CHAPTER 1
INTRODUCTION

Purpose

Constraints in Achieving Standards

Control Efforts

Progress in Implementing the 1997/1999 SIPs

2003 AQMP Revision

Format of This Document

PURPOSE

The South Coast Air Quality Management District (District) amended the 1997 Air Quality Management Plan (AQMP) in 1999 to address the U.S. Environmental Protection Agency's (U.S. EPA's) proposed disapproval of the 1997 Ozone SIP revision to ensure that the 1997 AQMP complied with or exceeded federal requirements. The 1999 AQMP amendments to the 1997 AQMP were subsequently approved by the U.S. EPA into the State Implementation Plan (SIP) in April 2000. The District updated the PM10 portion of the 1997 AQMP for both the South Coast Air Basin and Coachella Valley in 2002 as part of the District's request to extend the PM10 attainment date from 2001 to 2006 for these areas as allowed under the federal Clean Air Act (CAA). The U.S. EPA approved the 2002 update on April 18, 2003.

The purpose of the 2003 Revision to the Air Quality Management Plan (AQMP or Plan) for the South Coast Air Basin (Basin) and those portions of the Salton Sea Air Basin under District jurisdiction, is to set forth a comprehensive program that will lead these areas into compliance with all federal and state air quality planning requirements. Specifically, the 2003 AQMP Revision is designed to satisfy the California Clean Air Act (CCAA) tri-annual update requirements and fulfill the District's commitment to update transportation emission budgets based on the latest approved motor vehicle emissions model and planning assumptions. The Plan will be submitted to U.S. EPA as a SIP revision once it is approved by the District Governing Board and the California Air Resources Board (CARB). The key federal and state planning requirements are summarized briefly later in this chapter.

The 2003 AQMP sets forth programs which require the cooperation of all levels of government: local, regional, state, and federal. Each level is represented in the Plan by the appropriate agency or jurisdiction that has the authority over specific emissions sources. Accordingly, each agency or jurisdiction is associated with specific planning and implementation responsibilities.

At the federal level, the U.S. Environmental Protection Agency (U.S. EPA) is charged with regulation of 49-state on-road motor vehicle standards; trains, airplanes, and ships; and non-road engines less than 175 horsepower. The CARB, representing the state level, also oversees on-road vehicle emission standards, fuel specifications, some off-road sources and consumer product standards. At the regional level, the District is responsible for stationary sources and some mobile sources. In addition, the District has lead responsibility for the development and adoption of the Plan. Lastly, at the local level, Associations of Governments have a dual role of leader and coordinator. In their leadership role, they, in cooperation with local jurisdictions and subregional associations, develop strategies for these jurisdictions to implement; as a coordinator, they facilitate the implementation of these strategies. For the South Coast Air Basin, the

Southern California Association of Governments is the District's major partner in the preparation of the AQMP. Interagency commitment and cooperation are the keys to success of the AQMP.

Since air pollution physically transcends city and county boundaries, it is a regional problem. No one agency can design or implement the Plan alone and the strategies in the Plan reflect this fact.

CONSTRAINTS IN ACHIEVING STANDARDS

The District is faced with a number of constraints or confounding circumstances to achieving clean air. These include the physical and meteorological setting, the large pollutant emissions burden of the Basin, and the rapid population growth of the area.

Setting

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Basin) (Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The Basin, which is a subregion of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east. The Los Angeles County Portion of the MDAB (known as north county or Antelope Valley) is bounded by the San Gabriel Mountains to the south and west, the Los Angeles/Kern county border to the north, and the Los Angeles/San Bernardino county border to the east. The SSAB and MDAB were previously included in a single large Basin called the Southeast Desert Air Basin (SEDAB). On May 30, 1996, the California Air Resources Board replaced the SEDAB with the SSAB and MDAB. In July 1997, the Antelope Valley area of MDAB was separated from the District and incorporated into a new air district under the jurisdiction of the newly formed Antelope Valley Air Pollution Control District (AVAPCD). The entire region is shown in Figure 1-1.

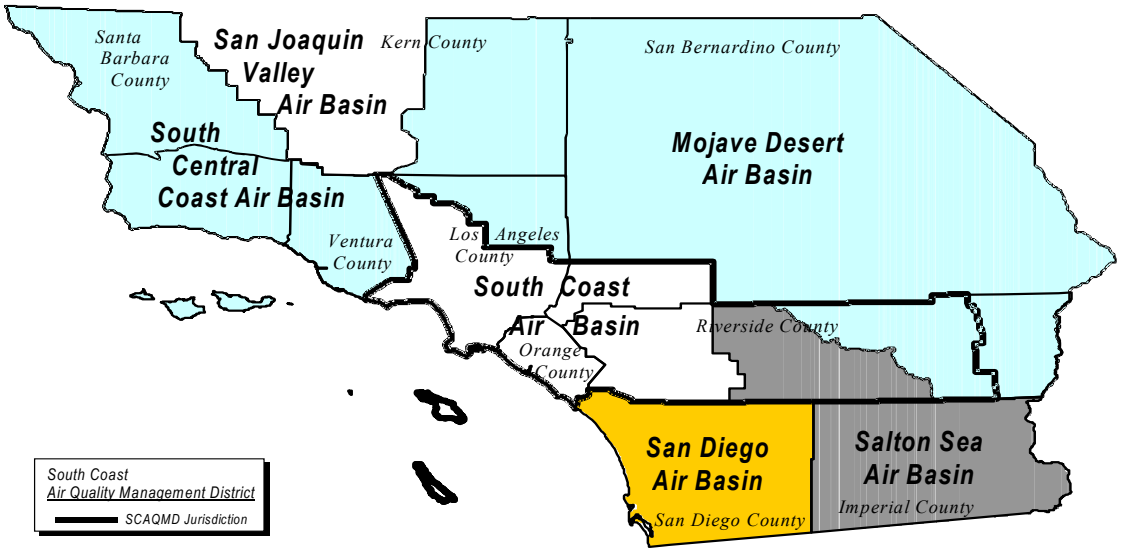

FIGURE 1-1

Boundaries of the South Coast Air Quality Management District
and Federal Planning Areas

