: (1) the SCAB boundary and the Riverside County Line to the south; (2) the Los Angeles and Kern County lines to the west; (3) latitude 35° 10' N to the north; and (4) longitude 115° 45' W to the east (See Map I).

The climate is characteristic of a desert environment. The intervening mountain ranges block cool, moist coastal air and create hot, dry summers and cool winters. Meteorology is influenced by a moderately intense anticyclonic circulation, except during periods of frontal activity during the winter. On average, 20-30 frontal systems (ie. storms) move into the District each winter. During the summer, the District is generally influenced by a Pacific Subtropical High cell that sits off the coast of California.

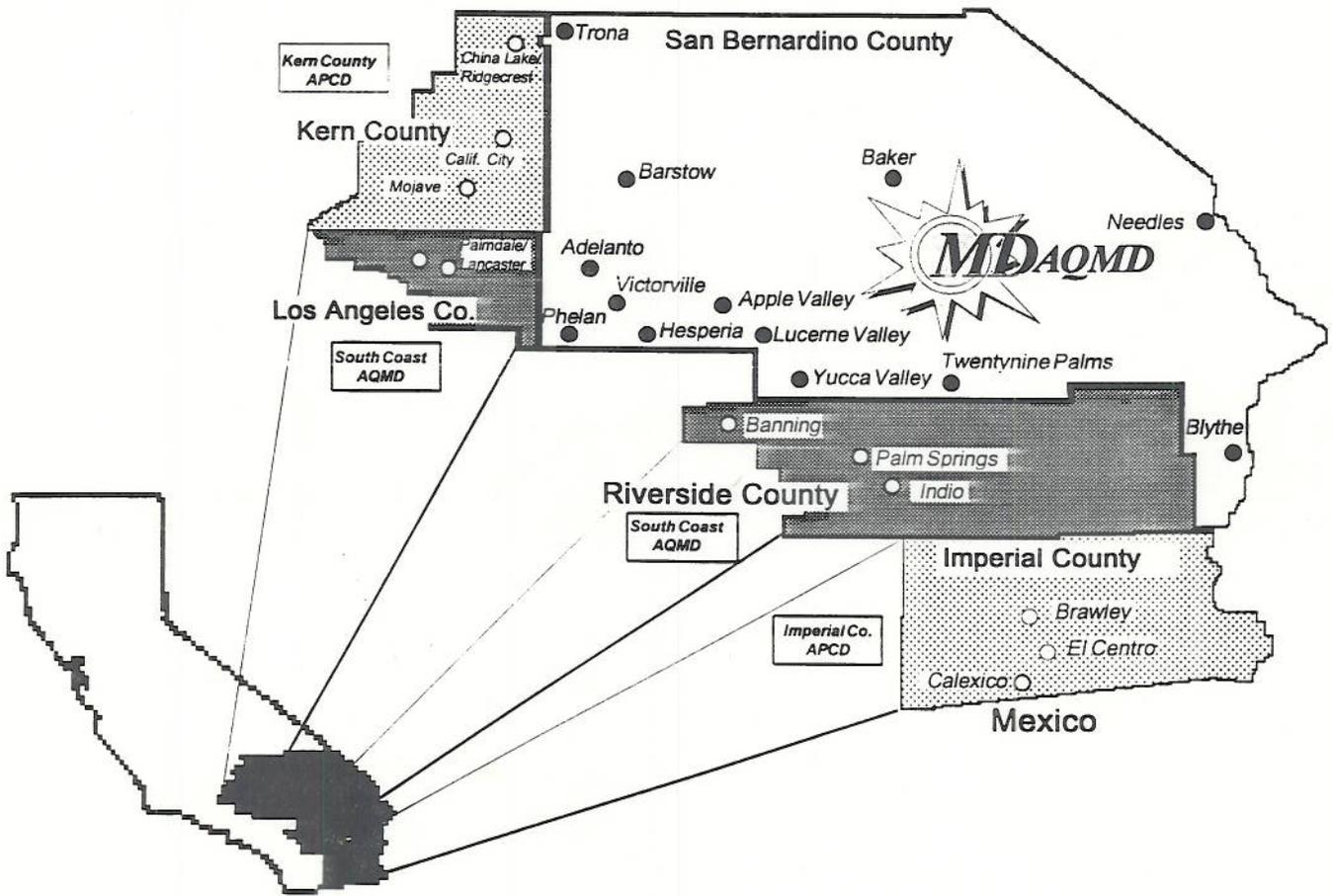
The District experiences high prevailing winds primarily from the south and west. These prevailing southwest winds provide a vehicle for a visible smog wall transported from SCAB through mountain passes. In addition, the rapid daytime heating of the lower air leads to convective activity. This exchange of upper air tends to accelerate surface winds during the warm part of the day when convection is at a minimum. During the winter the rapid cooling of the surface layers at night retards this exchange of momentum, which often results in calm winds.

The District's inversion conditions are much less favorable for the build-up of high pollutant concentrations than in the coastal areas of Southern California. When subsidence inversions occur they are generally 6,000 to 8,000 feet above the desert surface, allowing much greater vertical mixing than along the coast where the inversion base is often much lower.

# Map I

## Severe-17 Ozone Nonattainment Area Boundaries

### SOUTHEAST DESERT AIR BASIN



map not to scale

## **PART 2**

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**Post 1996 Reasonable Further Progress**

## **CHAPTER 3**

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### **EMISSION INVENTORIES**

**Base Year Emissions**

**Future Year Emissions**

## **EMISSION INVENTORIES**

This section summarizes VOC and NO<sub>x</sub> emissions occurring in the base year, and emissions predicted to occur in future years. These inventory years are selected to comply with the 1990 FCAA RFP requirements. In order to determine the level of required emission reductions and to propose effective control measures, it is necessary first to identify the sources of pollution and to quantify the type and amount of emissions they contribute.

The 1990 FCAA requires each ozone nonattainment area to submit a comprehensive planning inventory of actual emissions from all sources. The planning inventory includes a base year inventory and future year inventories. Emissions occurring in the year 1990 are considered the base year emission levels. Emission occurring in the years 1999, 2002, 2005, and 2007 are considered future year emission levels.

### **Base Year Emissions**

The District has prepared a 1990 Base Year Emission Inventory for VOC and NO<sub>x</sub>. This inventory identifies all anthropogenic stationary, mobile and area sources in ozone nonattainment area. It quantifies actual emission levels generated by these sources in the year 1990 (Refer to Appendix A - Emission Inventory for additional details).

The 1990 Baseline Emission Inventory includes biogenic emissions (emissions not caused by mankind). Although biogenic emissions contribute to the actual amount of pollutants emitted in the federal ozone nonattainment area, these emissions are excluded from the 1990 base year emission levels for RFP purposes. For informational purposes only, 1990 biogenic VOC emission levels totalled 117.79 tons per day (tpd). Anthropogenic VOC emission levels only totalled 46.50 tpd in 1990.

Table 3-1 shows a summary of the 1990 Base Year Emission Inventory. As can be seen, On-Road Mobile sources were the largest contributor of VOC emissions, and Stationary Point sources were the largest contributor of NO<sub>x</sub> emissions in the base year.

**Table 3-1**  
**1990 Base Year Emission Inventory**

<b>Source Category</b>	<b>VOC tpd</b>	<b>NO<sub>x</sub> tpd</b>
Stationary Point Sources	5.58	51.05
Stationary Area Sources	11.38	0.45
On-Road Mobile Sources	23.60	30.25
Off-Road Mobile Sources	2.93	31.71
Miscellaneous Area Sources	2.99	0.17
	46.50	113.65

Notes: Emission based on average ozone seasonal day (June through August)

### Future Year Emissions

The District has prepared future year emission inventories for VOC and NO<sub>x</sub>. These inventories predict emission levels for the years 1999, 2002, 2005, and 2007. These inventories are forecasted from the 1990 base year emission levels using various emission growth factors (refer to Appendix A - Emission Inventory for additional details).

Table 3-2 shows a summary of the future year VOC and NO<sub>x</sub> emission levels. As can be seen, future year VOC and NO<sub>x</sub> emission levels are predicted to grow through the year 2007.

**Table 3-2**  
**Future Year Emission Levels**

<b>Future Year</b>	<b>VOC tpd</b>	<b>NO<sub>x</sub> tpd</b>
1999	45.19	109.72
2002	49.07	110.74
2005	53.96	112.76
2007	57.27	114.07

Note: 1996 emissions levels are included in the Rate-of-Progress Plan.

## **CHAPTER 4**

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### **RFP CALCULATIONS**

**Target Year Emissions**

**Required Emission Reductions**

## RFP CALCULATIONS

This section summarizes the required emission reductions to meet the 1990 FCAA RFP requirements. The District is required to reduce its 1990 VOC emission levels by 3 percent per year, averaged over consecutive 3 year periods. The 1990 FCAA planning requirements assume that reducing the precursors to ozone formation (VOC and NO<sub>x</sub>) will reduce ambient ozone concentrations to attainment levels.

The General Preamble for Title I prescribes the methodology for calculating the required emission reductions to meet the RFP requirement. This methodology establishes the target emission levels for each milestone year (eg. years 1999, 2002, 2005, and 2007). The District is required to achieve these emission levels in each milestone year to show progress towards attainment of the federal ozone standard.

### Target Year Emissions

The District has calculated the VOC target emission levels for each milestone year. These targets are determined by adding the calculated 3 percent annual emission reductions from the 1990 adjusted base year emission levels to the calculated emission reductions from the Federal Motor Vehicle Control Program (FMVCP) and Federal Reid Vapor Pressure (FRVP) regulations, subtracted from the adjusted base year (Refer to Appendix B - Control Measures for additional details).

The District will use NO<sub>x</sub> reductions, in addition to VOC reductions, to meet the VOC target emission levels. Therefore, the District is required to establish NO<sub>x</sub> target emission levels to determine available NO<sub>x</sub> reductions for substitution. These NO<sub>x</sub> target emission levels are calculated similar to the VOC target emission levels.

Table 4-1 shows the VOC target emission levels in each milestone year. As can be seen, the VOC target emission levels are substantially lower than the future year emission levels. Therefore, the District is required to reduce each milestone year VOC emission levels to meet these targets.

**Table 4-1**  
**VOC Emission Reductions**

<b>Year</b>	<b>Future VOC tpd</b>	<b>Target VOC tpd</b>	<b>Required Red. tpd</b>
1999	45.19	32.25	12.94
2002	49.07	28.15	20.92
2005	53.96	24.02	29.94
2007	57.27	21.26	36.01

Table 4-2 shows the NO<sub>x</sub> target emission levels in each milestone year. As can be seen, the District's NO<sub>x</sub> target emission levels are higher than the future year emission levels for the 1999 to 2005 milestone years. However, the future year emission level for 2007 is lower than the 2007 NO<sub>x</sub> target emission level. The District is required to reduce it's 2007 NO<sub>x</sub> emission level to meet this target.

**Table 4-2**  
**NO<sub>x</sub> Emission Reductions**

Year	Future NO <sub>x</sub> tpd	Target NO <sub>x</sub> tpd	Required Red. tpd
1999	109.72	115.50	0
2002	110.74	114.32	0
2005	112.76	113.06	0
2007	114.07	112.24	1.83

**Required Emission Reductions**

The required emission reduction is the difference between the future year emission levels and target year emission levels. For example, the 1999 VOC future year emissions total 45.19 tpd and the 1999 VOC target year emissions total 32.25 tpd. The District is required to achieve a 12.94 tpd reduction in 1999 to demonstrate RFP.

Table 4-1 shows the required VOC emission reductions for each milestone year. As can be seen, the District is required to reduce it's 1990 VOC emission levels by approximately 22 percent in 1996; 31 percent in 1999; 39 percent in 2002; 48 percent in 2005; and 54 percent in 2007. All proposed VOC control efforts are aimed at achieving these target emission levels.

Table 4-2 shows the required NO<sub>x</sub> emission reductions for each milestone year. As can be seen, the District is only required to reduce it's 2007 NO<sub>x</sub> emission level to meet the 2007 NO<sub>x</sub> target level. Chapter 5 includes NO<sub>x</sub> control efforts to achieve the 2007 NO<sub>x</sub> target emission level.

## **CHAPTER 5**

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### **CONTROL MEASURES**

**Control Strategies**

**RFP Emission Reductions**

**NO<sub>x</sub> Substitution**

**RFP Strategy**

**Rule Adoption Schedule**

## CONTROL MEASURES

This section discusses proposed control measures to achieve the required emission reductions discussed in Chapter 4. The District has identified control measures that can achieve actual emission reductions in each milestone year. The District has also identified various state and federal programs that can achieve additional emission reductions to achieve these goals. Almost all of these and SCAB's control measures were included in the UAM to demonstrate attainment of the federal ozone standard (See Chapter 7).

### Control Strategies

The 1990 FCAA requires federal ozone nonattainment areas to achieve VOC reductions to meet the RFP requirement. The RFP provision allows for NO<sub>x</sub> control, in addition to VOC control, as long as the total emission reductions improve ozone concentrations equivalent to required VOC reductions (Section 182(c)(2)(C)).

The District has opted to use NO<sub>x</sub> reductions, in addition to VOC reductions, to demonstrate RFP. Table 5-1 and 5-2 show the proposed VOC and NO<sub>x</sub> control measures. This table briefly describes the source category, control measure and enforcement agency (Refer to Appendix B - Control Measures for additional details).

**Table 5-1  
Proposed VOC Control Measures**

<u>Category</u>	<u>Measure</u>	<u>Description</u>	<u>Agency</u>
<b>Stationary Sources</b>			
Gasoline Dispensing	Rule 461	Require VOC reductions from gasoline dispensing facilities.	MDAQMD
Architectural Coatings	Rule 1113	Establish VOC limits for architectural coatings.	MDAQMD
Natural Gas Utilities	Rule 1160	Require VOC reductions from IC engines.	MDAQMD
Cutback Emulsified Asphalt	Rule 1103	Establish VOC limits on asphalt applications.	MDAQMD
<b>Mobile Sources</b>			
On-Road Vehicle Exhaust Standards	State Program	Establish manufacturer VOC emission standards.	ARB
Off-Road Heavy Duty Equipment	State Program	Establish manufacturer VOC emission standards.	ARB
Light Duty Industrial Equipment Standards	State Program	Establish manufacturer VOC emission standards.	ARB
Lawn and Garden Equipment Standards	State Program	Establish manufacturer VOC emission standards.	ARB
Off-Road Recreational Vehicle Standards	State Program	Establish manufacturer VOC emission standards.	ARB
Aircraft	State Program	Establish manufacturer VOC emission standards.	ARB
Recreational Gasoline Boat Standards	State Program	Establish manufacturer VOC emission standards.	ARB
<b>Miscellaneous Sources</b>			
Pesticides	State Program	Establish formulation and use restrictions.	ARB
Consumer Products	State Program	Establish manufacturer VOC emission standards.	ARB

**Table 5-2  
Proposed NO<sub>x</sub> Control Measures**

<b>Category</b>	<b>Measure</b>	<b>Description</b>	<b>Agency</b>
<b>Stationary Sources</b>			
Boilers and Process Heaters	Rule 1157	Require NO <sub>x</sub> reductions from boilers and process heaters.	MDAQMD
Electric Power Generation	Rule 1158	Require NO <sub>x</sub> reductions from electric utility equipment.	MDAQMD
Gas Turbines	Rule 1159	Require NO <sub>x</sub> reductions from gas fired turbines.	MDAQMD
Natural Gas Utilities	Rule 1160	Require NO <sub>x</sub> reductions from IC engines.	MDAQMD
<b>Mobile Sources</b>			
On-Road Vehicle Exhaust Standards	State Program	Establish manufacturer NO <sub>x</sub> emission limits.	ARB
Off-Road Heavy Duty Equipment Standards	State Program	Establish manufacturer NO <sub>x</sub> emission limits.	ARB
Lawn and Garden Equipment Exhaust Standards	State Program	Establish manufacturer NO <sub>x</sub> emission limits.	ARB
Light Duty Industrial Equipment Standards	State Program	Establish manufacturer NO <sub>x</sub> emission limits.	ARB
Locomotive Standards	State Program	Establish locomotive NO <sub>x</sub> emission limits.	ARB

## RFP Emission Reductions

The following is a summary of the expected emission reductions from the proposed VOC and NO<sub>x</sub> control measures. These emission reductions are directed at achieving the target year emission levels discussed in Chapter 4.

Table 5-3 shows expected VOC emission reductions in each milestone year. As can be seen, the District's VOC reduction shortfall substantially increases between the 1999 and 2007 milestone years. The District will have to make-up these VOC reduction shortfalls with available NO<sub>x</sub> reductions.

**Table 5-3**  
**VOC Control Measures Emission Reductions**  
**(Without NO<sub>x</sub> Substitution)**

<b>Year</b>	<b>Future VOC tpd</b>	<b>Target VOC tpd</b>	<b>Required VOC Red.</b>	<b>Controls VOC Red.</b>	<b>VOC Red. Shortfall</b>
1999	45.19	32.25	12.94	7.92	5.02
2002	49.07	28.15	20.92	9.43	11.49
2005	53.96	24.02	29.94	11.96	17.98
2007	57.27	21.26	36.01	13.47	22.54

## NO<sub>x</sub> Substitution

USEPA guidance requires NO<sub>x</sub> to be substituted at the same ratio as the 1990 adjusted base year emission levels (116.95 tpd of NO<sub>x</sub> to 42.75 tpd of VOC). This equates to 2.74 tpd NO<sub>x</sub> reduction for each tpd of VOC reduction. Table 5-4 shows the expected NO<sub>x</sub> emission reductions for each milestone year. As can be seen, available NO<sub>x</sub> reductions are substituted approximately at a 2.74 to 1 ratio.

**Table 5-4**  
**NO<sub>x</sub> Control Measures Emission Reductions**

<b>Year</b>	<b>Future NO<sub>x</sub> tpd</b>	<b>Target NO<sub>x</sub> tpd</b>	<b>Required NO<sub>x</sub> Red.</b>	<b>Controls NO<sub>x</sub> Red.</b>	<b>NO<sub>x</sub> Red. Substitute</b>
1999	109.72	115.50	0	15.77	5.93
2002	110.74	114.32	0	21.94	8.12
2005	112.76	113.06	0	29.47	10.90
2007	114.07	112.24	1.83	33.66	12.12

Note: Available NO<sub>x</sub> substitution is calculated using USEPA guidance.

## RFP Strategy

Because the District's attainment demonstration is dependant on SCAB's control measures reducing ozone transport to attain the federal ozone standard, the District is taking credit for SCAB's VOC and NO<sub>x</sub> emission reductions to make-up the District's emission reduction shortfall. SCAB's UAM attainment demonstration requires SCAB to achieve additional emission reductions to attain the federal ozone standard. These additional reductions were also included in the District's UAM attainment demonstration to show attainment in the year 2007. As an upwind District, SCAB's emission reductions show progress towards attainment of the federal ozone standard in the District.

Table 5-5 shows the total emission reductions in each milestone year. As can be seen, the District's available NO<sub>x</sub> substitution do not make-up the entire VOC reduction shortfall. Even with the use of available NO<sub>x</sub> reductions, the District will not achieve the VOC target emission levels for the 2002 to 2007 milestone years.

**Table 5-5  
Emission Reduction Shortfall**

<b>Year</b>	<b>VOC Reductions</b>	<b>NO<sub>x</sub> Substitute</b>	<b>Required Reductions</b>	<b>Emission Shortfall</b>
1999	7.92 tpd	5.83 tpd	12.94 tpd	0.00 tpd
2002	9.43 tpd	8.12 tpd	20.92 tpd	3.37 tpd
2005	11.96 tpd	10.90 tpd	29.94 tpd	7.08 tpd
2007	13.47 tpd	12.12 tpd	36.01 tpd	10.42 tpd

### Rule Adoption Schedule

The following is a summary of the District's rule adoption schedule. As can be seen, the District has adopted the majority of the rules to implement the control measures. The commits to adopt and submit the remaining rules as SIP revisions no later than November 15, 1994.

**Table 5-6  
District Rules**

<b>District Rules</b>	<b>Adoption</b>
Rule 461 (Gasoline Dispensing)	5/25/94
Rule 1103 (Cutback Emulsified Asphalt)	10/26/94
Rule 1113 (Architectural Coatings)	11/2/92
Rule 1157 (Boilers and Process Heaters)	10/26/94
Rule 1158 (Electric Power Generation)	3/22/95
Rule 1159 (Gas Turbines)	3/22/95
Rule 1160 (Internal Combustion Engines)	10/26/94

## **CHAPTER 6**

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### **CONTINGENCY MEASURES**

#### **Contingency Emission Reductions**

## CONTINGENCY MEASURES

This section discusses proposed contingency measures that will take effect in the event that the control measures discussed in Chapter 5 fall short of achieving the required emission reductions. Contingency measures are required to achieve at least a 3% tpd reduction from the 1990 VOC emission levels (57 Federal Register 13498 published April 16, 1992). This equates to a 1.3 tpd VOC reduction.

Table 6-1 shows the proposed contingency measure. This table briefly describes the source category, contingency measure and enforcement agency (Refer to Appendix B - Control Measures for additional details).

**Table 6-1**  
**Proposed Contingency Control Measures**

<u>Category</u>	<u>Measure</u>	<u>Description</u>	<u>Agency</u>
On-Road Motor Vehicles	State Program	Enhanced Inspection and Maintenance (Compliance with Tailpipe Emission)	ARB

### Contingency Emission Reductions

The proposed State Enhanced I&M and the Federal Enhanced I&M programs are currently centered in legal controversy, as well as technical controversy. The District proposes the State's version of Enhanced I&M as a contingency measure. Table 6-2 shows the expected emission reductions from the proposed contingency measure in future years. As can be seen, Enhanced I&M provides more than enough VOC reductions to meet the contingency measure requirement.

**Table 6-2**  
**Contingency Measure Emission Reductions**

<u>Year</u>	<u>Controls VOC Red.</u>	<u>Required VOC Red.</u>
1999	1.36 tpd	1.30 tpd
2002	1.34 tpd	1.30 tpd
2005	1.41 tpd	1.30 tpd
2007	1.45 tpd	1.30 tpd

## **PART 3**

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# **ATTAINMENT DEMONSTRATION REQUIREMENTS**

## **CHAPTER 7**

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### **ATTAINMENT DEMONSTRATION**

**Model Domain**

**Model Inputs**

**Modeling Episodes**

**Urban Airshed Model**

## **ATTAINMENT DEMONSTRATION**

This section discusses the Attainment Demonstration requirement. The 1990 FCAA requires ozone nonattainment areas to use a photochemical grid model to demonstrate attainment of the federal ozone standard. The model used to project future ambient ozone concentrations is the UAM with the Carbon Bond IV mechanism. The model evaluates emissions, meteorology, and geography to predict future ozone concentrations. The UAM determines the effectiveness of the proposed control measures on ambient ozone concentrations during the attainment year 2007. It is the model recommended by USEPA and ARB for these purposes.

Due to technical problems directly relating to overwhelming transport (i.e., model boundary conditions), USEPA and ARB recommended that the South Coast Air Quality Management District (SCAQMD) perform the attainment demonstration for the District using a model with a larger modeling domain (refer to SCAQMD AQMP Appendix V-A and Technical Report V-A and V-B). The District is also overwhelmed by transport from the San Joaquin Valley, but no UAM exists that includes both SCAB and the San Joaquin Valley in its model domain.

### **Model Domain**

The UAM attainment demonstration performed by SCAQMD included the majority of the AQMA within its model domain, along with all of SCAB and Ventura County (See Figure 7-1). If the District modeled just the AQMA, excessive boundary conditions would have rendered the UAM results invalid. The larger model domain benefits the District's attainment demonstration, because the upwind domain includes all sources within SCAB.

### **Model Inputs**

SCAQMD performed the UAM attainment demonstration using data maintained by ARB and MDAQMD. The District supplied SCAQMD with an emission inventory maintained by ARB. The emission inventory used for the UAM closely approximates the emission inventory presented in Chapter 3. The UAM also used ARB emission growth codes to estimate future emission levels. These growth estimates are, in general, higher than the growth estimates used in this plan. The UAM attainment demonstration was performed using District control measures as proposed in December 1993. These control measures represent a close approximation to the proposed District Rules, state programs and FIP measures presented in Chapter 5.

SCAQMD also used the emission inventories and control measures for SCAB, the Antelope Valley region in Los Angeles County, and the Coachella/San Jacinto Valley region in Riverside County for the UAM.

## Modeling Episodes

SCAQMD used five meteorological episodes to perform the air quality analyses. Table 7-1 shows these meteorological episodes and their corresponding hourly ozone concentration maxima. As can be seen, the District experienced violations of the federal ozone standard on the same dates as SCAB's recorded violations. SCAB's violations doubled and tripled the 0.12 ppm federal ozone standard on these dates. In comparison, the District's highest exceedance was 0.4 ppm higher than the 0.12 ppm federal ozone standard. The District believes that these exceedances were primarily caused by ozone transport from SCAB on those violation dates.

**Table 7-1**  
**Peak Concentration (pphm)**

<u>Episode</u>	<u>SCAB</u>	<u>Mojave Desert</u>
June 5-7, 1985	36	15
August 26-28, 1987	29	13
June 23-25, 1987	24	14
July 13-15, 1987	25	12
September 7-9, 1987	33	12

## Urban Airshed Model

For each episode, the UAM predicted maximum hourly ozone concentrations for the year 2007 with and without implementation of the District's proposed control measures (as presented in Chapter 5), and the SCAB's control measures (as presented in the SCAQMD 1994 AQMP) for each of the five meteorological episodes. Table 7-2 presents the hourly ozone concentration maxima for each episode in the attainment year of 2007 with and without these control measures. Using the emission reductions from the proposed control measures, including SCAB's emission reductions, the UAM predicts the AQMA to be in attainment of the federal ozone standard in the year 2007.

Table 7-2 shows SCAB's and the District's predicted ozone concentrations in the attainment year 2007. As can be seen, the District's attainment demonstration is dependant on SCAB's attainment of the 0.12 ppm federal ozone standard in the attainment year 2007.

**Table 7-2**  
**2007 Attainment Year Ozone Concentrations**

<b>Episode</b>	<b>SCAB Uncontrolled</b>	<b>SCAB Controlled<sup>1</sup></b>	<b>MDAQMD Uncontrolled</b>	<b>MDAQMD Controlled<sup>2</sup></b>
June 5-7, 1985	19	15	12	8
August 26-28, 1987	17	14	12	6
June 23-25, 1987	15	13	12	9
July 13-15, 1987	13	11	10	9
September 7-9, 1987	15	11	12	9

1 - Controlled with SCAQMP Control Measures

2 - Controlled with ADP Control Measures



## **PART 4**

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# **FEDERAL CONFORMITY REQUIREMENTS**

## **CHAPTER 8**

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### **CONFORMITY EMISSION BUDGETS**

**General Development**

**Transportation**

## CONFORMITY EMISSION BUDGETS

This section discusses the federal conformity emission budgets. The emission budgets establish the basis for making conformity determinations for federally funded and/or approved projects, plans, or programs in the Severe-17 ozone nonattainment area.

Emission budgets are intended to ensure that emissions generated by proposed projects, plans, or programs will not inhibit the District's ability to achieve the required emission reductions to demonstrate RFP and/or attainment.

### General Development

USEPA has not released guidance for establishing General Development emission budgets. This document will not include an emission budget for General Development plans, programs, or projects. The District will revise this document to include General Development emission budgets when USEPA guidance is available.

### Transportation

The District did not include behavior-based mobile source control measures to demonstrate RFP. The District does not expect to achieve any additional emission reductions beyond those from State and federal programs accounted for in the future year emission levels. On-road mobile source emissions should not exceed the following emission budgets to ensure conformity with this document. Table 8-1 and 8-2 show the Transportation VOC and NO<sub>x</sub> emission budgets. These budgets were calculated by subtracting the emission reductions generated by ARB on-road mobile source control program from the on-road mobile source emission inventory forecast. The on-road mobile source emission inventory forecast was determined using SCAG vehicular activity data from the DTIM system as input to the ARB BURDEN/EMFAC7f model. Refer to Appendix A for more details.

**Table 8-1**  
**Transportation VOC Emission Budget**

VOCs	1999 tpd	2002 tpd	2005 tpd	2007 tpd
On-Road Mobile Sources	12.21	12.18	12.84	13.26
ADP Control Measures (Reductions)	0.89	1.12	1.42	1.87
On-Road Mobile Source VOC Emission Budget:	11.32	11.06	11.42	11.39

**Table 8-2**  
**Transportation NO<sub>x</sub> Emission Budget**

<b>NO<sub>x</sub></b>	<b>1999 tpd</b>	<b>2002 tpd</b>	<b>2005 tpd</b>	<b>2007 tpd</b>
On-Road Mobile Sources	24.49	24.32	24.98	25.40
ADP Control Measures (Reductions)	1.46	2.50	5.11	7.74
<b>On-Road Mobile Source NO<sub>x</sub> Emission Budget:</b>	<b>23.03</b>	<b>21.82</b>	<b>19.87</b>	<b>17.66</b>

## **PART 5**

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## **APPENDICES**

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**APPENDIX A**

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**EMISSION INVENTORY**

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# VOC, NO<sub>x</sub> and CO Emission Inventory

## I. INTRODUCTION

This document presents the Emission Inventory for the 2007 Attainment Demonstration Plan, covering the Mojave Desert Air Quality Management District's Federal ozone nonattainment area (San Bernardino County portion of the Southeast Desert Modified Air Quality Management Area). This inventory serves as the basis for the planning assumptions, forecasts and strategies presented in the ADP. The inventory tabulates volatile organic compound (VOC), oxides of nitrogen (NO<sub>x</sub>), and carbon monoxide (CO) emissions from all anthropogenic sources within the District federal ozone nonattainment area. CO emissions are not involved in the ozone planning process, and are included for informational purposes only. Emissions are estimated for a typical day during the 1990 ozone season (June through August). Attachment A contains a summary of the emission inventory.

## II. PRESENTATION FORMAT

Sources are presented in four groups: stationary point sources, stationary area sources, mobile sources, and miscellaneous area sources. Within each group, sources are organized by industry or activity type as categories. VOC, NO<sub>x</sub> and CO emissions are totalled for each category in tons per ozone seasonal day, tons per average annual day, and tons per year. Standard Industrial Classification (SIC) codes, Source Classification Codes (SCCs), and Emission Inventory Code (EIC) numbers are given for each category when known. These codes and numbers identify industry, activity and process, and may not accurately represent each facility. The emission data is presented individually in tabular format with category totals. Additional information is presented that discusses emissions data sources and emissions data calculation methods.

### III. EMISSION SOURCE GROUPS

#### a. STATIONARY POINT SOURCES

For the purposes of this document, Stationary Point Sources are typically large-scale, fixed facilities or operations with significant District-permitted equipment. Each District facility submits an annual criteria emission inventory that details emissions, activity rates and emission factors. These criteria emission inventory submissions were the primary data and methodology used for point sources.

##### Category: Chemical Milling - Etching

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.04	0.02	0.00	(tons per ozone seasonal day)
	0.04	0.02	0.00	(tons per average annual day)
	15.60	9.00	1.20	(tons per year)

SIC 3728 (Aircraft Parts and Auxiliary Equipment)  
Primary SCC 3-09-015-01 (Milling Tank)

Chemical Milling - Etching is composed of a single facility:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
Aerochem/El Mirage			
Storage Tank	5.64	0.00	0.00
Maskant Coater	9.78	0.00	0.00
Two Natural Gas Boilers	0.18	9.00	1.20
Category Totals (tons per year):	15.60	9.00	1.20

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors. Activity levels were provided by facilities.

##### Category: Flat Glass Manufacturing

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.01	2.16	0.03	(tons per ozone seasonal day)
	0.01	2.16	0.03	(tons per average annual day)
	3.83	786.98	10.13	(tons per year)

SIC 3211 (Flat Glass Manufacturing)  
Primary SCC 3-05-014-03 (Flat Glass Melting Furnace)

Flat Glass Manufacturing is composed of a single facility:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>AFG/Victorville</b>			
Natural Gas Furnace	3.31	784.25	9.54
Diesel IC Engine	0.09	1.65	0.36
Diesel Vehicles	0.06	1.08	0.23
Coating Fugitives	0.37	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>3.83</b>	<b>786.98</b>	<b>10.13</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using furnace source tests and emission factors for other sources. Activity levels were provided by AFG.

**Category: Concrete Batch and Asphalt Plants**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.04	0.01	(tons per ozone seasonal day)
	0.00	0.04	0.01	(tons per average annual day)
	0.94	15.29	4.81	(tons per year)

SIC 1422 (Crushed and Broken Limestone)  
 SIC 2951 (Asphalt Paving Mixtures and Blocks)  
 SIC 3273 (Ready-Mixed Concrete)

Concrete Batch and Asphalt Plants is composed of the following five facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Agcon/Oro Grande</b>			
Diesel Mobile Equipment	0.15	2.81	0.61
<b>Boral Resources, Inc./Several Facilities</b>			
Two Asphalt Plants	0.07	1.99	0.40
Two Asphalt Storage Tanks	0.01	0.28	0.07
Screening Plant	0.01	0.15	0.03
Three Internal Combustion Engines	0.34	4.80	0.51
Three Front End Loaders	0.22	3.55	0.82
<b>Industrial Asphalt/Oro Grande</b>			
Natural Gas Asphalt Plant	0.10	1.40	2.30
<b>Victor Valley Ready Mix/Hesperia</b>			
Diesel Mobile Equipment	0.02	0.31	0.07
<b>Wilde Horse/Barstow</b>			
Aggregate Circuit	0.02	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>0.94</b>	<b>15.29</b>	<b>4.81</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using equipment-specific emission factors. Activity levels were provided by facilities.

**Category: General Aviation**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.07	0.02	4.08	(tons per ozone seasonal day)
	0.07	0.02	4.08	(tons per average annual day)
	27.31	5.98	1490.97	(tons per year)

**SIC 4581 (Airports, Flying Fields, and Airport Terminal Services)**

General Aviation is composed of four facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
Apple Valley Airport/Apple Valley Single and Multiple Piston Aircraft	8.86	1.87	486.77
Barstow-Daggett Airport/Daggett	8.86	1.87	486.77
Hesperia Airport/Hesperia	8.86	1.87	486.77
Twentynine Palms Airport/Twentynine Palms	0.73	0.37	30.66
<b>Category Totals (tons per year):</b>	<b>27.31</b>	<b>5.98</b>	<b>1490.97</b>

Emission information was obtained from the Apple Valley Airport Improvements Draft Environmental Impact Report (P&D Technologies, February 1992) and does not represent all general aviation activity District-wide (additional information will be added as it becomes available); in addition, aircraft refueling operations emissions information will be added as information becomes available. Emissions were estimated using EPA aircraft emission factors. Aircraft activity levels were derived from historical Apple Valley Airport activity records.