The topography and climate of Southern California combine to make the Basin an area of high air pollution potential, and constrain the District's efforts to achieve clean air. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cool marine layer and inhibits the pollutants in the marine layer from dispersing upward. In addition, light winds during the summer further limit ventilation. Furthermore, sunlight triggers the photochemical reactions which produce ozone, and this region experiences more days of sunlight than any other major urban area in the nation except Phoenix.

The Basin's economic base is diverse. Historically, the four counties of the Basin have collectively comprised one of the fastest-growing local economies in the United States. Significant changes have occurred in the composition of the industrial base of the region in the past twenty years. As in many areas of the country, a large segment of heavy manufacturing, including steel and tire manufacturing and automobile assembly, has been phased down. Small service industries and businesses resulting from growth in shipping and trade have replaced much of the heavy industry.

The Coachella Valley Planning Area is impacted by pollutant transport from the South Coast Air Basin. In addition, pollutant transport occurs to the Antelope Valley, Mojave Desert, Ventura county, and San Diego county. As part of this AQMP revision, transport issues relative to the Coachella Valley Planning Area are specifically addressed in Chapter 8 and Appendix V.

In summary, the diverse geographical characteristics of the Southern California region place a significant constraint on achieving air quality standards.

Emission Sources

The pollution burden of the Basin is substantial. In spite of substantial reductions already achieved, additional significant reductions of volatile organic compounds and oxides of nitrogen in the South Coast Air Basin are needed to attain the federal air quality standards.

Air pollution forms either directly or indirectly from pollutants emitted from a variety of sources. These sources can be natural, such as oil seeps, vegetation, or windblown dust. Emissions may also result from combustion, as in automobile engines; from evaporation of organic liquids, such as those used in coating and cleaning processes; or through abrasion, such as from tires on roadways. The air pollution control strategy in the AQMP is directed almost entirely at controlling man-made sources. Natural emissions are accounted for in the background and initial conditions for the air quality modeling analysis described in Chapters 5 and 8 and Appendix V.

Population

Since the end of World War II, the Basin has experienced faster population growth than the rest of the nation. Although growth has slowed somewhat, the region's population is expected to increase significantly through 2020. Table 1-1 shows the projected growth based on SCAG's regional growth forecast.

Although per-capita emissions have been brought down substantially in the Basin through 50 years of implementing pollution controls, increases in the population over that time have made overall emission reductions more difficult. Many sources, such as automobiles, have been significantly controlled. However, increases in the number of sources, particularly those growing proportionally to population, reduce the potential air quality benefits of new controls. The net result is that unless significant steps are taken to further control air pollution, growth will overwhelm much of the improvements expected from the existing control program.

TABLE 1-1

Population Growth

Year	Population	Average Percent Increase Per Year Over the Period
1950	4.8 million	--
1980	10.5 million	4.0
1990	13.0 million	2.4
2000	14.8 million	1.4
2010	16.6 million	1.2
2020	18.2 million	1.0
2025	19.2 million	1.0

CONTROL EFFORTS

History

The seriousness of the local air pollution problem was recognized in the early 1940s. In 1946, the Los Angeles County Board of Supervisors established the first air pollution control district in the nation to address the problems of industrial air pollution. In the mid-1950s, California established the first state agency to control motor vehicle emissions. Countywide or regional air pollution districts were required throughout the state by 1970. Many of the controls, originating in California, became the basis for the federal control program which began in the 1960s.

Nearly all control programs developed to date have relied on the development and application of cleaner technologies and add-on emission control devices. Industrial and vehicular sources have been significantly affected by these technologies. Only recently have preventive efforts come to the forefront of the air pollution control program, (e.g., alternative materials, waste minimization, and maintenance procedures for industrial sources).

In the 1970s, it became apparent at both the state and federal levels that local programs were not enough to solve a problem that was regional in nature and did not stay within jurisdictional boundaries. Instead, air basins, defined by geographical boundaries, became the basis for regulatory programs.

In 1976, the California Legislature adopted the Lewis Air Quality Management Act which created the South Coast Air Quality Management District from a voluntary association of air pollution control districts in Los Angeles, Orange, Riverside, and San Bernardino counties. The new agency was charged with developing uniform plans and programs for the region to attain federal standards by the dates specified in federal law. The agency was also mandated to meet state standards by the earliest date achievable, using reasonably available control measures.

Rule development in the 1970s through 1990s resulted in dramatic improvement in Basin air quality (see Appendix II). However, the effort to impose incremental rule changes on the thousands of stationary sources through the command-and-control regulatory process had its limitations in economic efficiency. The 1991 AQMP introduced the concept of a Marketable Permits Program and outlined the framework of an idea that was forerunner to what is now known as the Regional Clean Air Incentives Market (RECLAIM).