**Category: Railroad Depot**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.05	0.03	0.10	(tons per ozone seasonal day)
	0.05	0.03	0.10	(tons per average annual day)
	17.07	10.41	37.90	(tons per year)

**SIC 4013 (Railroad Switching)**

Railroad Depot is composed of a single facility:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
Atchison, Topeka & Santa Fe/Barstow Wastewater Treatment	0.32	0.00	0.00

Diesel Test Stand	0.10	7.80	3.50
Two Gasoline Storage Tanks	0.01	0.00	0.00
Eight Diesel Storage Tanks	3.69	0.00	0.00
Three Waste Oil Storage Tanks	0.92	0.00	0.00
Gasoline Mobile Equipment	3.05	1.28	33.54
Diesel Mobile Equipment	0.16	1.33	0.86
Coater	2.88	0.00	0.00
Toluene Storage Tank	0.96	0.00	0.00
Fiberglass	4.98	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>17.07</b>	<b>10.41</b>	<b>37.90</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors. Activity levels were provided by the facility.

**Category: Public Wastewater Treatment Plants**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.11	0.02	(tons per ozone seasonal day)
	0.00	0.11	0.02	(tons per average annual day)
	0.60	39.47	8.79	(tons per year)

**SIC 4952 (Sewerage Systems)**

Public Wastewater Treatment Plants is composed of the following two facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Barstow Wastewater Treatment Plant/Barstow</b>			
Natural Gas IC Engine	0.19	37.90	4.79
Two Emergency Generators	0.00	0.18	0.02
Sewage Sludge Incinerator	0.01	0.13	0.17
Diesel Incinerator	0.00	0.02	0.00
Natural Gas Space Heating	0.00	0.04	0.01
Cleaning/Degreasing Fugitives	0.12	0.00	0.00
<b>Victor Valley Wastewater Reclamation Authority/Victorville</b>			
Digester Gas Flare	0.02	0.18	0.59
Digester Gas and Natural Gas IC Engine	0.09	1.02	3.21
Primary and Secondary Wastewater Treatment	0.18	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>0.60</b>	<b>39.47</b>	<b>8.79</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using equipment-specific emission factors. Activity levels were provided by facilities.

**Category: Mineral Mining**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.03	0.38	0.21	(tons per ozone seasonal day)
	0.03	0.38	0.21	(tons per average annual day)
	11.19	137.44	74.88	(tons per year)

- SIC 1099 (Metal Ore Mining)
- SIC 1422 (Crushed and Broken Limestone Mining)
- SIC 1453 (Fire Clay Mining)
- SIC 1499 (Miscellaneous Non-metallic Mineral Mining)
- SIC 3295 (Ground or Treated Minerals Manufacturing)

Mineral Mining is composed of the following 10 facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Brubaker-Mann/Barstow</b>			
Diesel IC Engine	0.28	5.32	1.16
<b>CalWest Rock/Newberry Springs</b>			
Diesel Mobile Equipment	1.32	25.35	5.51
Gasoline Mobile Equipment	0.59	0.42	16.13
<b>Crystal Hills Sand &amp; Gravel/Lucerne Valley</b>			
Diesel Mobile Equipment	0.54	0.01	2.25
<b>Partin Limestone/Lucerne Valley</b>			
Four Diesel IC Engines	0.33	6.44	1.40
Diesel Mobile Equipment	0.90	17.36	3.77
Gasoline Mobile Equipment	0.30	0.21	8.22
<b>Pluess-Stauffer/Lucerne Valley</b>			
Natural Gas/Oil Heater	0.00	0.16	0.04
Oil Heater	0.00	0.16	0.04
Heat Exchanger	0.00	0.10	0.02
Two IC Engine Generator Sets	0.04	1.47	0.28
Non-retail Gasoline Dispensing	0.02	0.00	0.00
Diesel Vehicles	0.30	1.71	1.49
Gasoline Vehicles	0.10	0.11	0.58
Coating Fugitives	0.61	0.00	0.00
Lubricant Fugitives	0.84	0.00	0.00
<b>Rheox Plant/Newberry Springs</b>			
Natural Gas Dryer	0.02	2.67	0.72
Natural Gas Boiler	0.05	2.97	0.80
Diesel IC Engine	0.05	0.64	0.14
Propane IC Engine	0.06	0.10	0.09
Gasoline IC Engine	0.02	0.01	0.31

<b>Rheox Mine/Hector</b>			
Blasting	0.00	0.84	3.30
Gasoline IC Engine	0.13	0.06	2.45
Diesel IC Engine	1.68	21.04	4.58
<b>Sierra Aggregate/Lucerne Valley</b>			
Two Diesel IC Engines	0.45	8.65	1.88
<b>Specialty Minerals/Lucerne Valley</b>			
Dry Sizer Burner	0.01	1.44	0.36
IC Engine Genset	0.00	0.01	0.00
Diesel Storage Tank	0.08	0.00	0.00
Gasoline Storage Tank	0.01	0.00	0.00
Mobile Equipment	2.19	36.70	16.02
<b>Victorville Industrial Minerals/Oro Grande</b>			
Diesel Mobile Equipment	0.18	3.42	0.74
Gasoline Mobile Equipment	0.09	0.07	2.60
<b>Category Totals (tons per year):</b>	<b>11.19</b>	<b>137.44</b>	<b>74.88</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors. Activity levels were provided by individual facilities.

**Category: Petroleum Terminals**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.08	0.00	0.00	(tons per ozone seasonal day)
	0.08	0.00	0.00	(tons per average annual day)
	30.11	0.00	0.00	(tons per year)

**SIC 5171 (Petroleum Bulk Stations and Terminals)**

Petroleum Terminals is composed of three facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>CalNev Pipeline/Barstow Class A Terminal</b>			
Fourteen Storage Tanks	17.04	0.00	0.00
Two Loadout Racks	5.19	0.00	0.00
Three Transmix Pumps	0.49	0.00	0.00
Gasoline Pump	1.13	0.00	0.00
Diesel Pump	0.23	0.00	0.00
Liquid Valve Fugitives (216 valves)	0.10	0.00	0.00
Vapor Valve Fugitives (14 valves)	0.18	0.00	0.00
Vapor Compressor	0.21	0.00	0.00
Relief Valve Fugitives	0.32	0.00	0.00
Degreaser Fugitives	0.42	0.00	0.00

<b>CalNev Pipeline GAFB/Victorville</b>			
Three JP-4 Storage Tanks	3.57	0.00	0.00
Four Pumps	0.64	0.00	0.00
Liquid Valve Fugitives	0.02	0.00	0.00
<b>Victorville Oil/Victorville</b>			
Storage Tanks	0.33	0.00	0.00
Loadout Rack	0.23	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>30.11</b>	<b>0.00</b>	<b>0.00</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors. Activity levels were provided by facilities.

**Category: Electric Utility and Electricity Generation Facilities**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	1.12	4.41	2.50	(tons per ozone seasonal day)
	1.12	4.41	2.50	(tons per average annual day)
	408.91	1608.66	911.59	(tons per year)

SIC 4911 (Electric Services)

SCC 2-01-002-01 (Natural Gas Turbine Generator)

SCC 1-03-006-01 (Industrial Natural Gas Boiler 10-100 mmbtu/hr)

Electric Utilities and Generators is composed of five facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Daggett Leasing/Daggett (SEGS I &amp; II)</b>			
Natural Gas Boiler	0.37	6.68	6.66
Super Heater	0.02	2.37	0.81
Three Heaters	0.08	0.96	0.19
Diesel IC Engines	0.09	1.30	0.23
Ullage	0.00	0.14	0.03
Caloria Fugitives	2.50	0.00	0.00
Therminol Fugitives	3.92	0.00	0.00
Gasoline Vehicles	0.02	0.05	0.15
Diesel Vehicles	0.03	0.16	0.07
Non-retail Gasoline Dispensing	0.07	0.00	0.00
<b>Harper Lake/Harper Lake (SEGS VIII &amp; IX)</b>			
Two Natural Gas Boilers	0.80	9.33	9.15
Diesel IC Engines	0.03	0.42	0.07
Therminol Fugitives	16.62	0.00	0.00
Gasoline Vehicles	0.03	0.06	0.21

Diesel Vehicles	0.03	0.15	0.07
Non-retail Gasoline Dispensing	0.03	0.00	0.00
<b>Kramer Junction/Kramer Junction (SEGS III - VII)</b>			
Five Natural Gas Boilers	0.49	58.45	26.89
Five Auxiliary Heaters	0.05	2.99	2.44
Nine IC Engines	0.14	3.24	0.57
Therminol Fugitives	19.58	0.00	0.00
Gasoline Vehicles	0.05	0.13	0.44
Diesel Vehicles	0.01	0.74	0.34
Non-retail Gasoline Dispensing	0.13	0.00	0.00
<b>Southern California Edison, Coolwater/Daggett</b>			
Two Natural Gas Boilers	14.23	181.62	24.17
Two Combined Cycle Turbines	347.47	1319.57	834.17
Storage Tanks	1.28	0.00	0.00
<b>U.S. West/Oro Grande</b>			
Two Natural Gas Boilers	0.84	20.30	5.00
<b>Category Totals (tons per year):</b>	<b>408.91</b>	<b>1608.66</b>	<b>911.59</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using source test results and emission factors. Activity levels were provided by facilities.

**Category: Military Bases**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	1.90	2.49	8.20	(tons per ozone seasonal day)
	1.90	2.49	8.20	(tons per average annual day)
	692.61	909.55	2991.85	(tons per year)

SIC 9711 (National Security Administration)

Military Bases is composed of five facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Edwards Air Force Base</b>			
Four Rocket Test Stands	0.00	0.60	17.50
<b>George Air Force Base/Victorville</b>			
Hospital Incinerator	0.01	0.01	0.00
Fire Fighting Practice Pit	14.18	0.18	24.81
Heating, Cooling and Power	6.77	127.39	25.51
Aircraft Corrosion Control	10.76	0.00	0.00
Base Paint Shops	4.38	0.00	0.00
Aerospace Ground Equipment	10.08	128.60	63.47

Bulk Fuel Storage	6.59	0.00	0.00
Fueling Operations	109.40	0.00	0.00
Aircraft Flying Operations	113.32	166.84	539.89
Aircraft Ground Operations	1.60	3.59	7.11
Civilian Ground Vehicles	56.85	37.64	323.71
Military Ground Vehicles	8.14	12.50	59.67
<b>USMC AGCC/Twenty-nine Palms</b>			
Three Boilers (NG/Diesel)	0.32	13.77	2.78
16 Diesel Water Heaters	0.00	0.06	0.01
Natural Gas Boilers	0.00	0.31	0.07
ETO Sterilizers	0.01	0.00	0.00
Diesel Generator	0.01	0.14	0.03
Two Nonretail Gasoline Dispensing	2.93	0.00	0.00
Six Coating Operations	0.29	0.00	0.00
23 Diesel Generators	0.16	2.90	0.68
Natural Gas Space Heaters	0.07	3.15	0.63
Natural Gas Water Heaters	0.04	2.07	0.41
Miscellaneous Propane	0.00	0.02	0.01
Diesel Base Vehicles	1.57	30.10	6.55
Gasoline Base Vehicles	20.70	14.78	570.79
Private Gasoline Vehicles	2.60	5.50	34.20
Diesel Tactical Vehicles	0.93	17.88	3.89
Fugitive Coatings	4.94	0.00	0.00
Military Fixed-Wing Aircraft	146.33	114.40	531.84
Military Rotary-Wing Aircraft	33.56	54.24	110.89
<b>USMC Logistics Base Nebo Annex/Barstow</b>			
Twelve Boilers	3.04	19.17	1.27
Twenty IC Engines	0.11	73.23	23.63
Gasoline Dispensing	0.86	0.00	0.00
Spray Booths	20.15	0.00	0.00
Dip Tanks	0.08	0.00	0.00
JP-5 Tanks	0.02	0.00	0.00
Diesel Vehicles	0.07	0.05	2.21
Antifreeze Fugitives	0.54	0.00	0.00
Gasoline Vehicles	5.01	2.41	92.99
<b>USMC Logistics Base/Yermo</b>			
Five Natural Gas Boilers	0.60	11.65	0.22
Degreasers	32.27	0.00	0.00
Seven Diesel IC Engines	6.05	31.45	447.08
Nine Spray Booths	59.42	0.00	0.00
Stenciling	0.81	0.00	0.00
Dip Tanks	0.39	0.00	0.00

Diesel Test Stand	0.38	17.32	3.77
JP-5 Test Stands	0.02	0.29	0.06
Six IC Engine Test Stands	0.97	13.95	3.04
Two IC Engine Compressors	0.06	0.66	0.14
Solvent Still Fugitives	0.36	0.00	0.00
Gasoline Vehicles	4.86	2.41	92.99
<b>Category Totals (tons per year):</b>	<b>692.61</b>	<b>909.55</b>	<b>2991.85</b>

The 1990 George Air Force Base (GAFB) inventory was taken directly from Air Force report describing 1989 through 1992 GAFB emissions ("Air Emissions Inventory Report for George Air Force Base," Galson Corporation 1/94). Other emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors with actual activity levels; activity levels were substantiated using signed records.

**Category: Medical Facilities**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.02	0.07	0.01	(tons per ozone seasonal day)
	0.02	0.07	0.01	(tons per average annual day)
	8.69	26.56	3.63	(tons per year)

**SIC 8062 (General Medical and Surgical Hospitals)**

Medical Facilities is composed of three facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Hi-Desert Medical Center/Joshua Tree</b>			
Incinerator	0.00	0.13	0.00
Natural Gas Space Heating	0.01	0.43	0.09
Coating Fugitives	1.41	0.00	0.00
<b>Saint Mary Desert Valley Hospital/Apple Valley</b>			
Two Natural Gas Boilers	0.10	4.59	0.92
Diesel Generator	0.01	0.11	0.02
Formaldehyde Fugitives	0.16	0.00	0.00
<b>Victor Valley Community Hospital/Victorville</b>			
Two Boilers	0.06	3.00	0.40
Two IC Engines	0.05	0.63	0.14
Cogeneration	6.89	17.67	2.06
<b>Category Totals (tons per year):</b>	<b>8.69</b>	<b>26.56</b>	<b>3.63</b>

Emission information was obtained from criteria emission inventory submissions, and does not represent all medical facilities, others will be added as information becomes available. Emissions were estimated using equipment-specific emission factors. Activity levels were

provided by facilities.

**Category: Crematoria**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.00	0.00	(tons per ozone seasonal day)
	0.00	0.00	0.00	(tons per average annual day)
	0.10	0.00	0.00	(tons per year)

SIC 7261 (Funeral Service and Crematories)

Crematoria is composed of two facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
Memorial Conservatory/Joshua Tree Crematorium	0.02	0.00	0.00
Victor Valley Memorial Park/Victorville Crematorium	0.08	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>0.10</b>	<b>0.00</b>	<b>0.00</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using equipment-specific emission factors. Activity levels were provided by facilities.

**Category: Miscellaneous Coating Operations**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.02	0.01	0.00	(tons per ozone seasonal day)
	0.02	0.01	0.00	(tons per average annual day)
	8.90	3.28	0.79	(tons per year)

- SIC 2711 (Newspapers: Publishing)
- SIC 4899 (Miscellaneous Communications Services)
- SIC 3499 (Miscellaneous Metal Product Fabrication)
- SIC 3479 (Miscellaneous Metal Coating)
- SIC 3272 (Concrete Products)
- SIC 3291 (Abrasive Products)

Six facilities comprise Miscellaneous Coating Operations:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
Daily Press/Victorville Printing	1.62	0.00	0.00

<b>Lockheed/Helendale</b>			
Four IC Engines	0.00	0.22	0.05
Non-retail Gasoline Dispensing	0.02	0.00	0.00
Spray Booths	0.23	0.00	0.00
Coatings	0.24	0.00	0.00
<b>Ludlow Engineering/Hesperia</b>			
Coating	0.07	0.00	0.00
<b>McWelco/Hesperia</b>			
Coating	1.52	0.00	0.00
<b>Northwest Pipe &amp; Casing/Adelanto</b>			
Natural Gas Boiler	0.00	0.03	0.01
Taping	4.01	0.00	0.00
Diesel Mobile Equipment	0.16	3.03	0.73
<b>Tepco/Phelan</b>			
Prep Line	0.18	0.00	0.00
Unitized	0.23	0.00	0.00
Cleanup	0.62	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>8.90</b>	<b>3.28</b>	<b>0.79</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using coating-specific emission factors. Activity levels were provided by facilities.

**Category: Composite Fabric (Fiberglass) Operations**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.01	0.00	0.00	(tons per ozone seasonal day)
	0.01	0.00	0.00	(tons per average annual day)
	4.00	0.00	0.00	(tons per year)

SIC 3088 (Plastics Plumbing Fixtures)

One facility makes up Composite Fabric (Fiberglass) Operations:

Facility Name/Location	VOC	NO <sub>x</sub>
Pacific Tank/Oro Grande Fiberglass	4.00	0.00
<b>Category Totals (tons per year):</b>	<b>4.00</b>	<b>0.00</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using operation-specific emission factors. Activity levels were provided by facilities.