A historical milestone occurred with the adoption of RECLAIM on October 15, 1993. RECLAIM is an alternative means of achieving further emission reductions from stationary sources, different from the traditional source-specific regulatory program. RECLAIM, a cap and trade program, calls for declining mass emission limits on the total emissions from all sources within a facility. The facility can choose from a selection of methods for achieving the prescribed emission reductions: add-on controls, use of reformulated products, changes in production, purchase of excess emission reductions from other sources, and/or any other methods that would be enforceable and quantifiable.

Since the introduction of the RECLAIM program, the District has committed to provide compliance flexibility and has developed various economic incentive programs to ensure maximum feasible reductions while reducing compliance costs. For example, in 2001, the AQMD Governing Board adopted six mobile and area source pilot credit generation rules. NOx emission reductions generated from these pilot credit generation rules can be used in the RECLAIM program.

In summary, while the District's effort to achieve applicable ambient air quality standards continues to rely on the successful command-and-control regulatory structure, the strategy is supplemented where appropriate with market incentive and compliance flexibility strategies.

Impact of Control

Past air quality programs have been effective in improving the Basin's air quality. Ozone levels have been reduced by half over the past 30 years, nitrogen dioxide, sulfur dioxide, and lead standards have been met, and other criteria pollutant concentrations

have significantly declined. The federal and state CO standards were also met as of the end of 2002. However, the Basin still experiences exceedances of health-based standards for ozone and particulate matter under ten microns in size (PM10). Air quality summaries and health effects in the Basin are briefly discussed in Chapter 2; Appendix II provides an in-depth analysis of air quality as measured within the District's jurisdiction. The new federal 8-hour ozone and PM2.5 air quality standards and the state annual PM2.5 standards, although not yet applicable for the purpose of the AQMP, are discussed in Chapter 10.

PROGRESS IN IMPLEMENTING THE 1997/1999 SIPs

Progress in implementing the 1997/1999 SIPs can be measured by the number of control measures that have been adopted as rules and the resulting tons of pollutants targeted for reduction. Emission reduction commitments and reductions achieved in 2010 are based on the emissions inventory from the 1997 SIP. Since October 1999, sixteen control measures or rules have been adopted or amended by the District through October 2002. Table 1-2 lists the District's 1997/1999 SIP commitment and the control measures or rules that were adopted through October 2002. The primary focus of the District's efforts had been the adoption and implementation of VOC control measures. As shown in Table 1-2, for the control measures adopted by the District, the District has achieved 158 tons per day VOC reductions, exceeding its 1997/1999 SIP commitment by approximately 44.5 tons per day.

Table 1-3 lists the control measures committed to in the 1997/1999 SIPs that have been adopted by the U.S. EPA or CARB since 1995. To date, CARB committed to VOC and NOx emission reductions of approximately 90 and 106 tons per day, respectively, and achieved 67 and 140 tons per day, respectively. While exceeding its NOx target by 34 tons per day, CARB fell short of the VOC target by 21 tons per day using the 1997 SIP currency. U.S. EPA was obligated to VOC and NOx emission reductions of approximately 35 and 75 tons per day, respectively, and achieved 38 and 63 tons per day, respectively.

TABLE 1-2

Rules and Regulations Adopted by District Since Adoption of 1997/1999 SIPs
(October 1996 through October 2002[a])

Control Measure (Rule)	Title	SIP Commitment (tons/day)	Emission Reductions Achieved Through Rule Implementation (tons/day)	Adoption Date
CTS-02C(P2) (Rule 1171)	Solvent Cleaning Operations (VOC)	11.0	11.0[b]	1999
WST-04 (Rule 1150.1)[g]	Disposal of VOC-Containing Materials (VOC)	0.8	0.8	2000
PRC-3(P2) (Rule 1138)[g]	Restaurant Operations (VOC)	0.9	c	c
CTS-020 (Rule 442)[g]	Solvent Usage (VOC)	1.0	1.9	2000
CTS-02E (Rule 1168)[g]	Adhesives (VOC)	1.3	8.3	2000
RFL-02(P2) (Rule 461)[g]	Gasoline Service Stations (VOC)	2.0	6.2	2000
CTS-09(P1) (Rule 1132)[g]	Large Coating & Solvent Sources – High Emitting Spray Booth Facilities (VOC)	4.0	5.4	2000
FUG-06 (Rule 1189)[g]	Hydrogen Plants (VOC)	0.8	1.6	2000
FUG-05(P1) (Rule 1178)	Large Fugitive Emissions Sources (VOC)	1.0	1.7	2001
PRC-06 (Rule 1131)[g]	Industrial Processes - Food Flavoring (VOC)	3.0	3.0	2001
CTS-08(P1) (Rule 1130)[g]	Industrial Coatings and Solvents (VOC)	2.0	1.9	2002

TABLE 1-2
(continued)
Rules and Regulations Adopted by District Since Adoption of 1997/1999 SIPs
(October 1996 through October 2002[a])