**Category: Cement Manufacturing**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.65	26.80	5.97	(tons per ozone seasonal day)
	0.65	26.80	5.97	(tons per average annual day)
	236.19	9782.93	2177.62	(tons per year)

SIC 3241 (Hydraulic Cement Manufacturing)

Primary SCC 3-05-006-06 (Cement Manufacturing Dry Process Kiln)

Four Facilities make up Cement Manufacturing:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Mitsubishi Cement/Lucerne Valley</b>			
Coal-Fired Kiln	32.02	2514.96	437.15
Two Diesel IC Engine Comps	0.32	6.03	1.31
Three Diesel IC Engine Drills	0.46	8.91	1.94
Gasoline Vehicles	0.02	0.86	5.86
Diesel Vehicles	0.06	2.29	1.55
Diesel Equipment and Rail	0.45	34.08	7.92
Space Heating Fugitives	0.02	0.99	0.20
<b>Riverside Cement/Oro Grande</b>			
Seven Coal-Fired Cement Kilns	111.72	3292.13	138.37
Seven Natural Gas Kiln Preheaters	0.03	32.77	2.33
Gasoline Storage Tank	0.05	0.00	0.00
Solvents/Coatings Fugitives	4.40	0.00	0.00
Vehicle Exhaust	3.79	2.71	104.62
Heavy Equipment Exhaust	4.52	86.82	18.88
Miscellaneous Equipment Exhaust	0.39	18.70	3.74
<b>Southwest Portland Cement Quarry/Apple Valley</b>			
Two Coal-Fired Cement Kilns	68.15	3642.76	1352.55
Raw Mill	0.01	0.24	0.05
Non-Retail Gasoline Transfer	0.05	0.00	0.00
Mobile Diesel Equipment	4.99	95.82	20.84
Mobile Gasoline Equipment	1.95	1.39	53.75
Mobile LPG Equipment	0.01	0.08	0.08
<b>Southwest Portland Cement River Plant/Victorville</b>			
Non-Retail Gasoline Dispensing	0.02	0.00	0.00
Diesel Mobile Equipment	2.09	40.44	8.80
Gasoline Mobile Equipment	0.62	0.45	17.21
Propane Mobile Equipment	0.06	0.50	0.47
<b>Category Totals (tpy):</b>	<b>236.19</b>	<b>9782.93</b>	<b>2177.62</b>

Emission information was obtained from criteria emission inventory submissions. Emissions

were estimated using source test results for kilns and emission factors for other sources. Activity levels were provided by facilities.

**Category: Paint & Body Shops**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.04	0.00	0.00	(tons per ozone seasonal day)
	0.04	0.00	0.00	(tons per average annual day)
	14.10	0.00	0.00	(tons per year)

SIC 7532 (Automotive Top, Body, and Upholstery Repair Shops and Paint Shops)

Primary SCC 4-02-016-20 (Auto and Light Truck Repair Topcoat Application)

Paint & Body Shops is composed of the following 35 coating facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
A&A Auto Body & Glass/Hesperia	0.40	0.00	0.00
Accent Auto/Hesperia	0.57	0.00	0.00
Best Auto Body/Hesperia	0.05	0.00	0.00
CA Auto Restoration Service/Adelanto	0.40	0.00	0.00
California Classics Paint & Body/Hesperia	0.40	0.00	0.00
California Collision Center/Yucca Valley	0.40	0.00	0.00
Collision Craft/Hesperia	0.40	0.00	0.00
D&D Welding/Barstow	0.09	0.00	0.00
Dave's Auto Body/Lenwood	0.08	0.00	0.00
Derby Dink/Hesperia	0.84	0.00	0.00
Doman Auto Body/Hesperia	0.19	0.00	0.00
Doug's Auto Body/Barstow	0.40	0.00	0.00
Dream Detailing/Barstow	0.40	0.00	0.00
Happy Trails/Apple Valley	0.37	0.00	0.00
H&H Body Shop/Barstow	0.40	0.00	0.00
Ison's Quality Auto Body/Apple Valley	0.40	0.00	0.00
Jack B. Kelly/Adelanto	0.06	0.00	0.00
Lefevre's Tow & Body Shop/Yucca Valley	0.40	0.00	0.00
Louis Zamora Body & Paint/Victorville	0.06	0.00	0.00
McGeez Auto Body/Twenty-nine Palms	0.40	0.00	0.00
Mel's Auto Body/Apple Valley	0.40	0.00	0.00
Mojave Coach Works/Apple Valley	0.40	0.00	0.00
Monty's Chevrolet/Victorville	0.98	0.00	0.00
Nexday Paint & Body/Victorville	0.40	0.00	0.00
Pacific Paint & Body/Hesperia	0.17	0.00	0.00
Rancho Motors/Victorville	0.75	0.00	0.00
Rod's Body Shop/Barstow	0.40	0.00	0.00

Sonshine Auto/Victorville	0.99	0.00	0.00
Soutar's/Barstow	0.40	0.00	0.00
Sun & Shine Used Cars/Lenwood	0.05	0.00	0.00
Sunland Ford/Victorville	0.23	0.00	0.00
Sunset Paint & Body/Hesperia	0.93	0.00	0.00
Tri-Community Auto Body & Paint/Phelan	0.40	0.00	0.00
Yucca Auto Body/Yucca Valley	0.97	0.00	0.00
Yucca Valley Ford/Yucca Valley	0.32	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>14.10</b>	<b>0.00</b>	<b>0.00</b>

Emission information was obtained from criteria emission inventory submissions; this information represents the best available summary of paint & body activity and is a work in progress. Emissions were estimated using emission factors for coatings used by each facility. Activity levels were provided by facilities.

**Category: Natural Gas Utilities**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	1.33	14.52	1.97	(tons per ozone seasonal day)
	1.33	14.52	1.97	(tons per average annual day)
	480.20	5299.80	717.80	(tons per year)

SIC 4923 (Gas Transmission and Distribution)

Primary SCC 2-02-002-02 (Industrial IC Engine Natural Gas Reciprocating)

Four facilities make up Natural Gas Utilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
<b>Pacific Gas &amp; Electric/Hinkley</b>			
18 Natural Gas IC Engines	298.70	3504.00	443.20
<b>So. California Gas/Adelanto</b>			
Natural Gas IC Engines	3.05	32.75	4.10
Natural Gas Turbines	17.15	216.05	76.80
Coater	1.52	0.00	0.00
Tank	0.38	0.00	0.00
Natural Gas Releases	2.24	0.00	0.00
Vent Stack Fugitives	0.22	0.00	0.00
Degreasing Fugitives	0.18	0.00	0.00
Fittings Fugitives	0.14	0.00	0.00
Seals Fugitives	0.22	0.00	0.00
<b>So. California Gas/Newberry Springs</b>			
Ten Natural Gas IC Engines	144.07	1547.00	193.70
Coater	0.04	0.00	0.00

Tank	0.29	0.00	0.00
Natural Gas Releases	8.49	0.00	0.00
Fittings Fugitives	0.56	0.00	0.00
Degreasing Fugitives	1.13	0.00	0.00
Seals Fugitives	1.53	0.00	0.00
<b>So. California Gas/Victorville</b>			
Coater	0.02	0.00	0.00
Gasoline Dispensing	0.23	0.00	0.00
Degreasing Fugitives	0.04	0.00	0.00
<b>Category Totals (tpy):</b>	<b>480.20</b>	<b>5299.80</b>	<b>717.80</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using source test results for IC engines and emission factors for other sources. Activity levels were provided by facilities.

**Category: Wood Coating Operations**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.23	0.00	0.00	(tons per ozone seasonal day)
	0.23	0.00	0.00	(tons per average annual day)
	80.17	0.00	0.00	(tons per year)

SIC 2591 (Drapery Hardware & Blinds/Shades Manufacturing)  
 SIC 3931 (Musical Instrument Manufacturing)  
 Primary SCC 4-02-001-10 (Solvent Based Paint Surface Coating)

Wood Coating Operations is composed of the following six coating facilities:

Facility Name/Location	VOC	NO <sub>x</sub>	CO
C & M Wood Industries/Hesperia	29.10	0.00	0.00
Commercial Wood Products/Adelanto	3.14	0.00	0.00
Inland Panel/Adelanto	20.88	0.00	0.00
Mueller Turner/Yucca Valley	0.95	0.00	0.00
Terrell Industries/Hesperia	9.80	0.00	0.00
Walnut Valley Finishing/Adelanto	16.30	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>80.17</b>	<b>0.00</b>	<b>0.00</b>

Emission information was obtained from criteria emission inventory submissions. Emissions were estimated using emission factors specific to coating type(s) used by each facility. Activity levels were provided by facilities.

**b. STATIONARY AREA SOURCES**

For the purpose of this document, Stationary Area Sources are typically composed of many individually small but collectively significant sources that fall under the District's jurisdiction. "Methods for Assessing Area Source Emissions in California," CARB September 1991, is the primary area source methodology reference.

**Category: Agricultural and Commercial Pesticides**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	1.51	0.00	0.00	(tons per ozone seasonal day)
	1.51	0.00	0.00	(tons per average annual day)
	550.00	0.00	0.00	(tons per year)

1418 tons of Agricultural and Commercial pesticides were used in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 82289 Agricultural Residual Nonsynthetic Pesticides</b>			
33 tons sprayed	29.00	0.00	0.00
<b>CES 83212 Agricultural Synthetic Pesticides</b>			
34 tons sprayed	29.00	0.00	0.00
<b>CES 83220 Agricultural Nonsynthetic Pesticides</b>			
388 tons sprayed	80.00	0.00	0.00
<b>CES 83261 Other Nonagricultural Synthetic Pesticides</b>			
76 tons sprayed	58.00	0.00	0.00
<b>CES 83279 Other Nonagricultural Nonsynthetic Pesticides</b>			
214 tons sprayed	197.00	0.00	0.00
<b>CES 83329 Creosote Application</b>			
673 tons sprayed	157.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>550.00</b>	<b>0.00</b>	<b>0.00</b>

The federal ozone nonattainment area has 29,488 acres of agricultural land under cultivation, primarily alfalfa (17,358 acres), irrigated pasture (3150 acres), grain hay (2385 acres), grapes (1265 acres) and sudan grass (1161 acres).

Emissions estimates were made by CARB using area source methodologies. CARB used Pesticide Use Report data specific to the District as provided by local pesticide users to the California Department of Food and Agriculture. Pesticide emissions are determined by algorithms derived by CARB contractors for each pesticide type involving temperature, relative humidity, evaporation, pesticide vapor pressure, and pesticide molecular weight. Climatological data used was specific to the District. The federal ozone nonattainment area pesticide emissions were disaggregated from the District pesticide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent), since the majority of agricultural operations are within the federal ozone nonattainment area.

**Category: Architectural Coatings and Thinners**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	5.14	0.00	0.00	(tons per ozone seasonal day)
	4.06	0.00	0.00	(tons per average annual day)
	1482.00	0.00	0.00	(tons per year)

1,592,000 gallons of Architectural Coatings and Thinners were used in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 46755 Water-Based Architectural Coatings</b>			
965,000 gallons at 497.2 lbs/1000 gal	240.00	0.00	0.00
<b>CES 46763 Oil-Based Architectural Coatings</b>			
580,000 gallons at 3,760 lbs/1000 gal	1091.00	0.00	0.00
<b>CES 46771 Cleanup and Thinning Solvents</b>			
47,000 gallons at 6,400 lbs/1000 gal	151.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>1482.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made by CARB using area source methodologies. CARB used state-wide manufacturer surveys to establish emission factors and state-wide architectural coating and thinner production/consumption. State-wide consumption is allocated to the District using the District's proportion of the State-wide population (0.9 percent). The federal ozone nonattainment area consumption was disaggregated from the District consumption using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.265, reflecting increased use of architectural coatings during the warm summer months.

**Category: Asphalt Paving Applications**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.77	0.00	0.00	(tons per ozone seasonal day)
	0.77	0.00	0.00	(tons per average annual day)
	280.00	0.00	0.00	(tons per year)

400,016 tons of Asphalt Paving Materials were applied in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 46870 Cutback Asphalt</b>			
40 tons applied at 250 lbs/ton	5.00	0.00	0.00
<b>CES 46888 Road Oils</b>			
400 tons applied at 58 lbs/ton	12.00	0.00	0.00
<b>CES 46896 Hot-Mix Asphalt</b>			
393,000 tons applied at 0.8 lbs/ton	223.00	0.00	0.00
<b>CES 46904 Emulsified Asphalt</b>			
6,576 tons applied at 20 lbs/ton	40.00	0.00	0.00

**Category Totals (tons per year): 280.00 0.00 0.00**

Emissions estimates were made using District-determined activity rates and industry-accepted emission factors. Primary asphalt producers and consumers (such as asphalt batch plants, Caltrans, highway contractors, and the County of San Bernardino) were contacted to establish asphalt and asphalt product consumption. Asphalt and asphalt product producers, such as District asphalt batch plants, were consulted to determine asphalt application emission factors. The federal ozone nonattainment area asphalt product consumption was disaggregated from the District-wide asphalt product consumption using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Commercial Charbroilers**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.13	0.00	0.00	(tons per ozone seasonal day)
	0.13	0.00	0.00	(tons per average annual day)
	47.00	0.00	0.00	(tons per year)

115 Commercial Charbroilers operated in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 60418 Commercial Charbroiling</b>			
115 Commercial Charbroilers at 820 lbs/facility	47.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>47.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made using District-provided number of facilities and SCAQMD charbroiler facility-based emission factor. The number of commercial charbroilers was determined by reviewing a San Bernardino County permit list that included food preparation facilities. Charbroilers, deep fat fryers and unspecified cooking equipment were extracted from this list. The number of federal ozone nonattainment area charbroilers was disaggregated from the District number using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Commercial Liquid Petroleum Gas Combustion**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.01	0.25	0.05	(tons per ozone seasonal day)
	0.03	0.75	0.15	(tons per average annual day)
	11.00	275.00	55.00	(tons per year)

5,500,000 gallons of LPG were burned at Commercial sources in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 58727 Commercial LPG Combustion</b>			
5,500,000 gallons	11.00	275.00	55.00

**Category Totals (tons per year): 11.00 275.00 55.00**

Emissions estimates were made by CARB using area source methodologies; this category will be refined as more information becomes available, as it is believed the LPG throughput includes residential consumption. CARB used District-specific LPG consumption figures and EPA (AP-42) LPG equipment emission factors. The federal ozone nonattainment area LPG consumption was disaggregated from the District consumption using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 0.337, primarily reflecting decreased use of LPG in space heaters during the warm summer months.

**Category: Commercial Natural Gas Combustion**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.07	0.00	(tons per ozone seasonal day)
	0.00	0.13	0.01	(tons per average annual day)
	0.00	47.49	2.29	(tons per year)

655.03 mmcf of natural gas were burned in Commercial sources in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47167 Commercial Natural Gas Combustion - Unspecified</b>			
372.38 mmcf	0.00	27.00	1.30
<b>CES 58735 Commercial Natural Gas Combustion - Space Heating</b>			
205.68 mmcf	0.00	14.91	0.72
<b>CES 58743 Commercial Natural Gas Combustion - Water Heating</b>			
76.97 mmcf	0.00	5.58	0.27
<b>Category Totals (tons per year):</b>	<b>0.00</b>	<b>47.49</b>	<b>2.29</b>

Emissions estimates were made using District-determined commercial natural gas consumption and EPA/SCAQMD emission factors. The federal ozone nonattainment area commercial natural gas consumption was disaggregated from the District-wide consumption using the federal ozone nonattainment proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 0.434 for unspecified and space heating commercial natural gas use, 1.00 for water heating, primarily reflecting decreased use of LPG in space heaters during the warm summer months.

**Category: Gasoline Dispensing**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	3.26	0.00	0.00	(tons per ozone seasonal day)
	3.26	0.00	0.00	(tons per average annual day)
	1191.86	0.00	0.00	(tons per year)

219,858,643 gallons of gasoline were dispensed through 200 gasoline service stations in 1990; 698,667 gallons uncontrolled, 99,150,895 gallons through Phase I vapor recovery equipment, and 120,010,552 gallons through Phase I & II vapor recovery equipment:

Source Type	VOC	NO <sub>x</sub>	CO
<b>Uncontrolled Splash Fill</b>			
at 23 lbs/1000 gal	8.03	0.00	0.00
<b>CES 46532 Gasoline Dispensing Tanks - Working Losses</b>			
Phase I at 10 lbs/1000 gal	490.75	0.00	0.00
Phase I & II at 0.5 lbs/1000 gal	30.00	0.00	0.00
<b>CES 46540 Vehicle Refueling - Vapor Replacement</b>			
Phase I at 10.5 lbs/1000 gal	515.54	0.00	0.00
Phase I & II at 0.52 lbs/1000 gal	31.20	0.00	0.00
<b>CES 46557 Gasoline Dispensing Tanks - Breathing Losses</b>			
Phase I at 1.05 lbs/1000 gal	52.05	0.00	0.00
Phase I & II at 0.1 lbs/1000 gal	6.00	0.00	0.00
<b>CES 46565 Vehicle Refueling - Spillage</b>			
Phase I at 0.74 lbs/1000 gal	36.69	0.00	0.00
Phase I & II at 0.36 lbs/1000 gal	21.60	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>1191.86</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made using CARB area source methodologies; non-retail gasoline dispensing emissions will be added as information becomes available. Service station gasoline throughput is multiplied by emission factors for each gasoline transfer step (storage tank filling, vehicle filling, spillage during vehicle filling, and storage tank diurnal breathing). Emission factors are from AP-42 with phase II emission factors established by CARB service station certification testing. Emission factors have been adjusted to reflect MDAQMD rule effectiveness of 95 percent for Phase I and 96.5 percent for Phase II. Phase I/Phase II 1990 installation status and gasoline throughput were determined through analysis of District permit records. Federal ozone nonattainment area gasoline throughput was determined from District permit records and service station surveys.