Control Measure (Rule)	Title	SIP Commitment (tons/day)	Emission Reductions Achieved Through Rule Implementation (tons/day)	Adoption Date
CTS-08(P2) (Rule 1122)	Solvent Degreasing (VOC)	3.0	6.2	2001
CTS-09(P2) (Rule 1162)	Polyester Resins (VOC)	3.0	1.6	2002
Rule 1102 [g]	Dry Cleaners Using Solvent Other than Perchloroethylene (VOC)	N/A	0.3	2000
Rule 1104 [g]	Wood Flat Stock Coating Operations (VOC)	N/A	0.1	1999
Rules adopted from October 1996 to September 1999 [d, h]		79.8	108.1	11/96 – 9/99
	Total VOC	**113.6**	**158.1**	
CMB-06 (Rule 1121) [g]	Control of Nitrogen Oxides from Residential-Type Natural Gas Fired Water Heaters (NOx)	7.6	7.6	1999
Rule 1146 [g]	Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (NOx)	N/A	0.2	2000
Rules adopted from October 1996 to September 1999 [d, h]		2.4	4.2	11/96 – 9/99
	Total NOx	**10**	**12**	

TABLE 1-2
(continued)
Rules and Regulations Adopted by District Since Adoption of 1997/1999 SIPs
(October 1996 through October 2002[a])

Control Measure (Rule)	Title	SIP Commitment (tons/day)	Emission Reductions Achieved Through Rule Implementation (tons/day)	Adoption Date
Rule 1158	Storage, Handling, and Transport of Petroleum Coke (PM10)	N/A	1	1999
Rule 431.2	Sulfur Content of Liquid Fuels (PM10) (SOx)	N/A	 0.1 [e] 0.4 [e]	2000
PRC-3(P1) (Rule 1138)	Control of Emissions from Restaurant Operations (PM10)	7.8	1	1997
PRC-01 (Rule 1137)	PM10 Emission Reductions from Woodworking Operations (PM10)	7.5[f]	7.5 [f]	2002
	PM10 **SOx**	**15.3**	**9.6** **0.4**	

[a] SCAQMD summer planning emission in 2010 (rounded to the nearest whole number), based on 1997 SIP inventory.
[b] An additional 16 tons of VOC emission reductions associated with implementation of Rule 1171 – Solvent Cleaning Operations are subject to technology assessments in 2003 and 2004 prior to implementation in 2005 and are not included in this value, but are included in the 2010 baseline.
[c] Board approved infeasibility findings in October 2000 and used excess reductions from RFL-02(P2) to meet the SIP commitment.
[d] Reference: Table 1-1 of the 1999 Amendment to the 1997 Ozone SIP for the South Coast Air Basin (SCAQMD, 1999).
[e] Emission reductions listed include only those from stationary sources.
[f] SIP commitment and emission reduction achieved are based on 1997 AQMP inventory methodology.
[g] Rules which have been approved by U.S. EPA. (Limited disapproval for portions of Rules 1168, 1132, and 1131 are being addressed in 2003/2004.)
[h] Rules from Table 1-1 of the 1999 Amendment to the 1997 Ozone SIP for the South Coast Air Basin (SCAQMD, 1999) which have been approved by U.S. EPA include: Rule 1107 (CTS-02H), Rule 1145 (CTS-02M), Rule 1122 (CTS-02N), Rule 1113(P1) (CTS-07), Rule 1146.2 (CMB-02B), Rule 1138 (PRC-03), and Rule 1104.

TABLE 1-3
State and Federal Measures Adopted Since 1994 SIP

			ROG (tpd)		NOx (tpd)	
Near-Term Measures	**Agency**	**Adopted**	**Commit-ment**	**Achieved in 2010**	**Commit-ment**	**Achieved in 2010**
M1: Light-duty vehicle scrappage	CARB	1998	19	0	17	0
M2: Low Emission Vehicle II program	CARB	1998		4		43
M3: Medium-duty vehicles	CARB	1995	Baseline[1]	--	Baseline[1]	-
M4: Incentives for clean engines (Moyer Program)	CARB	1999	9	0	62	3
M5: California heavy-duty diesel vehicle standards	CARB	1998		5		44
M6: National heavy-duty diesel vehicle standards	USEPA	1998		1		11
M7: Heavy-duty vehicle scrappage	CARB	Withdrawn		NA		NA
M17: In-use reductions from heavy-duty vehicles	CARB	No		0		0
M8: Heavy-duty gasoline vehicle standards	CARB	1995	Baseline[1]	-	Baseline[1]	-
M9: CA heavy-duty off-road diesel engine standards	CARB	2000	4	4	47	18
M10: National heavy-duty off-road diesel engine stds	USEPA	1998		6		25
M11: CA large off-road gas/LPG engine standards	CARB	1998	32	16	17	5
M12: National large off-road gas/LPG engine stds	USEPA	2002		14		5
M13: Marine vessel standards	USEPA	1999	0	0	15	2
M14: Locomotive engine standards[4]	USEPA	1997	0	0	17	17
M15: Aircraft standards	USEPA	No	3	0	6	0
M16: Marine pleasurecraft standards	USEPA	1996	21	17	0	0
CP2: Consumer products mid-term measures	CARB	1997/1999	34	15	0	0
CP3: Aerosol paint standards	CARB	1995/1998	Baseline[1]	--	--	--
Enhanced I/M (Smog Check II)	BAR	1995	Baseline[1]	(6)	Baseline[1]	-
DPR-1: Emission reductions from pesticides	DPR	Voluntary	1	1	0	0

TABLE 1-3 (CONTINUED)
State and Federal Measures Adopted Since 1994 SIP

	Agency	Adopted	ROG (tpd)		NOx (tpd)	
			Commit-ment	**Achieved in 2010**	**Commit-ment**	**Achieved in 2010**
Adopted measures not originally included in SIP						
Clean fuels measures	CARB	Multiple		13		12
Marine pleasurecraft (reductions beyond M16)	CARB	1998/2001		7		0
Motorcycle Standards	CARB	1998		1		0
Urban transit buses	CARB	2000		0		1
Enhanced vapor recovery program[5]	CARB	2000		6		0
Medium/heavy-duty gasoline standards (beyond M8)	CARB	2000		0		1
2007 heavy-duty diesel truck standards (beyond M5/M6)	CARB/ USEPA	2001		1		16
Small off-road engine standard revisions	CARB	1998		(1)		0
Gas can requirements[2]	*CARB*	*1999*		*30[2]*		*0*
NEAR-TERM TOTAL (excluding gas cans)			**125**	**105**	**181**	**203**
Long-Term Measures (Section 182(e)(5))						
Advanced technology on-road mobile "Black Box"	CARB	No	37	0	6	-[3]
Advanced technology off-road mobile "Black Box"	CARB	No	18	0	3	-[3]
CP4: Long-term measure for consumer products	CARB	No	43	0	0	0
LONG-TERM TOTAL			**98**	**0**	**9**	-[3]
GRAND TOTAL (near-term + long-term)			**223**	**105**	**190**	**203**
Remaining State and Federal Obligations under 1999 SIP			**118**		**0**	

2010 summer planning based on 1997 AQMP inventory. Emission reductions from individual measure may not add to total due to rounding. ( ) = Emission increase relative to baseline. BAR = Bureau of Automotive Repair; DPR = Department of Pesticide Regulation

[1] Measures M3, M8, CP3, and the Smog Check II program from the 1994 SIP had already been adopted when the SIP was revised in 1997. The reductions from these measures are included in the 1997 SIP baseline. Although the Smog Check II program is achieving significant benefits, the emission reductions are less than anticipated in the 1997 SIP as indicated by the negative number under reductions achieved.

[2] Emissions from gas cans were not included in the 1997/1999 SIP baseline; reductions from this source are real, but not creditable until the SIP is revised to reflect these emissions.

[3] The NOx reductions anticipated from the long-term mobile source "Black Box" commitment have already been achieved from adopted measures.

[4] Emission reductions from locomotives represent the national emission standards for locomotive engines as well as the MOU for the South Coast Air Basin. U.S. EPA has committed to adopt a backstop commitment to ensure that the emission reductions associated with the MOU are achieved. The MOU is hereby included as part of the 2003 AQMP SIP submittal. A copy of the MOU is available at http://www.arb.ca.gov/msprog/offroad/loc/loco.htm.

[5] CARB's rule complements District Rule 461. An overall reduction of 6 tons per day of VOC reductions from this category is included in the AQMP baseline.

2003 AQMP REVISION

As mentioned earlier in this chapter, this 2003 revision to the AQMP is designed to satisfy the planning requirements of the California Clean Air Act and to develop transportation emission budgets using the latest approved motor vehicle emissions model and planning assumptions. Once approved by the District Governing Board and CARB, the 2003 AQMP will be submitted to U.S. EPA as a SIP revision. The District component of the 2003 AQMP contains the remaining measures from the 1997/1999 SIP along with new measures based on current technology assessments. The emission reduction commitment takes into account technical feasibility, cost effectiveness, and current emission estimates.

Federal Clean Air Act Planning Requirements

In November 1990, Congress enacted a series of amendments to the Clean Air Act intended to intensify air pollution control efforts across the nation. One of the primary goals of the 1990 Clean Air Act Amendments was an overhaul of the planning provisions for those areas not currently meeting National Ambient Air Quality Standards (NAAQS). The CAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and an attainment demonstration, and incorporates more stringent sanctions for failure to attain or to meet interim milestones. The discussion that follows briefly presents the general planning requirements of the CAA, lists previous State Implementation Plan (SIP) submittals, and introduces CAA provisions that are addressed in the 2003 AQMP.

General Requirements

The CAA requires plans to provide for the implementation of all reasonably available control measures "as expeditiously as practicable," including the adoption of reasonably available control technology for reducing emissions from existing sources. Emission control innovations in the form of market-based approaches are explicitly encouraged by the CAA. As mentioned earlier, the District is the first local agency in the country to adopt a market-based approach for controlling stationary source emissions of oxides of nitrogen and sulfur. The CAA also requires plans to include standards for reasonable further progress, which is defined as annual incremental reductions in emissions of relevant air pollutants needed to ensure attainment of the National Ambient Air Quality Standards (NAAQS) by the applicable date. A similar demonstration of progress was instituted in California with the passage of the California Clean Air Act in 1988. This is discussed further later in this chapter.

There are several sets of general planning requirements, both for nonattainment areas [Section 172(c)] and for implementation plans in general [Section 110(a) (2)]. These

requirements are listed and very briefly described in Tables 1-4 and 1-5, respectively. The general provisions apply to all applicable pollutants unless superseded by pollutant-specific requirements.

TABLE 1-4

Nonattainment Plan Provisions
[CAA Section 172(c)]

Requirement	Description
Reasonably available control measures	Implementation of all reasonably available control measures as expeditiously as practicable.
Reasonable further progress	Provision for reasonable further progress which is defined as "such annual incremental reductions in emissions of the relevant air pollutant as are required for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date."
Inventory	Development and periodic revision of a comprehensive, accurate, current inventory of actual emissions from all sources.
Allowable emission levels	Identification and quantification of allowable emission levels for major new or modified stationary sources.
Permits for new and modified stationary sources	Permit requirements for the construction and operation of new or modified major stationary sources**.**
Other measures	Inclusion of all enforceable emission limitations and control measures as may be necessary to attain the standard by the applicable attainment deadline.
Contingency measures	Implementation of contingency measures to be undertaken in the event of failure to make reasonable further progress or to attain the NAAQS.