**Category: Industrial Natural Gas Combustion**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.04	0.00	(tons per ozone seasonal day)
	0.00	0.03	0.00	(tons per average annual day)
	0.00	11.08	1.08	(tons per year)

126.59 mmcf of natural gas were burned in miscellaneous industrial sources in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47142 Industrial Natural Gas Combustion (Unspecified)</b>			
126.59 mmcf	0.00	11.08	1.08
<b>Category Totals (tons per year):</b>	<b>0.00</b>	<b>11.08</b>	<b>1.08</b>

Emissions estimates were made using District-determined industrial natural gas consumption (by uninventoried sources) and EPA/SCAQMD emission factors. The federal ozone nonattainment area industrial natural gas consumption was disaggregated from the District-wide consumption using the federal ozone nonattainment proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.277, reflecting increased use of natural gas by industry during the summer.

**Category: Landfill Biodegradation**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.15	0.00	0.00	(tons per ozone seasonal day)
	0.15	0.00	0.00	(tons per average annual day)
	55.00	0.00	0.00	(tons per year)

There were 12 landfills accepting municipal waste in 1990: Apple Valley, Barstow, Hesperia, Landers, Lenwood, Lucerne, Morongo, Newberry Springs, Phelan, USMC 29 Palms, Victorville, and Yermo

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 57281 Municipal Waste Disposal (Biodegradation)</b>			
5,238,000 tons of waste at 0.021 lbs/ton	55.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>55.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimate was made using District-provided landfill activity rate and CARB landfill gas emission factor, modified for District climate. District landfill waste totals were determined from landfill permits and historical permit activity as estimated by San Bernardino County Solid Waste Management. The landfill gas emission factor was modified by the District to reflect local (desert) effects on landfill gas generation rates. District landfill gas concentrations as measured with Solid Waste Assessment Tests were found to be 12.17 percent of state-wide average landfill gas concentrations. This factor was applied to the landfill gas emission factor. The federal ozone nonattainment area landfill gas emissions were disaggregated from the District landfill gas emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Livestock Waste Volatilization**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.41	0.00	0.00	(tons per ozone seasonal day)
	0.41	0.00	0.00	(tons per average annual day)
	160.00	0.00	0.00	(tons per year)

4,793,550 animals were resident in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 66605 Livestock Wastes</b>			
4,726,600 broilers at 0.24 lbs/broiler	57.00	0.00	0.00
11,800 beef cattle at 3.8 lbs/head	22.00	0.00	0.00
14,950 dairy cattle at 9.4 lbs/head	70.00	0.00	0.00
20,000 sheep at 0.07 lbs/head	1.00	0.00	0.00
2,800 swine at 0.7 lbs/head	1.00	0.00	0.00
18,000 horses at 1 lb/head	9.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>160.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made using District-determined livestock populations and EPA/SCAQMD emission factors modified by the District for local climate. The San Bernardino County Agricultural Commission, District University of California Cooperative Extension, Bureau of Land Management, and local veterinarians were contacted to obtain livestock populations. Population data was given as an instantaneous population, which was converted into an annual residence time by determining lifecycle (in the case of broilers, eight weeks out of ten for a residency factor of 0.8) or occupancy time within the District (in the case of sheep grazing on both BLM and private lands, half the year on average for a residency factor of 0.5). Species-specific factors from EPA/SCAQMD sources were used, adjusted where necessary for animal population age (size) mix. Climate effect was accounted for by using the District moisture factor of 0.1217, describing the relative humidity between the District and the State-wide average. This factor was determined by comparing District landfill gas generation to the state-wide average landfill gas generation rate. The federal ozone nonattainment area livestock population was disaggregated from the District-wide livestock population using the federal ozone nonattainment proportion of the District-wide human population (93.6 percent).

**Category: Residential Natural Gas Combustion**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.09	0.01	(tons per ozone seasonal day)
	0.00	0.17	0.03	(tons per average annual day)
	0.98	61.02	11.68	(tons per year)

1122.77 mmcf of natural gas were burned in residential equipment in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47191 Residential Natural Gas Combustion (Unspecified)</b>			
44.24 mmcf	0.06	1.61	1.31
<b>CES 54569 Residential Natural Gas Combustion (Space Heating)</b>			
528.04 mmcf	0.70	26.40	5.28
<b>CES 54577 Residential Natural Gas Combustion (Water Heating)</b>			
487.28 mmcf	0.14	30.70	3.22
<b>CES 54585 Residential Natural Gas Combustion (Cooking)</b>			
63.21 mmcf	0.08	2.31	1.87
<b>Category Totals (tons per year):</b>	<b>0.98</b>	<b>61.02</b>	<b>11.68</b>

Emissions estimates were made using District-determined residential natural gas consumption data and EPA/SCAQMD emission factors. The federal ozone nonattainment area residential natural gas consumption was disaggregated from the District-wide consumption using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 0.00 for unspecified and space heating, 1.00 for water heating and cooking, reflecting decreased residential use of natural gas for space heating during the warm summer months.

**Category: Residential Wood Combustion**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.00	0.00	(tons per ozone seasonal day)
	0.56	0.26	6.86	(tons per average annual day)
	204.72	94.33	2505.54	(tons per year)

29,477 tons of wood were burned in residential equipment in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>EIC 6106000230 Residential Wood Combustion - Wood Stoves</b>			
4761 tons burned	33.07	15.24	404.68
<b>EIC 6106020230 Residential Wood Combustion - Fireplaces</b>			
24716 tons burned	171.65	79.09	2100.86
<b>Category Totals (tons per year):</b>	<b>204.72</b>	<b>94.33</b>	<b>2505.54</b>

Emissions estimates were made by CARB using area source methodologies. CARB used EPA (AP-42) wood combustion emission factors and state-wide residential wood combustion. State-wide consumption is estimated by CARB and allocated to the District using the District's proportion of the state-wide population (0.9 percent). The federal ozone nonattainment area wood combustion was disaggregated from the District total using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 0.00, reflecting decreased residential use of wood for

heating during the warm summer months.

**Category: Open Burning**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.00	0.00	(tons per ozone seasonal day)
	0.16	0.00	3.35	(tons per average annual day)
	57.21	0.00	1221.96	(tons per year)

15,802 tons of material were burned in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47266 Tumbleweed Clearing/Burning</b>			
15,719 tons burned	56.73	0.00	1218.22
<b>CES 47282 Range Improvement Fires</b>			
83 tons burned	0.48	0.00	3.74
<b>Category Totals (tons per year):</b>	<b>57.21</b>	<b>0.00</b>	<b>1221.96</b>

Emissions estimates were made using District-determined open burning activity rates and CARB emission factors. District and County open burning permits were evaluated to determine burning activity rates (number of fires and average area cleared). CARB brush loading factors were used to estimate tumbleweed and range material loadings. CARB/BLM brushfire emission factors were used to estimate emissions. The federal ozone nonattainment area open burning emissions were disaggregated using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 0.00, reflecting the prohibition on permitted burns during the summer fire season.

**c. MOBILE SOURCES**

For the purpose of this document, Mobile Sources includes vehicles (such as cars, trucks, trains, off-road vehicles, etc.), mobile equipment (such as heavy diesel equipment), and light mobile equipment (such as chainsaws, lawnmowers, etc.). "Methods for Assessing Area Source Emissions in California," CARB September 1991, is the primary off-road mobile source methodology reference.

**Category: On-Road Mobile Sources**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	23.60	30.25	182.62	(tons per ozone seasonal day)
	23.60	30.25	182.62	(tons per average annual day)
	8614.00	11041.25	66656.3	(tons per year)

207,017 vehicles were operated on-road covering 8,007,000 miles per day in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>Heavy Duty Diesel Trucks</b>	1.59	12.77	5.63
1,812 vehicles covering 615,000 miles per day			
<b>Heavy Duty Gasoline Trucks</b>	1.44	3.89	29.62
5,364 vehicles making 138,732 daily trips over 427,000 miles			
<b>Light Duty Passenger Vehicles</b>	14.44	9.19	99.99
141,249 vehicles making 748,687 daily trips over 5,065,000 miles			
<b>Light Duty Trucks</b>	4.36	2.99	35.11
39,532 vehicles making 153,609 daily trips over 1,417,000 miles			
<b>Medium Duty Trucks</b>	1.63	1.38	11.84
12,703 vehicles making 48,876 daily trips over 456,000 miles			
<b>Motorcycles</b>	0.14	0.03	0.43
6,357 vehicles making 4,774 daily trips over 28,000 miles			
<b>Category Totals (tons per day):</b>	<b>23.60</b>	<b>30.25</b>	<b>182.62</b>

Emissions estimates were made by CARB (BURDEN rundates 9/9 and 9/12/94) using the BURDEN7F/EMFAC7F system with vehicle activity input for a portion of the District from SCAG's DTIM. This system uses population data to generate vehicle trips at average generation rates and average trip lengths. These trip numbers are then validated with actual Highway Performance Monitoring System vehicle counts on major arterials and highways. This validated trip information is then put through the EMFAC7F portion of the system, which applies emission factors based on the actual District vehicle fleet mix, derived from Department of Motor Vehicles records. System output takes the form of vehicle totals, vehicle miles travelled, number of trips, and total vehicular emissions (exhaust, diurnal, evaporation, running losses and resting losses). The federal ozone nonattainment area on-road vehicular emissions were disaggregated from the District-wide on-road vehicular emissions using the federal ozone nonattainment area proportion of the District-wide vehicular activity (63.62 percent).

**Category: Lawn & Garden Utility Equipment**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.22	0.01	1.37	(tons per ozone seasonal day)
	0.19	0.01	1.20	(tons per average annual day)
	69.35	1.94	438.15	(tons per year)

2,809,000 horsepower-hr of Lawn & Garden Utility Equipment were operated in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47449 Residential Lawn &amp; Garden Utility Equipment</b>			
1,380,000 horsepower-hr	18.25	1.01	217.65
<b>CES 66746 Commercial Lawn &amp; Garden Utility Equipment</b>			
1,429,000 horsepower-hr	51.10	0.93	220.50
<b>Category Totals (tons per year):</b>	<b>69.35</b>	<b>1.94</b>	<b>438.15</b>

Emissions estimates were made by CARB using area source methodologies and modified by the District to reflect the local desert climate. CARB determined California's share of national utility equipment sales and estimated the distribution of those sales between residential and commercial uses. Attrition scrappage rates, horsepower rating, average annual hours of use, and average load factors were estimated and used to generate state activity rates for residential and commercial equipment. Emissions were calculated using equipment-specific EPA (AP-42) emission factors. District emissions were extracted from state-wide emissions using the District proportion of the state population (0.9 percent). The District reduced the emissions by one-third to reflect the general lack of greenery in the District in relation to the state-wide average. The federal ozone nonattainment area emissions were disaggregated from the District emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.145, reflecting the increased use of lawn & garden equipment during the warm summer months.

**Category: Gasoline Recreational Boats**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.15	0.02	0.58	(tons per ozone seasonal day)
	0.12	0.01	0.48	(tons per average annual day)
	44.00	5.15	173.49	(tons per year)

152,000 gallons of gasoline were burned in Gasoline Recreational Boats in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 58610 Gasoline Recreational Boats</b>			
152,000 gallons burned	44.00	5.15	173.49
<b>Category Totals (tons per year):</b>	<b>44.00</b>	<b>5.15</b>	<b>173.49</b>

Emissions estimates were made by CARB using area source methodologies. CARB used

District-specific Department of Motor Vehicles boat registration data, estimated boat activity rates (by use area), and District-specific estimated use area (specifying length of river and area of lakes). Emissions were calculated using EPA (AP-42) emission factors. The federal ozone nonattainment area boat activity was disaggregated from the District-wide activity by 95% to reflect the exclusion of the Colorado River traffic from the federal ozone nonattainment area. Ozone seasonal day emissions were estimated using a temporal factor of 1.217, reflecting the increased use of recreational boats during the warm summer months.

**Category: Off-Road Heavy Duty Farm Equipment**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.01	0.04	0.19	(tons per ozone seasonal day)
	0.01	0.04	0.18	(tons per average annual day)
	4.43	14.49	67.08	(tons per year)

1,359,000 horsepower-hr of Heavy Duty Farm Equipment were operated in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 81919 Off-Road Heavy Duty Gasoline Farm Equipment</b>			
330,000 horsepower-hr	3.07	2.02	61.78
<b>CES 81927 Off-Road Heavy Duty Diesel Farm Equipment</b>			
1,029,000 horsepower-hr	1.36	12.47	5.30
<b>Category Totals (tons per year):</b>	<b>4.43</b>	<b>14.49</b>	<b>67.08</b>

Emissions estimates were made by CARB using area source methodologies. CARB established a state-wide inventory of agricultural heavy duty equipment using annual sales records and an annual scrappage attrition rate broken down by equipment type, horsepower, annual hourly usage, and load factors. This generates a state-wide inventory of agricultural heavy duty equipment. The District inventory is extracted by applying the District's fraction of state-wide agricultural activity (0.04 percent). Emissions are calculated using EPA (AP-42) heavy duty equipment emission factors. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.060, reflecting the increased use of heavy duty diesel farm equipment during the longer summer days.

**Category: Off-Road Heavy Duty Non-Farm Equipment**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.57	5.31	15.59	(tons per ozone seasonal day)
	0.57	5.31	15.59	(tons per average annual day)
	208.00	1938.99	5689.36	(tons per year)

173 million horsepower-hr of Off-Road Heavy Duty Non-Farm Equipment operated in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 82164 Gasoline Heavy-Duty Equipment</b>			
26,344,000 horsepower-hr	29.00	161.34	4933.05
<b>CES 83097 Diesel Heavy-Duty Equipment</b>			
146,713,000 horsepower-hr	179.00	1777.65	756.31
<b>Category Totals (tpy):</b>	<b>208.00</b>	<b>1938.99</b>	<b>5689.36</b>

Emissions estimates were made by CARB using area source methodologies. CARB established a state-wide inventory of non-farm heavy duty equipment using annual sales records and an annual scrappage attrition rate broken down by equipment type, horsepower, annual hourly usage, and load factors. CARB then assigns these equipment to construction, mining and logging industries. This generates a state-wide inventory of non-farm equipment by industry. The District inventory is extracted by applying District-specific construction, mining and logging industry activity rates as a proportion to the state totals. Emissions are calculated using EPA (AP-42) heavy duty non-farm equipment emission factors. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Light Duty Industrial Equipment**

	VOC	NO <sub>x</sub>	
Total Emissions:	0.07	0.04	0.20 (tons per ozone seasonal day)
	0.07	0.04	0.20 (tons per average annual day)
	25.48	15.53	71.60 (tons per year)

139,000 gallons of fuel were burned in Light Duty Industrial Equipment in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 54379 Light Duty Diesel Industrial Equipment</b>			
22,000 gallons burned	0.48	4.88	1.05
<b>CES 54387 Light Duty Gasoline Industrial Equipment</b>			
46,000 gallons burned	7.00	0.35	69.26
<b>CES 54429 Light Duty LPG Industrial Equipment</b>			
71,000 gallons burned	18.00	10.30	1.29
<b>Category Totals (tons per year):</b>	<b>25.48</b>	<b>15.53</b>	<b>71.60</b>

Emissions estimates were made by CARB using area source methodologies. CARB estimated industrial light duty equipment activity from equipment sales figures, attrition scrappage estimates, and annual use estimates. Emissions were calculated using light-duty equipment-specific EPA (AP-42) emission factors. District emissions were extracted from the state-wide total using the District proportion of the state-wide population (0.9 percent). The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the

federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Locomotive Operations**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	1.40	26.25	4.62	(tons per ozone seasonal day)
	1.40	26.25	4.62	(tons per average annual day)
	511.00	9581.25	1686.30	(tons per year)

10,565,000 gallons of fuel burned in locomotives in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47597 Locomotives Road Hauling</b>			
10,257,000 gallons diesel burned	485.00	9139.60	1624.25
<b>CES 47605 Locomotives Switching</b>			
308,000 gallons diesel burned	26.00	441.65	62.05
<b>Category Totals (tpy):</b>	<b>511.00</b>	<b>9581.25</b>	<b>1686.30</b>

Emissions estimates were made by CARB using area sources methodologies. CARB determined county-specific locomotive line haul and switching fuel consumption and applied EPA (AP-42) line haul and switching locomotive emission factors. 90 percent of District-wide line haul emissions were disaggregated to the federal ozone nonattainment area based on track mileage and the location of the Summit in the federal ozone nonattainment area. All of the District-wide switching emissions were disaggregated to the federal ozone nonattainment area as the major rail yard (AT&SF Barstow) is within the federal ozone nonattainment area.

**Category: Off-Road Vehicles**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.30	0.04	0.99	(tons per ozone seasonal day)
	0.25	0.03	0.81	(tons per average annual day)
	91.00	11.97	295.50	(tons per year)

428,000 gallons of fuel were burned in Off-Road Vehicles in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 83477 All Terrain Vehicles</b>			
101,000 gallons burned	73.00	1.18	115.65
<b>CES 54411 Four-Wheel Drive Vehicles</b>			
327,000 gallons burned	18.00	10.79	179.85
<b>Category Totals (tons per year):</b>	<b>91.00</b>	<b>11.97</b>	<b>295.50</b>

Emissions estimates were made by CARB using area source methodologies. CARB established a relationship between registered off-road vehicles and non-registered off-road vehicles and

estimated the average vehicle fuel consumption. These factors are applied to District-specific registered off-road vehicle data obtained from the California Department of Transportation. Emissions were calculated using CARB Mobile Source Division four-wheel drive and EPA (AP-42) all terrain vehicle emission factors. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.217, reflecting the increased use of off-road recreational vehicles during the warm summer months.