TABLE 1-5

General CAA Requirements for Implementation Plans

Requirement	Description
Ambient monitoring	An ambient air quality monitoring program. [Section 110(a)(2)(B)]
Enforcement and regulation	A program for the enforcement of adopted control measures and emission limitations and regulation of the modification and construction of any stationary source to assure that the NAAQS are achieved. [Section 110(a)(2)(C)]
Interstate transport	Adequate provisions to inhibit emissions that will contribute to nonattainment or interfere with maintenance of NAAQS or interfere with measures required to prevent significant deterioration of air quality or to protect visibility in any other state. [Section 110(a)(2)(D)]
Adequate resources	Assurances that adequate personnel, funding, and authority are available to carry out the plan. [Section 110(a)(2)(E)]
Source testing Monitoring	Requirements for emission monitoring and reporting by the source operators. [Section 110(a)(2)(F)]
Plan revisions	Provisions for revising the air quality plan to incorporate changes in the standards or in the availability of improved control methods. [Section 110(a)(2)(H)]
Other CAA requirements	Adequate provisions to meet applicable requirements relating to consultation, notification, and prevention of significant deterioration and visibility protection contained in other sections of the CAA. [Section 110(a)(2)(J)]
Impact assessment	Appropriate air quality modeling to predict the effect of new source emissions on ambient air quality. [Section 110(a)(2)(K)]
Permit fees	Provisions requiring major stationary sources to pay fees to cover reasonable costs for reviewing and acting on permit applications and for implementing and enforcing the permit conditions. [Section 110(a)(2)(L)]
Local government participation	Provisions for consultation and participation by local political subdivisions affected by the plan. [Section 121]
Transportation control measures	Provisions requiring that serious and above nonattainment areas submit an implementation plan that includes transportation control measures considering at least the measures listed in Section 108(f). [Section 182(c)(5)]

U.S. EPA guidance[3] states that regulatory programs tend to be less than 100 percent effective for many source categories. Rule effectiveness reflects the ability of a regulatory program to achieve all the emission reductions that could be achieved by full compliance with the applicable regulations at all sources at all times. An effectiveness factor of 80 percent is required by EPA for all stationary source and non-tailpipe mobile source control measures for the future controlled scenarios. EPA, however, does allow exceptions to this rule if data exists to adequately demonstrate that the "real world" control percentage is higher. The District has an aggressive field enforcement program and periodic rule effectiveness studies have assisted the District in strategic deployment of inspection resources to minimize emission-related non-compliance. In addition, the District conducts workshops and compliance education programs for facility operators. Consequently, historical emissions inventory reporting has demonstrated sufficient compliance margin by the regulated sources that would ensure nearly 100 percent rule effectiveness. As a result, the control measures proposed in the 2003 AQMP with quantifiable emission reductions are based on a rule effectiveness of 100 percent.

The CAA requires that most submitted plans include information on tracking plan implementation and milestone compliance. Requirements for these elements are described in Section 182(g) and Section 187(d) for ozone and carbon monoxide, respectively. Chapter 7 addresses these issues.

EPA also requires a public hearing on many of the required elements in SIP submittals before considering them officially submitted. The District's AQMP adoption process includes a public hearing on all of the required elements prior to submittal.

CAA Planning Requirements Addressed by the 2003 AQMP

Table 1-6 lists the CAA planning requirements addressed by the 2003 AQMP. The table lists the relevant CAA section and submittal deadline along with the AQMP document or chapter where the submittal is discussed. It may be used as a reference guide showing where each of the CAA planning requirements is addressed.

Besides the CAA requirements due prior to this plan revision (i.e., attainment demonstration plans for ozone, carbon monoxide, and nitrogen dioxide; 1996 Rate-of-Progress and Post-1996 Rate-of-Progress for ozone; and Best Available Control Measures (BACM) for PM10), the District is updating its 1997 PM10 attainment demonstration, which was required by Section 189.

[3] Emission Inventory Requirements for Carbon Monoxide State Implementation Plans; U.S. Environmental Protection Agency; OAQPS, Research Triangle Park, NC, March 1991.

TABLE 1-6

CAA SIP Revisions and Submittals in the 2003 AQMP

Submittal	CAA Section	2003 AQMP Reference
PM10 Attainment Demonstration Revision (Basin)	189(b)(1)(A)	Chapter 5 Appendix V
PM10 Attainment Demonstration Revision (Coachella Valley)	189(b)(1)(A)	Separate Cover
PM10 Reasonable Further Progress Milestones	189(c)(1)	Chapter 6 Appendix V
PM10 Motor Vehicle Emissions Budget	176(c)(2)(A)	Chapter 6
Maintenance Plan for Nitrogen Dioxide	175A(a) and (d)	Chapter 5 and 6 Appendix V
Revision to the Ozone Attainment Demonstration (Basin)	182(c)(2)(A)	Chapter 5 Appendix V
Revision to the Ozone Attainment Demonstration for Salton Sea Air Basin (under District jurisdiction)	182(c)(2)(A)	Chapter 8 Appendix V
Revision to the Post-1996 Rate-of-Progress Demonstration	182(c)(2)(B)	Chapter 6 Appendix V
Revision to the Carbon Monoxide Attainment Demonstration	187(b)(1)	Chapter 5 Appendix V
Growth Factors	--	Appendix III
Control Measure Documentation	--	Appendix IV

As specified in Section 189(b)(1)(A) of the Act, the PM10 attainment demonstration is due no later than four years after reclassification of an area to "serious." The South Coast Air Basin and the Coachella Valley were reclassified from "moderate" to "serious" on February 8, 1993. The 1997 AQMP and the 1994 Coachella Valley SIP satisfied the attainment demonstration requirements for the Basin and Coachella Valley, respectively. Prior to 1997, the Coachella Valley achieved federal PM10 standards and, accordingly, the District prepared a redesignation request and maintenance plan in 1996. During 1999 – 2001, however, Coachella Valley exceeded the annual average PM10

standard. Accordingly, the District revised the PM10 Coachella Valley SIP in 2002 to request a 5-year extension for PM10 attainment. The U.S. EPA approved the 2002 update on April 18, 2003.

Also in 2002, the District submitted a PM10 SIP update for the South Coast Air Basin and requested U.S. EPA to expedite its approval process and grant the Basin a 5-year extension for PM10 attainment demonstration. As part of this update, the District committed to provide a SIP update in 2003 using the latest emissions data and planning assumptions. The 1997 PM10 SIP as updated in 2002 was deemed complete by U.S. EPA in November 2002 and approved on April 18, 2003. The 2003 AQMP serves to provide an update to the 1997 PM10 SIP (and subsequent 2002 update) and it incorporates the most current emissions data, including the latest available motor vehicles emissions budgets based on EMFAC2002 and latest planning assumptions.

As part of the PM10 attainment demonstration, the plan must also contain emission reduction milestones to be achieved every three years until the area is redesignated attainment and the emission reductions must demonstrate reasonable further progress as defined under Section 171(l) of the Act.

The U.S. EPA released a natural events policy in 1996 which exempts certain high wind events causing PM10 air quality exceedances as being counted as a violation. The District will be applying this policy to the Coachella Valley in designing the attainment demonstration for that area. The 2003 Coachella Valley plan is released under a separate cover and is discussed in Chapter 8 of this document.

With new technical information on emissions estimates, the future-year baseline emissions projections changed, thereby requiring updates to previous SIP submittals. In particular, the emission budgets currently approved for federal conformity purposes must be updated and the California Ozone SIP for the South Coast Air Basin must be updated to reflect the best available technical information.

Monitoring data for the past several years have shown that the nitrogen dioxide concentrations were below the federal air quality standard. Accordingly, the 2003 AQMP will serve as the maintenance plan for nitrogen dioxide. As required under Section 175A(a), the plan must provide for maintenance of the air quality standard for at least 10 years after the area is redesignated to attainment (which occurred in 1998). In addition, the plan must contain contingency measures to assure that any violations will be promptly corrected. Similarly, the South Coast Air Basin met the carbon monoxide standard by December 2002. As such, the 2003 revision to the carbon monoxide plan serves a dual purpose: it replaces the 1997 attainment demonstration that lapsed at the end of 2000, and it provides the basis for a carbon monoxide maintenance plan in the future.

Section 181(a)(1) classifies the Basin as an extreme nonattainment area for ozone and states that the Basin must achieve the federal ozone standard by November 15, 2010. As such, an attainment demonstration for ozone was provided as part of the ozone portion of the 1997/1999 SIP. The ozone attainment demonstration followed U.S. EPA and CARB modeling guidelines and was based on the photochemical grid model called the Urban Airshed Model (UAM). Based on new technical information, the 1997/1999 AQMP ozone attainment demonstration is revised as part of the 2003 AQMP revision and the attainment demonstration is summarized in Chapters 5 and 6 and Appendix V.

According to Section 182(c)(2)(B), the District must demonstrate how the Basin will achieve actual volatile organic compound emission reductions of at least three percent per year averaged over each consecutive three-year period beginning from November 15, 1996 and ending November 15, 2010 (i.e., the Basin's attainment date). The rate-of-progress milestone years in the 2003 AQMP for the Basin are 2005, 2008, and 2010. Section 182(c)(9) requires that the post-1996 rate-of-progress demonstration must contain a set of contingency measures, that is, additional control measures which would be implemented in the event of a milestone or attainment failure. Chapter 6 contains the detailed calculations of the post-1996 rate-of-progress demonstration. Chapter 6 also provides an estimation of the emission levels at each of the milestone years compared to the CAA target levels. Contingency measures are listed in Chapter 9.

The South Coast Air Basin both transports to and receives air pollutants from the coastal portions of Ventura and Santa Barbara counties in the South Central Coast Air Basin. The South Coast Air Basin also receives air pollutants from oil and gas development operations on the outer continental shelf. The 2003 AQMP does not specifically address the control requirements for these adjacent areas. However, the control measures in this Plan meet the CAA transport requirements and will assist downwind areas in complying with the federal ozone air quality standard.

The Coachella Valley is classified as a "severe-17" ozone nonattainment area under the CAA and must comply with the federal ozone air quality standard by 2007. The CAA requires separate attainment and post-1996 rate-of-progress demonstrations for each severe air basin under the District's jurisdiction. Such demonstrations were provided in Chapter 8 and Appendix V of the 1997 AQMP. Revisions to the PM10 attainment demonstration for the Coachella Valley area are provided under a separate cover and Appendix V of the 2003 AQMP.