**Category: Off-Road Motorcycles**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.21	0.01	0.70	(tons per ozone seasonal day)
	0.17	0.01	0.58	(tons per average annual day)
	63.00	4.12	210.41	(tons per year)

142,000 gallons were burned in Off-Road Motorcycles in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
CES 47464 Off-Road Motorcycle Use			
142,000 gallons burned	63.00	4.12	210.41
<b>Category Totals (tons per year):</b>	<b>63.00</b>	<b>4.12</b>	<b>210.41</b>

Emissions estimates were made by CARB using area source methodologies. CARB established the distribution of state-wide motorcycles between on-highway (with eight percent off-highway use), dual purpose, off-highway, and competition. This distribution is applied to District-specific motorcycle registration records from the Department of Motor Vehicles to determine the District motorcycle population. CARB estimated annual fuel use for each motorcycle category. Emissions were calculated using CARB motorcycle-category specific emission factors. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population. Ozone seasonal day emissions were estimated using a temporal factor of 1.217, reflecting the increased use of off-road motorcycles during the warm summer months.

**d. MISCELLANEOUS AREA SOURCES**

For the purpose of this document, Miscellaneous Area Sources are typically composed of many individually small but collectively significant sources that do not fall under the District's jurisdiction. "Methods for Assessing Area Source Emissions in California," CARB September 1991, is the primary area source methodology reference.

**Category: Adhesives and Sealants**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.30	0.00	0.00	(tons per ozone seasonal day)
	0.30	0.00	0.00	(tons per average annual day)
	110.00	0.00	0.00	(tons per year)

717 tons of Adhesives and Sealants were used in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 83030 Solvent Based Adhesives and Sealants</b>			
137 tons	84.00	0.00	0.00
<b>CES 83063 Water Based Adhesives and Sealants</b>			
580 tons	26.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>110.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made by CARB using area source methodologies. CARB estimated state-wide adhesive and sealant use through manufacturer surveys. Emissions were estimated using manufacturer data. District adhesive and sealant emissions were extracted from state-wide emissions using the District proportion of the State population (0.9 percent). The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Automobile Fires**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.00	0.00	0.01	(tons per ozone seasonal day)
	0.00	0.00	0.01	(tons per average annual day)
	0.90	0.08	3.55	(tons per year)

334 Automobiles burned in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 57307 Automobile Fires</b>			
334 autos burned	0.90	0.08	3.55
<b>Category Totals (tons per year):</b>	<b>0.90</b>	<b>0.08</b>	<b>3.55</b>

Emissions estimates were made by CARB using area source methodologies. CARB used the California Fire Incident Reporting System to identify the number of vehicle fires by county. Emissions were estimated using weighted averages of USEPA automobile structure and component combustion emissions. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Consumer Products**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	2.33	0.00	0.00	(tons per ozone seasonal day)
	2.33	0.00	0.00	(tons per average annual day)
	851.00	0.00	0.00	(tons per year)

851 tons of Consumer Products were used in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 83089 Consumer Nonaerosol Solvents</b>			
336 tons of solvent consumed	336.00	0.00	0.00
<b>CES 83196 Consumer Aerosol Propellants</b>			
135 tons of solvent consumed	135.00	0.00	0.00
<b>CES 83204 Consumer Aerosol Solvents</b>			
325 tons of solvent consumed	325.00	0.00	0.00
<b>CES 83238 Consumer Aerosol Pesticides - Propellant</b>			
15 tons of solvent consumed	15.00	0.00	0.00
<b>CES 83246 Consumer Aerosol Pesticides - Ingredient</b>			
40 tons of solvent consumed	40.00	0.00	0.00
<b>Category Totals (tons per year):</b>	<b>851.00</b>	<b>0.00</b>	<b>0.00</b>

Emissions estimates were made by CARB using area source methodologies. CARB estimated state-wide consumer product use through market research and manufacturer surveys. Emissions were estimated using product testing and manufacturer data. District consumer product emissions were extracted from state-wide emissions using the District proportion of the State population (0.9 percent). The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Truck Transport Refrigerators**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.01	0.09	0.04	(tons per ozone seasonal day)
	0.01	0.09	0.04	(tons per average annual day)
	4.00	33.00	15.00	(tons per year)

2,860,000 horsepower-hr of Diesel Transport Refrigeration Units were operated in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 54353 Diesel Transport Refrigeration Units</b>			
2,860,000 horsepower-hr	4.00	33.00	15.00
<b>Category Totals (tons per year):</b>	<b>4.00</b>	<b>33.00</b>	<b>15.00</b>

Emissions estimates was made by CARB using area source methodology. CARB used District-specific California Department of Transportation data on registered refrigeration trucks and trailers and estimated engine size, load factor, usage and fuel type to determine refrigerator unit activity in horsepower-hour. Emissions were calculated using CARB estimated emission factors. The federal ozone nonattainment area emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population (93.6 percent).

**Category: Unplanned Fires**

	VOC	NO <sub>x</sub>	CO	
Total Emissions:	0.35	0.08	4.94	(tons per ozone seasonal day)
	0.25	0.06	3.51	(tons per average annual day)
	90.94	20.45	1280.12	(tons per year)

Three categories of Unplanned Fires burned in 1990:

Source Type	VOC	NO <sub>x</sub>	CO
<b>CES 47308 Wildfires - Grass &amp; Woodland</b>			
203 acres burned	2.77	0.46	20.50
<b>CES 47316 Wildfires - Timber &amp; Brush</b>			
609 acres burned	82.21	18.27	1187.55
<b>CES 47324 Structural Fires</b>			
440 fires	5.96	1.72	72.07
<b>Category Totals (tons per year):</b>	<b>90.94</b>	<b>20.45</b>	<b>1280.12</b>

Emissions estimates were made by CARB using area source methodologies. CARB used California Department of Forestry and United States Forest Service District-specific historical wildfire data, an estimated timber & brush fuel load of 15 tons/acre, and EPA (AP-42) wildfire emission factors to determine District wildfire emissions. The federal ozone nonattainment area wildfire emissions was disaggregated using the federal ozone nonattainment area proportion of the District-wide area (39.45 percent). Ozone seasonal day emissions were estimated using a temporal factor of 1.434, reflecting the increased level of wildfire activity during the warm summer months.

CARB used California Fire Incident Reporting System data for structural fires, an average fuel load of 0.59 tons/fire, and EPA (AP-42) fire emission factors to determine State-wide structural

fire emissions. District structural fire emissions were extracted from the state total using the District's proportion of state housing units (0.9 percent). The federal ozone nonattainment area structural fire emissions were disaggregated from the District-wide emissions using the federal ozone nonattainment area proportion of the District-wide population.

Attachment A

**Mojave Desert AQMD**  
**2007 Attainment Demonstration Plan**  
**VOC and NO<sub>x</sub> Emission Inventories**

(San Bernardino County Portion of the  
Southeast Desert Modified Air Quality Management Area)

**Summary**

**Mojave Desert AQMD**  
**ADP 1990 Emission Inventory Summary**  
**Average Ozone Seasonal Day**

Category	Source Totals (tons per os day)		
	VOC	NOx	CO
Stationary Point	5.58	51.05	23.08
Stationary Area	11.38	0.45	0.06
On Road Mobile	23.60	30.25	182.62
Off Road Mobile	2.93	31.71	24.25
Miscellaneous Area	2.99	0.17	5.00
<b>Total ADP 1990 Emission Inventory:</b>	<b>46.50</b>	<b>113.65</b>	<b>235.01</b>

*ADP Forecast VOC and NOx Emission Inventories:*

Estimated Total 1996	43.20	110.55
Estimated Total 1999	45.19	109.72
Estimated Total 2002	49.07	110.74
Estimated Total 2005	53.96	112.76
Estimated Total 2007	57.27	114.07

**Notes:**

Ozone season is the three month period from June through August.

Where ozone seasonal activity information was not available annual average data was used.

Values may not total due to rounding.

# Mojave Desert AQMD

## ADP 1990 Emission Inventory Summary

### Stationary Sources

Source Category	Type	(tons per os day)		
		VOC	NO <sub>x</sub>	CO
Aerochem (Chemical Milling - Etching)	point	0.04	0.02	0.00
AFG (NG Glass Furnace)	point	0.01	2.16	0.03
Agcon (Concrete Batch Plant)	point	0.00	0.01	0.00
Apple Valley Airport (General Aviation Aircraft)	point	0.02	0.01	1.33
Barstow-Daggett Airport (General Aviation Aircraft)	point	0.02	0.01	1.33
Hesperia Airport (General Aviation Airport)	point	0.02	0.01	1.33
Twentynine Palms Airport (General Aviation Airport)	point	0.00	0.00	0.08
AT&SF Barstow Rail Depot (NG Boiler, Petroleum Handling)	point	0.05	0.03	0.10
Barstow WWTP (NG IC Engine and Incinerator)	point	0.00	0.10	0.01
Boral Resources, Inc. (Asphalt Batch Plants)	point	0.00	0.02	0.01
Brubaker-Mann Inc. (Rock Mining and Processing)	point	0.00	0.01	0.00
Cal-West Rock (Rock Mining and Processing)	point	0.01	0.07	0.06
CalNev Pipeline Barstow (Petroleum Terminal)	point	0.07	0.00	0.00
CalNev Pipeline GAFB (petroleum Terminal)	point	0.01	0.00	0.00
Fiberglass Operations (Pacific Tank)	point	0.01	0.00	0.00
Crystal Hills Sand & Gravel (Sand & Gravel Plant)	point	0.00	0.00	0.01
Daggett Leasing (Natural Gas Boiler and Heaters)	point	0.02	0.03	0.02
Edwards Air Force Base (Rocket Test Stands)	point	0.00	0.00	0.05
George Air Force Base (Aircraft, Vehicles, Fuel, Coatings)	point	0.94	1.31	2.86
Harper Lake (Natural Gas Boilers)	point	0.05	0.03	0.03
Hi-Desert Medical (Incinerator)	point	0.00	0.00	0.00
Industrial Asphalt (Asphalt Batch and Sand & Gravel Plant)	point	0.00	0.00	0.01
Kramer Junction (NG Boiler)	point	0.06	0.18	0.08
Memorial Conservatory (Incinerator)	point	0.00	0.00	0.00
Miscellaneous Coaters (Six coaters, ex: Northwest)	point	0.02	0.01	0.00
Mitsubishi Cement (Coal-fired Kiln)	point	0.09	7.04	1.25
Paint & Body Shops (35 shops, ex: Sonshine Auto)	point	0.04	0.00	0.00
Partin Limestone Products (Limestone Mining & Processing)	point	0.00	0.07	0.04
PG&E Hinkley (NG IC Engines)	point	0.82	9.60	1.21
Pluess-Staufner (Limestone Mining and Processing)	point	0.01	0.01	0.01
Rheox Mine (Clay Mining)	point	0.00	0.06	0.03
Rheox Plant (Clay Processing)	point	0.00	0.02	0.01
Riverside Cement (Coal-fired Kiln and NG Boiler)	point	0.34	9.41	0.73
Saint Mary Desert Valley Hospital (NG Boilers)	point	0.00	0.01	0.00
SCE Coolwater (NG Turbines and Boilers)	point	0.99	4.11	2.35
Sierra Aggregate Co. (Rock Mining and Processing)	point	0.00	0.01	0.01
SoCalGas Adelanto (NG Turbines)	point	0.08	0.68	0.22
SoCalGas Newberry Springs (NG IC Engines)	point	0.43	4.24	0.53
SoCalGas Victorville (Fuel, Degreasing)	point	0.00	0.00	0.00
Southwest Portland Cement Quarry (Coal-fired Kiln)	point	0.21	10.25	3.91
Southwest Portland Cement River (Rock Mining and Processing)	point	0.00	0.11	0.07
Specialty Minerals (Limestone Mining and Processing)	point	0.01	0.10	0.04
USMC AGCC 29 Palms (Boilers, Fuel, Coatings)	point	0.59	0.71	3.46
USMC Logistics Base Nebo (Boilers, Fuel, Coatings)	point	0.08	0.26	0.33

# Mojave Desert AQMD

Source Category	Type	(tons per os day)		
		VOC	NOx	CO
USMC Logistics Base Yermo (Boilers, Fuel, Coatings)	point	0.29	0.21	1.50
U.S. West (NG Boilers)	point	0.00	0.06	0.01
Victor Valley Hospital (NG and Fuel Oil Boilers)	point	0.02	0.06	0.01
Victor Valley Memorial Park (Incinerator)	point	0.00	0.00	0.00
Victor Valley Ready Mix (Concrete Batch Plant)	point	0.00	0.00	0.00
Victor Valley WWRA (Process Gas IC Engine and Flare)	point	0.00	0.01	0.01
Victorville Industrial Minerals (Rock Mining and Processing)	point	0.00	0.01	0.01
Victorville Oil (Petroleum Terminal)	point	0.00	0.00	0.00
Wilde Horse (Aggregate and Concrete Batch Plant)	point	0.00	0.00	0.00
Wood Coaters (Six coaters, ex: C&M Wood Ind.)	point	0.23	0.00	0.00
<b>Point Source Totals:</b>		<b>5.58</b>	<b>51.05</b>	<b>23.08</b>
Agricultural & Commercial Pesticides	area	1.51	0.00	0.00
Architectural Coatings and Thinners	area	5.14	0.00	0.00
Asphalt Paving Applications	area	0.77	0.00	0.00
Commercial Charbroilers (95 charbroilers in 1990)	area	0.13	0.00	0.00
Commercial LPG Combustion	area	0.01	0.25	0.05
Commercial Natural Gas Combustion	area	0.00	0.07	0.00
Gasoline Service Stations (188 stations in 1990)	area	3.26	0.00	0.00
Industrial Natural Gas Combustion (Unspecified)	area	0.00	0.04	0.00
Landfill Biodegradation (15 landfills)	area	0.15	0.00	0.00
Livestock Waste Volatilization (4,815,550 head in 1990)	area	0.41	0.00	0.00
Open Burning (15,802 tons in 1990)	area	0.00	0.00	0.00
Residential Natural Gas Combustion	area	0.00	0.09	0.01
Residential Wood Combustion	area	0.00	0.00	0.00
<b>Area Source Totals:</b>		<b>11.38</b>	<b>0.45</b>	<b>0.06</b>
<b>Stationary Source Totals:</b>		<b>16.96</b>	<b>51.50</b>	<b>23.14</b>

**Notes:**

Stationary sources are defined as those point and area sources under MDAQMD jurisdiction

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP 1990 Emission Inventory Summary

### Mobile Sources

Source Category	Type	(tons per os day)		
		VOC	NOx	CO
On-Road HD Diesel Trucks	on-road	1.59	12.77	5.63
On-Road HD Gasoline Trucks	on-road	1.44	3.89	29.62
On-Road LD Trucks	on-road	4.36	2.99	35.11
On-Road MD Trucks	on-road	1.63	1.38	11.84
On-Road LD Passenger Vehicles	on-road	14.44	9.19	99.99
On-Road Motorcycles	on-road	0.14	0.03	0.43
<b>On-Road Totals:</b>		<b>23.60</b>	<b>30.25</b>	<b>182.62</b>
Commercial Lawn & Garden Equipment	off-road	0.16	0.00	0.69
Gasoline Recreational Boats	off-road	0.15	0.02	0.58
Heavy Duty Diesel Farm Equipment	off-road	0.00	0.03	0.01
Heavy Duty Diesel Non-Farm Equipment	off-road	0.49	4.87	2.07
Heavy Duty Gasoline Farm Equipment	off-road	0.01	0.01	0.18
Heavy Duty Gasoline Non-Farm Equipment	off-road	0.08	0.44	13.52
Light Duty Diesel Industrial Equipment	off-road	0.00	0.01	0.00
Light Duty Gasoline Industrial Equipment	off-road	0.02	0.00	0.19
Light Duty LPG Industrial Equipment	off-road	0.05	0.03	0.00
Locomotive Road Hauling	off-road	1.33	25.04	4.45
Locomotive Switching	off-road	0.07	1.21	0.17
Off-Road All Terrain Vehicles	off-road	0.24	0.00	0.39
Off-Road Four-Wheel Drive	off-road	0.06	0.04	0.60
Off-Road Motorcycles	off-road	0.21	0.01	0.70
Residential Lawn & Garden Equipment	off-road	0.06	0.00	0.69
<b>Off-Road Totals:</b>		<b>2.93</b>	<b>31.71</b>	<b>24.25</b>
<b>Mobile Source Totals:</b>		<b>26.53</b>	<b>61.96</b>	<b>206.87</b>

**Notes:**

Mobile sources are defined as all on- and off-road mobile and area sources

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP 1990 Emission Inventory Summary

### Miscellaneous Area Sources

Source Category	Type	(tons per os day)		
		VOC	NOx	CO
Adhesives and Sealants	area	0.30	0.00	0.00
Automobile Fires	area	0.00	0.00	0.01
Consumer Aerosol Pesticides - Ingredient	area	0.11	0.00	0.00
Consumer Aerosol Pesticides - Propellant	area	0.04	0.00	0.00
Consumer Aerosol Propellants	area	0.37	0.00	0.00
Consumer Aerosol Solvents	area	0.89	0.00	0.00
Consumer Nonaerosol Solvents	area	0.92	0.00	0.00
Diesel Transport Refrigerators	area	0.01	0.09	0.04
Structural Fires	area	0.02	0.01	0.20
Wildfires - Grass & Woodland	area	0.01	0.00	0.08
Wildfires - Timber & Brush	area	0.32	0.07	4.67
<b>Miscellaneous Source Totals:</b>		<b>2.99</b>	<b>0.17</b>	<b>5.00</b>
<b>ADP 1990 Baseline Emission Inventory Totals:</b>		<b>46.50</b>	<b>113.65</b>	<b>235.01</b>

**Notes:**

Miscellaneous sources are defined as all area sources not under MDAQMD purview

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP VOC Inventory Forecast Summary Stationary Sources

Source Category/Industry	Growth	(tons per os day)					
		1990	1996	1999	2002	2005	2007
Cement Manufacturing (four facilities)	Cement	0.65	0.65	0.65	0.65	0.65	0.65
Concrete and Asphalt Plants (five facilities)	Batch	0.00	0.00	0.00	0.00	0.00	0.00
Crematoria (two facilities)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Electric Utilities and Generators (five facilities)	Electric	1.12	1.13	1.13	1.13	1.13	1.13
Fiberglass Operations (one facility)	Fiber	0.01	0.31	0.34	0.37	0.40	0.42
General Aviation Aircraft (four airports)	Air	0.07	0.08	0.09	0.10	0.11	0.11
Glass Manufacturing (one facility)	Glass	0.01	0.01	0.01	0.01	0.01	0.01
Medical Facilities (three facilities)	Pop	0.02	0.03	0.03	0.04	0.05	0.05
Military Bases (five facilities)	None	1.90	1.90	1.90	1.90	1.90	1.90
Mineral Mining and/or Processing (10 facilities)	Mineral	0.03	0.03	0.03	0.03	0.03	0.03
Coating Operations (13 facilities)	Coater	0.29	0.58	0.70	0.74	0.78	0.81
Natural Gas Utilities (four facilities)	NG	1.33	1.33	1.36	1.36	1.36	1.36
Paint & Body Shops (35 facilities)	Pop	0.04	0.06	0.07	0.08	0.09	0.10
Petroleum Terminals (three facilities)	Petro	0.08	0.10	0.12	0.13	0.15	0.16
Public Wastewater Treatment (two facilities)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Rail Depot (one facility)	Rail	0.05	0.05	0.05	0.05	0.05	0.05
<b>Point Source Totals:</b>		<b>5.60</b>	<b>6.26</b>	<b>6.47</b>	<b>6.58</b>	<b>6.70</b>	<b>6.77</b>
Agricultural & Commercial Pesticides	Ag	1.51	1.77	1.95	2.05	2.19	2.30
Architectural Coatings and Thinners	HU	5.14	7.45	8.58	10.02	11.57	12.64
Asphalt Paving Applications	Emp	0.77	0.97	1.07	1.22	1.39	1.49
Commercial Charbroilers (95 charbroilers)	Pop	0.13	0.19	0.22	0.25	0.29	0.32
Commercial LPG Combustion	Emp	0.01	0.01	0.01	0.02	0.02	0.02
Commercial Natural Gas Combustion	Emp	0.00	0.00	0.00	0.00	0.00	0.00
Gasoline Dispensing (300 permits)	Pop	3.26	4.73	5.48	6.39	7.37	8.02
Industrial Natural Gas Combustion	Emp	0.00	0.00	0.00	0.00	0.00	0.00
Landfill Biodegradation (15 landfills)	Pop	0.15	0.22	0.25	0.29	0.34	0.37
Livestock Waste Volatilization	Ag	0.41	0.48	0.53	0.56	0.59	0.62
Open Burning (15,802 tons in 1990)	None	0.00	0.00	0.00	0.00	0.00	0.00
Residential Natural Gas Combustion	HU	0.00	0.00	0.00	0.00	0.00	0.00
Residential Wood Combustion	HU	0.00	0.00	0.00	0.00	0.00	0.00
<b>Area Source Totals:</b>		<b>11.38</b>	<b>15.82</b>	<b>18.09</b>	<b>20.81</b>	<b>23.75</b>	<b>25.78</b>
<b>Stationary Source Totals:</b>		<b>16.98</b>	<b>22.07</b>	<b>24.57</b>	<b>27.39</b>	<b>30.45</b>	<b>32.56</b>

**Notes:**

Stationary sources are defined as those point and area sources under MDAQMD jurisdiction

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP VOC Inventory Forecast Summary

### Mobile and Miscellaneous Area Sources

Source Category	Growth	(tons per os day)					
		1990	1996	1999	2002	2005	2007
On-Road HD Diesel Trucks	On-Road	1.59	1.84	1.77	1.87	2.04	2.16
On-Road HD Gasoline Trucks	On-Road	1.44	0.73	0.63	0.58	0.56	0.54
On-Road LD Trucks	On-Road	4.36	2.07	1.85	1.63	1.42	1.28
On-Road MD Trucks	On-Road	1.63	0.97	0.81	1.74	3.21	4.19
On-Road LD Passenger Vehicles	On-Road	14.44	7.83	7.03	6.23	5.45	4.92
On-Road Motorcycles	On-Road	0.14	0.12	0.12	0.13	0.16	0.17
On-Road Totals:		23.60	13.56	12.21	12.18	12.84	13.26
Lawn & Garden Equipment	HU	0.22	0.32	0.37	0.43	0.50	0.54
Gasoline Recreational Boats	Pop	0.15	0.22	0.25	0.29	0.34	0.37
Off-Road Heavy Duty Farm Equipment	Ag	0.01	0.01	0.01	0.01	0.01	0.02
Off-Road Heavy Duty Non-Farm Equipment	Emp	0.57	0.72	0.79	0.90	1.03	1.11
Light Duty Industrial Equipment	Emp	0.07	0.09	0.10	0.11	0.13	0.14
Locomotive Operations	Rail	1.40	1.36	1.34	1.34	1.34	1.34
Off-Road Vehicles	Pop	0.30	0.44	0.50	0.59	0.68	0.74
Off-Road Motorcycles	Pop	0.21	0.30	0.35	0.41	0.47	0.52
Off-Road Totals:		2.93	3.45	3.72	4.09	4.50	4.77
Adhesives and Sealants	Emp	0.30	0.38	0.42	0.47	0.54	0.58
Automobile Fires	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	Pop	2.33	3.38	3.91	4.57	5.27	5.73
Truck Transport Refrigerators	Emp	0.01	0.01	0.01	0.02	0.02	0.02
Unplanned Fires	None	0.35	0.35	0.35	0.35	0.35	0.35
Miscellaneous Area Totals:		2.99	4.12	4.70	5.41	6.17	6.68
Mobile and Misc. Area Source Totals:		29.52	21.13	20.63	21.68	23.51	24.71
Forecast VOC Totals:		46.50	43.20	45.19	49.07	53.96	57.27

**Notes:**

Mobile sources are defined as all on- and off-road mobile and area sources  
 All inventories include "fugitives," when available  
 0.00 indicates a value < 0.005 tons per day  
 This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP NOx Inventory Forecast Summary

### Stationary Sources

Source Category/Industry	Growth	(tons per os day)					
		1990	1996	1999	2002	2005	2007
Cement Manufacturing (four facilities)	Cement	26.80	26.80	26.80	26.80	26.80	26.80
Concrete and Asphalt Plants (five facilities)	Batch	0.04	0.04	0.05	0.04	0.05	0.05
Crematoria (two facilities)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Electric Utilities or Generators (five facilities)	Electric	4.41	4.45	4.45	4.45	4.45	4.45
Fiberglass Operations (one facility)	Fiber	0.00	0.00	0.00	0.00	0.00	0.00
General Aviation Aircraft (four airports)	Air	0.02	0.02	0.03	0.03	0.03	0.03
Glass Manufacturing (one facility)	Glass	2.16	2.16	2.16	2.16	2.16	2.16
Medical Facilities (three facilities)	Pop	0.07	0.10	0.12	0.14	0.16	0.17
Military Bases (five facilities)	None	2.49	2.49	2.49	2.49	2.49	2.49
Mineral Mining or Processing (10 facilities)	Mineral	0.38	0.39	0.39	0.38	0.35	0.35
Coating Operations (13 facilities)	Coater	0.03	0.06	0.07	0.08	0.08	0.08
Natural Gas Utilities (four facilities)	NG	14.52	14.52	14.81	14.81	14.81	14.81
Paint & Body Shops (35 facilities)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Petroleum Terminals (three facilities)	Petro	0.00	0.00	0.00	0.00	0.00	0.00
Public Wastewater Treatment (two facilities)	Pop	0.11	0.16	0.18	0.22	0.25	0.27
Rail Depot (one facility)	Rail	0.03	0.03	0.03	0.03	0.03	0.03
Point Source Totals:		51.06	51.23	51.58	51.62	51.66	51.70
Agricultural & Commercial Pesticides	Ag	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coatings and Thinners	HU	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paving Applications	Emp	0.00	0.00	0.00	0.00	0.00	0.00
Commercial Charbroilers (95 charbroilers)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Commercial LPG Combustion	Emp	0.25	0.32	0.35	0.40	0.45	0.49
Commercial Natural Gas Combustion	Emp	0.07	0.09	0.10	0.11	0.13	0.14
Gasoline Service Stations (188 stations)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Natural Gas Combustion	Emp	0.04	0.05	0.06	0.06	0.07	0.08
Landfill Biodegradation (15 landfills)	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Livestock Waste Volatilization	Ag	0.00	0.00	0.00	0.00	0.00	0.00
Open Burning (15,802 tons in 1990)	None	0.00	0.00	0.00	0.00	0.00	0.00
Residential Natural Gas Combustion	HU	0.09	0.13	0.15	0.18	0.20	0.22
Residential Wood Combustion	HU	0.00	0.00	0.00	0.00	0.00	0.00
Area Source Totals:		0.45	0.58	0.65	0.74	0.85	0.92
Stationary Source Totals:		51.51	51.81	52.23	52.37	52.51	52.62

#### Notes:

Stationary sources are defined as those point and area sources under MDAQMD jurisdiction

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

# Mojave Desert AQMD

## ADP NOx Inventory Forecast Summary

### Mobile and Miscellaneous Area Sources

Source Category	Growth	(tons per os day)					
		1990	1996	1999	2002	2005	2007
On-Road HD Diesel Trucks	On-Road	12.77	12.98	12.28	12.72	13.75	14.43
On-Road HD Gasoline Trucks	On-Road	3.89	3.42	3.01	2.83	2.78	2.74
On-Road LD Trucks	On-Road	2.99	2.12	2.10	2.04	1.97	1.92
On-Road MD Trucks	On-Road	1.38	1.32	1.29	1.37	1.51	1.60
On-Road LD Passenger Vehicles	On-Road	9.19	6.32	5.76	5.31	4.91	4.65
On-Road Motorcycles	On-Road	0.03	0.05	0.05	0.05	0.06	0.06
On-Road Totals:		30.27	26.20	24.49	24.32	24.98	25.40
Lawn & Garden Equipment	HU	0.00	0.00	0.00	0.00	0.00	0.00
Gasoline Recreational Boats	Pop	0.02	0.03	0.03	0.04	0.05	0.05
Off-Road Heavy Duty Farm Equipment	Ag	0.04	0.05	0.05	0.05	0.06	0.06
Off-Road Heavy Duty Non-Farm Equipment	Emp	5.31	6.69	7.38	8.39	9.56	10.30
Light Duty Industrial Equipment	Emp	0.04	0.05	0.06	0.06	0.07	0.08
Locomotive Operations	Rail	26.25	25.46	25.20	25.20	25.20	25.20
Off-Road Vehicles	Pop	0.04	0.06	0.07	0.08	0.09	0.10
Off-Road Motorcycles	Pop	0.01	0.01	0.02	0.02	0.02	0.02
Off-Road Totals:		31.71	32.35	32.81	33.84	35.05	35.81
Adhesives and Sealants	Emp	0.00	0.00	0.00	0.00	0.00	0.00
Automobile Fires	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	Pop	0.00	0.00	0.00	0.00	0.00	0.00
Truck Transport Refrigerators	Emp	0.08	0.10	0.11	0.13	0.14	0.16
Unplanned Fires	None	0.08	0.08	0.08	0.08	0.08	0.08
Miscellaneous Area Totals:		0.16	0.18	0.19	0.21	0.22	0.24
Mobile and Misc. Area Source Totals:		62.14	58.73	57.49	58.37	60.25	61.45
Forecast NOx Totals:		113.65	110.55	109.72	110.74	112.76	114.07

**Notes:**

Mobile sources are defined as all on- and off-road mobile and area sources

All inventories include "fugitives," when available

0.00 indicates a value < 0.005 tons per day

This is an average ozone seasonal day inventory

## MDAQMD Growth Codes

Growth Parameter	Source	1990	1996	1999	2000	2002	2005	2007	2010	2015
Asphalt/Concrete Batch Plants	District	1.00	1.08	1.17		1.05	1.13	1.18	1.26	1.40
Cement Manufacturing	District	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Coating Operations	District	1.00	2.00	2.42		2.55	2.69	2.78	2.91	3.13
Composite Fabric/Fiberglass	District	1.00	30.82	33.82		36.82	39.82	41.82	44.82	49.82
Electric Utilities and Generators	District	1.00	1.01	1.01		1.01	1.01	1.01	1.01	1.01
General Aviation	District	1.00	1.17	1.27		1.38	1.51	1.60	1.74	1.97
Glass Manufacturing	District	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Military Bases	District	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Mining/Mineral Processing	District	1.00	1.02	1.02		1.00	0.93	0.93	0.94	0.94
Natural Gas Pipelines	District	1.00	1.00	1.02		1.02	1.02	1.02	1.02	1.02
Petroleum Pipelines/Terminals	District	1.00	1.19	1.44		1.66	1.87	2.02	2.24	2.60
Agricultural Activity	CARB	1.00	1.17	1.29		1.36	1.45	1.52	1.61	1.77
Railroad Activity	CARB	1.00	0.97	0.96		0.96	0.96	0.96	0.96	0.96
Housing Units	SCAG	64956			113262				179341	212380
Housing Units Factor	SCAG	1.00	1.45	1.67	1.74	1.95	2.25	2.46	2.76	3.27
Population	SCAG	192675			337723				532952	631135
Population Factor	SCAG	1.00	1.45	1.68	1.75	1.96	2.26	2.46	2.77	3.28
Industrial/Commercial Employment	SCAG	52224			74860				112853	128739
Ind/Comm Employment Factor	SCAG	1.00	1.26	1.39	1.43	1.58	1.80	1.94	2.16	2.47

**Notes:**

SCAG data are for Victor Valley DTIM modeling domain (Wang 7/13/94)  
 SCAG data are considered surrogates for nonattainment area and entire MDAQMD  
 District data are derived from survey of District industry (1994)  
 (High "coating operations" and "fiberglass" factors are due to post-1990 new sources)

**APPENDIX B**

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**CONTROL MEASURES**

# Control Measures

## I. INTRODUCTION

This document discusses the ADP's control and contingency measures. It identifies control methods, control technologies, costs, emission reductions, and justifications for each control measure. These measures are presented as actions that will generate VOC and NO<sub>x</sub> emission reductions to bring the federal ozone nonattainment area into attainment of the ozone NAAQS. Appendix A contains detailed emission inventory information that supports inventory and forecast estimates.

## II. CONTROL MEASURES

### A. District Measures

The District has identified and/or adopted control measures that can achieve VOC and NO<sub>x</sub> emission reductions from several categories. Rule effectiveness has been calculated for each control measure, or the default value of 80 percent is used.

#### Rule 461 - Gasoline Transfer and Dispensing (District Adopted Rule)

The District adopted Rule 461 - Gasoline Transfer and Dispensing, on December 19, 1988. Rule 461 requires the use of CARB-certified equipment (known as Phase II vapor control) to reduce vapor displacement VOC emissions by up to 95 percent. The District determined that approximately 56 percent of the gasoline service station throughput was controlled by Phase II equipment in 1990. The District forecasts that the remaining gasoline service stations installed Phase II equipment after 1990. This rule is achieving 82 percent control efficiency with 96.5 percent rule effectiveness.

Phase II vapor recovery systems collect the gasoline vapors that are displaced out of vehicle fuel tanks with a sealing, or close-fitting, vapor recovery nozzle. These vapors are returned to the gasoline storage tank through the vapor recovery nozzle bellows and connected vapor return plumbing. The volume of vapors returned to the storage tank replaces the volume of liquid withdrawn. This covers the surface of the liquid gasoline in the storage tank and retards future evaporation. No additional costs will be incurred from implementing this rule (Source: CARB Gasoline Marketing and Distribution Compliance Assistance Program, Phase I & II Gasoline Facilities, March 1991).

1990	1996	1999	2002	2005	2007
<b>VOC Emissions from affected source:</b>					
3.26	4.73	5.48	6.39	7.37	8.02
<b>VOC Emission reductions at 82 percent control efficiency:</b>					
	3.88	4.49	5.24	6.04	6.58
<b>Creditable VOC emission reductions at 96.5 percent rule effectiveness:</b>					
	3.74	4.33	5.05	5.82	6.34

1103 - Asphalt Paving Applications (District Proposed Rule)

The District proposes to adopt Rule 1103 - Cutback and Emulsified Asphalt to obtain VOC emission reductions from VOC content limits and operational requirements on asphalt and related materials. Rule 1103 will prohibit the use of rapid and medium cure asphalt during the ozone season, place a VOC volume limit on slow cure asphalt, and place a VOC volume limit of emulsified asphalt.

The District expects Rule 1103 to have a minimal impact on asphalt paving operations. The majority of asphalt products presently used meet the VOC volume requirements. Some minor medium cure asphalt activity will be shifted out of the ozone season. Rule 1103 is not expected to have any fiscal impact on industry.

Shifting medium cure (cutback) asphalt paving activity out of the ozone season represents a 2 percent control efficiency.

1990	1996	1999	2002	2005	2007
<b>VOC Emissions from affected source:</b>					
0.77	0.97	1.07	1.22	1.39	1.49
<b>VOC Emission reductions at 4 percent control efficiency:</b>					
	0.04	0.04	0.05	0.06	0.06
<b>Creditable VOC emission reductions at 80 percent rule effectiveness:</b>					
	0.03	0.03	0.04	0.05	0.05

Rule 1113 - Architectural Coatings and Thinners (District Adopted Rule)

The District adopted Rule 1113 - Architectural Coatings, on November 2, 1992. This rule required the use of reformulated coating with reduced VOC content beginning on March 1, 1993. The District determined that these reformulations will achieve an overall 13 percent VOC reduction from the 1996 and later architectural coatings and related emissions.

Examples of reformulations include reducing the VOC content of bond breakers from 750 grams per liter (gpl) to 350 gpl; high temperature coatings from 650 gpl to 550 gpl; and traffic paints from 415 gpl to 250 gpl. No additional costs will be incurred from implementing and taking credit for this Rule (SCAQMD Rule 1113 Staff Report, District Rule 1113 Staff Report).

1990	1996	1999	2002	2005	2007
<b>VOC Emissions from affected source:</b>					
5.14	7.45	8.58	10.02	11.57	12.64

<b>VOC Emission reductions at 13 percent control efficiency:</b>					
	0.97	1.12	1.30	1.50	1.64

<b>Creditable VOC emission reductions at 95 percent rule effectiveness:</b>					
	0.92	1.06	1.24	1.43	1.56

The District has verified a rule effectiveness of at least 95% using compliance testing.

Rule 1157 - Boilers and Process Heaters (District Proposed Rule)

The District proposes to adopt Rule 1157 - Boilers and Process Heaters to obtain NO<sub>x</sub> emission reductions from controls on boilers and process heaters. Rule 1157 will apply to new and existing boilers, steam generators, and process heaters within the federal ozone nonattainment area, excluding permit units directly regulated by the Public Utilities Commission and used to generate steam for electrical power generating equipment. Rule 1157 will establish BARCT NO<sub>x</sub> emission rate limits for existing large (five tpd or 250 tpy) permit units and RACT NO<sub>x</sub> emission rate limits for all other major permit units. Rule 1157 will require annual tune-ups and establish operational requirements for smaller permit units (annual heat inputs less than 214,000 MMBtu of gaseous fuel or 83,000 MMBtu of liquid/solid fuel).

It is anticipated that one facility will be required to retrofit its boilers as a result of Rule 1157. The expected retrofit will involve low NO<sub>x</sub> burners, generating at least a 50 percent emission reduction. The cost-effectiveness of this control technology is estimated to range from \$599 to \$28,694 per ton of NO<sub>x</sub> reduced (District Rule 1157 Staff Report).

Low NO<sub>x</sub> burners employ low excess air combustion, air staging, fuel staging, or combustion product recirculation to reduce NO<sub>x</sub> emissions. Low excess air combustion and combustion product recirculation decrease the oxygen available for NO<sub>x</sub> formation. Staged air burners lower available oxygen at points in the combustion chamber where the temperature is high. Staged fuel burners lower the temperature at points in the combustion chamber where available oxygen is high. Low NO<sub>x</sub> burners typically achieve 50 to 60 percent NO<sub>x</sub> emission reductions.

1990	1996	1999	2002	2005	2007
<b>NO<sub>x</sub> emissions from affected source:</b>					
0.11	0.11	0.11	0.11	0.11	0.11

**NO<sub>x</sub> emission reductions at 50 percent control efficiency:**  
 0.06                      0.06                      0.06                      0.06

**Creditable NO<sub>x</sub> emission reductions at 80 percent rule effectiveness:**  
 0.04                      0.04                      0.04                      0.04

Rule 1158 - Electric Power Generation (District Proposed Rule)

The District proposes to adopt Rule 1158 - Electric Power Generators to obtain NO<sub>x</sub> emission reductions from electric utility equipment. Rule 1158 will require combustion modifications, flue gas treatment, and alternative fuels.

1990	1996	1999	2002	2005	2007
<b>NO<sub>x</sub> emissions from affected source:</b>					
4.41	4.45	4.45	4.45	4.45	4.45

**NO<sub>x</sub> emission reductions at 7.5 percent control efficiency (4% in 1999):**  
 0.18                      0.33                      0.33                      0.33

**Creditable NO<sub>x</sub> emission reductions at 80 percent rule effectiveness:**  
 0.13                      0.25                      0.25                      0.25

Rule 1159 - Gas Turbines (District Proposed Rule)

The District proposes to adopt Rule 1159 - Gas Turbines to obtain NO<sub>x</sub> emission reductions from commercial, industrial and institutional gas turbines. Rule 1159 will apply to gas fired turbines of 0.3 megawatts and larger within the federal ozone nonattainment area. Rule 1159 will establish NO<sub>x</sub> emission compliance limits for gas turbines based on size, fuel type and operating characteristics.

1990	1996	1999	2002	2005	2007
<b>NO<sub>x</sub> emissions from affected source:</b>					
4.41	4.45	4.45	4.45	4.45	4.45

**NO<sub>x</sub> emission reductions at 7.5 percent control efficiency (4% in 1999):**  
 0.18                      0.33                      0.33                      0.33

**Creditable NO<sub>x</sub> emission reductions at 80 percent rule effectiveness:**  
 0.13                      0.27                      0.27                      0.27

Rule 1160 - Internal Combustion Engines (District Proposed Rule Revision)

The District proposes to revise Rule 1160 - Internal Combustion Engines to obtain VOC emission reductions from large internal combustion engines. Revised Rule 1160 will apply to any stationary internal combustion engine rated at 250 or more brake horsepower within the federal ozone nonattainment area. Rule 1160 will require engine modifications to meet NO<sub>x</sub> and VOC emission limits based on engine type and fuel.

The District expects "clean-burn" or lean burn turbocharger retrofits to be used to reduce NO<sub>x</sub> and VOC emissions. The cost-effectiveness of these retrofits ranges from \$1,900 to \$35,000 per ton of NO<sub>x</sub> reduced, varying widely and based on engine size and combustion type.

Lean burn retrofits can reduce VOC and NO<sub>x</sub> emissions by as much as 80 percent. Lean burn retrofits reduce emissions by increasing IC engine combustion chamber air/fuel ratios. This is achieved by replacing the turbocharger, inter-coolers, cylinder heads, gas ignitors, power pistons, cylinder liners, and engine control systems, and retarding the engine ignition timing.

	1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected source:</b>						
	1.25	1.25	1.25	1.25	1.25	1.25
<b>NO<sub>x</sub> emissions from affected source:</b>						
	13.84	13.84	13.84	13.84	13.84	13.84
<b>VOC emission reductions at 50 percent control efficiency (18% in 1996):</b>						
	0.23	0.65	0.65	0.65	0.65	0.65
<b>NO<sub>x</sub> emission reductions at 80 percent control efficiency (44% in 1996):</b>						
	6.08	11.13	11.13	11.13	11.13	11.13
<b>Creditable VOC emission reductions at 80 percent rule effectiveness:</b>						
	0.18	0.52	0.52	0.52	0.52	0.52
<b>Creditable NO<sub>x</sub> emission reductions at 80 percent rule effectiveness:</b>						
	4.86	8.90	8.90	8.90	8.90	8.90

## B. California Air Resources Board (CARB) Measures

CARB has identified and/or adopted control measures that can achieve VOC and NO<sub>x</sub> emission reductions from several categories. Rule effectiveness has been accounted for in the control efficiencies used by CARB. For details on each State program, please refer to "The Proposed 1994 California State Implementation Plan For Ozone, Volumes II and III" (CARB, release date October 7, 1994).

### Consumer Products Standards

The District is taking credit for VOC reductions resulting from the State Consumer Products Program. This program sets stringent VOC content limits on a wide range of consumer products, and requires new products to comply with these standards beginning on January 1, 1993, with additional standards phased in through January 1, 1998. This CARB program is intended to reduce VOC emissions by at least 13 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected source:</b>					
2.33	3.38	3.91	4.57	5.27	5.73
<b>VOC emission reductions at 13 percent control efficiency:</b>					
		0.51	0.59	0.69	0.74

### Pesticide Standards

The District is taking credit for VOC reductions resulting from State-wide formulation and use restrictions on pesticides. This control measure is intended to reduce VOC emissions by at least 20 percent.

1990	1996	1999	2002	2005	2007
<b>VOC Emissions from affected source:</b>					
1.51	1.77	1.95	2.05	2.19	2.30
<b>VOC Emission reductions at 20 percent control efficiency:</b>					
				0.44	0.46

### Lawn and Garden Equipment Exhaust Standards

The District is taking credit for VOC and NO<sub>x</sub> reductions resulting from State-wide emission standards for lawn and garden utility equipment. This program is intended to reduce VOC emissions by at most 83 percent, but increases NO<sub>x</sub> emissions by up to 77 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected source:</b>					
0.22	0.32	0.37	0.43	0.50	0.54
<b>NO<sub>x</sub> emissions from affected source:</b>					
0.01	0.01	0.01	0.01	0.01	0.01

**VOC emission reductions at 83 percent control efficiency (56% in 1999, 67% in 2002, 76% in 2005):**

	0.21	0.29	0.38	0.45
<b>NO<sub>x</sub> emission increases at 34 percent control efficiency (77% in 1999, 74% in 2002, 50% in 2005):</b>				
	-0.01	-0.01	-0.01	0.00

#### Light Duty Industrial Equipment Exhaust Standards

The District is taking credit for VOC and NO<sub>x</sub> reductions resulting from State-wide exhaust emission standards from light duty industrial equipment (gasoline, diesel and LPG fueled). This program is intended to reduce VOC emissions by up to 66 percent, and NO<sub>x</sub> emissions by up to 61 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected sources:</b>					
0.07	0.09	0.10	0.11	0.13	0.14
<b>NO<sub>x</sub> emissions from affected sources:</b>					
0.04	0.06	0.06	0.06	0.07	0.08

**VOC emission reductions at 66 percent control efficiency (51% in 2005):**

	0.10	0.13
<b>NO<sub>x</sub> emission increases at 61 percent control efficiency (49% in 2005):</b>		
	0.07	0.08

#### Off-Road Heavy Duty Equipment Exhaust Standards (Farm and Non-farm)

The District is taking credit for VOC and NO<sub>x</sub> reductions resulting from State-wide off-road heavy duty equipment exhaust standards (farm and non-farm equipment). This program sets stringent off-road heavy duty equipment engine emission standards, and requires new equipment to comply with these standards. This measure is intended to reduce VOC emissions by up to 36 percent and NO<sub>x</sub> emissions by up to 59 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected sources:</b>					
0.50	0.63	0.69	0.78	0.89	0.97

**NO<sub>x</sub> emissions from affected sources:**

4.90	6.18	6.81	7.74	8.82	9.50
------	------	------	------	------	------

**VOC emission reductions at 36 percent control efficiency (28% in 2002):**

0.25	0.35
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**NO<sub>x</sub> emission reductions at 59 percent control efficiency (20% in 1999, 35% 2002, 49% in 2005):**

1.36	2.70	4.31	5.60
------	------	------	------

**Aircraft**

The District is taking credit for VOC reductions resulting from State-wide aircraft exhaust standards. This program sets reduced aircraft engine exhaust emission standards, and requires new engines to comply with these standards. This measure is intended to reduce VOC emissions by up to 8 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected sources:</b>					
0.07	0.08	0.09	0.10	0.11	0.11

**VOC emission reductions at 8 percent control efficiency (4% in 2002):**

0.00	0.01
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**Off-Road Recreational Vehicles (Motorcycles and ATVs)**

The District is taking credit for VOC reductions resulting from State-wide off-road recreational vehicle engine emission standards. This control measure is intended to reduce VOC emissions from off-road recreational vehicles by up to 84 percent.

1990	1996	1999	2002	2005	2007
<b>VOC Emissions from affected source:</b>					
0.45	0.65	0.75	0.88	1.01	1.11

**VOC Emission reductions at 84 percent control efficiency (51% in 1999, 67% in 2002):**

0.38	0.59	0.85	0.93
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**Recreational Gasoline Boat Standards**

The District is taking credit for VOC reductions resulting from State-wide engine exhaust emission standards for recreational gasoline boats. This control measure is intended to reduce VOC emissions by up to 29 percent.



### III. CONTINGENCY MEASURES

#### A. Mobile Sources

ARB and EPA have regulatory authority for control of mobile source emissions. The District can take credit for emissions reductions from State and Federal programs. The District has identified a State program that can achieve additional emissions reductions.

#### CARB Enhanced Inspection and Maintenance (State Measure)

The District proposes to take emissions reductions credit from the State Enhanced I&M Program. Currently, this program and the Federal Enhanced I&M program are centered in legal controversy, as well as technical controversy. It is anticipated that by 1996 issues surrounding "Enhanced I&M" will be resolved. The District proposes the State's version of Enhanced I&M as a contingency measure. This program is estimated to reduce VOC emissions by 14 percent and NO<sub>x</sub> emissions by 8 percent.

1990	1996	1999	2002	2005	2007
<b>VOC emissions from affected source:</b>					
20.43	10.87	9.69	9.60	10.08	10.39
<b>NO<sub>x</sub> emissions from affected source:</b>					
13.56	9.76	9.15	8.72	8.39	8.17
<b>VOC emission reductions at 14 percent control efficiency:</b>					
	1.52	1.36	1.34	1.41	1.45
<b>NO<sub>x</sub> emission reductions at 8 percent control efficiency:</b>					
	0.78	0.73	0.70	0.67	0.65
<b>Creditable VOC emission reductions as a CARB program:</b>					
	1.52	1.36	1.34	1.41	1.45
<b>Creditable NO<sub>x</sub> emission reductions as a CARB program:</b>					
	0.78	0.73	0.70	0.67	0.65

**Mojave Desert AQMD**  
**ADP Emission Reduction Summary**  
**Average Ozone Seasonal Day**

<b>VOC Reduction Measures</b>	<b>Agency</b>	<b>1999</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>
District Rule 461 - Gasoline Transfer and Dispensing	AQMD	4.34	5.06	5.83	6.35
District Rule 1103 - Cutback and Emulsified Asphalt	AQMD	0.03	0.04	0.04	0.05
District Rule 1113 - Architectural Coatings	AQMD	1.06	1.24	1.43	1.56
District Rule 1160 - Internal Combustion Engines	AQMD	0.50	0.50	0.50	0.50
Consumer Products Standards	CARB	0.51	0.59	0.69	0.74
Lawn & Garden Equipment Standards	CARB	0.21	0.29	0.38	0.45
Light Duty Industrial Equipment Standards	CARB	0.00	0.00	0.06	0.09
Off-Road Heavy Duty Equipment Standards	CARB	0.00	0.00	0.25	0.35
Aircraft Standards	CARB	0.00	0.00	0.00	0.01
Off-Road Recreational Vehicles	CARB	0.38	0.59	0.85	0.93
Recreational Gasoline Boat Standards	CARB	0.00	0.00	0.07	0.11
On-Road Vehicle Standards	CARB	0.89	1.12	1.42	1.87
Pesticide Standards and Limits	CARB	0.00	0.00	0.44	0.46
<b>Total Feasible VOC Reductions:</b>		<b>7.92</b>	<b>9.43</b>	<b>11.96</b>	<b>13.47</b>
<b>Required VOC Reductions</b>		<b>12.94</b>	<b>19.89</b>	<b>27.37</b>	<b>32.43</b>
<b>VOC Shortfall</b>		<b>5.02</b>	<b>10.46</b>	<b>15.41</b>	<b>18.96</b>
<b>NOx Reduction Measures</b>	<b>Agency</b>	<b>1999</b>	<b>2002</b>	<b>2005</b>	<b>2007</b>
District Rule 1157 - Boilers and Process Heaters	AQMD	0.04	0.04	0.04	0.04
District Rule 1158 - Electric Utility Boilers	AQMD	0.14	0.27	0.27	0.27
District Rule 1159 - Gas Turbines	AQMD	0.14	0.27	0.27	0.27
District Rule 1160- Internal Combustion Engines	AQMD	8.86	8.86	8.86	8.86
Locomotive Standards	CARB	3.78	7.31	10.58	10.84
Lawn & Garden Equipment Standards	CARB	-0.01	-0.01	-0.01	0.00
Industrial Equipment Standards	CARB	1.36	2.70	4.35	5.64
On-Road Vehicle Standards	CARB	1.46	2.50	5.11	7.74
<b>Total Feasible NOx Reductions:</b>		<b>15.77</b>	<b>21.94</b>	<b>29.47</b>	<b>33.66</b>
<b>Required NOx Reductions</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1.83</b>
<b>Available NOx Reductions</b>		<b>15.77</b>	<b>21.94</b>	<b>29.47</b>	<b>31.83</b>
<b>Equivalent VOC Reductions</b>		<b>5.83</b>	<b>8.12</b>	<b>10.90</b>	<b>12.12</b>
<b>VOC Shortfall</b>		<b>0.00</b>	<b>2.34</b>	<b>4.51</b>	<b>6.84</b>