State Law Requirements

The California Clean Air Act (CCAA) was signed into law on September 30, 1988, became effective on January 1, 1989, and was amended in 1992. Also known as the Sher Bill (AB 2595), the CCAA established a legal mandate to achieve health-based

state air quality standards at the earliest practicable date. The Lewis Presley Act provides that the plan must also contain deadlines for compliance with all state ambient air quality standards and the federally mandated primary ambient air quality standards [Health and Safety Code (H&SC) 40462(a)]. In September 1996, AB 3048 (Olberg) amended Sections 40716, 40717.5, 40914, 40916, 40918, 40919, 40920, 40920.5, and 44241, and repealed Sections 40457, 40717.1, 40925, and 44246 of the Health and Safety Code relating to air pollution. The amendments to the Health and Safety Code became effective January 1, 1997. This plan revision reflects state planning requirements as they pertain to the South Coast Air Quality Management District. Through its many requirements, the CCAA serves as the centerpiece of the Basin's attainment planning efforts since it is generally more stringent than the federal Clean Air Act.

Based on pollutant levels, the CCAA divides nonattainment areas into categories with progressively more stringent requirements (H&SC 40918 - 40920.5). The categories are outlined in Table 1-7. The state nonattainment designations are on a county basis. The entire Basin is an extreme nonattainment area for ozone. Los Angeles County is the only county classified as a serious nonattainment area for carbon monoxide. However, in 2001 the carbon monoxide standards were not exceeded anywhere in the Basin. Although PM10 is not explicitly addressed in the CCAA, it is governed by the Lewis Presley Act. The plan therefore provides achieving all federal ambient air quality standards by their applicable date and state ambient air quality standards as early as possible.

TABLE 1-7

California Clean Air Act Nonattainment Area Classifications (H&SC 40921.5)

	Concentration Level (ppm)	
Category	**Ozone**	**Carbon Monoxide**
Moderate	0.09 to 0.12*	9.0 to 12.7*
Serious	0.13 to 0.15*	> 12.7
Severe	0.16 to 0.20*	--
Extreme	> 0.20	--

* Inclusive range.

Serious and above nonattainment areas are required to revise their air quality management plan to include specified emission reduction strategies, and to meet milestones in implementing emission controls and achieving more healthful air quality. The key planning requirements are provided in Table 1-8. Some of these requirements

are discussed in further detail in the next section. Chapter 6 addresses how these requirements are met in the Basin. The CCAA also includes some additional requirements that can significantly affect control strategy selection. These requirements are provided in Table 1-9. All of these mandates have either already been met through District regulations or are included/considered in the preparation of the 2003 AQMP.

Plan Effectiveness

The CCAA requires, beginning on December 31, 1994 and every three years thereafter, that each district demonstrate the overall effectiveness of its air quality program. For those areas that do not attain state air quality standards by 2000, a comprehensive plan update was required to be submitted by December 31, 1997. In addition, Section 40925 of the Health and Safety Code requires that the plan incorporate new data or projections including, but not limited to, the quantity of emission reductions actually achieved in the preceding three-year period and the rates of population-related, industry-related, and vehicle-related emissions growth actually experienced in the district and projected for the future. The 2003 AQMP serves as the comprehensive plan update for the South Coast Air Basin.

TABLE 1-8

California Clean Air Act Planning Requirements

Requirement	Description
Indirect and area source controls	An indirect and area source control program [H&SC 40918(a)(4)],
Best available retrofit control technology	Best available retrofit control technology (BARCT) for existing sources of specified sizes [H&SC 40918(a)(2))],
New source review	A program to mitigate all emissions from new and modified permitted sources [H&SC 40918(a)(1)) and 40920.5(b)],
Transportation control measures	Transportation control measures as needed to meet plan requirements [H&SC 40918(a)(3)], and
Clean fleet vehicle programs	Significant use of low-emission vehicles by fleet operators [H&SC 40919(a)(4)].

The CCAA suggests a number of air quality indicators to show Plan effectiveness, including actual emission reductions, ozone and carbon monoxide design value

improvements, population exposure reductions, and pollutant concentration hours. In Chapter 6, plan effectiveness is illustrated by trends in the following indicators:

- volatile organic compound, oxides of nitrogen, and carbon monoxide emissions,
- ozone and carbon monoxide air quality (i.e., exceedance days), and
- ozone and carbon monoxide population exposure above air quality standards.

TABLE 1-9

California Clean Air Act Requirements for Control Strategy Development

Requirement	Description
Rate-of-progress	Reducing pollutants contributing to nonattainment by five percent per year or all feasible control measures and an expeditious adoption schedule(H&SC 40914),
Public education programs	Public education programs [H&SC 40918(a)(6)],
Per-capita exposure	Reducing per-capita population exposure to severe nonattainment pollutants according to a prescribed schedule [H&SC 40920(c)],
Any other feasible controls	Any of the feasible controls that can be implemented or for which implementation can begin, within 10 years of adoption date of the most recent air quality plan [H&SC 40920.5(c)], and
Control measure ranking	Ranking control measures by cost-effectiveness and implementation priority (H&SC 40922).

Emission Reductions

According to the CCAA, districts must design their air quality management plan to achieve a reduction in basinwide emissions of five percent or more per year (or 15 percent or more in a three-year period) for each nonattainment pollutant or its precursors (H&SC 40914). However, an air basin may use an alternative emission reduction strategy which achieves a reduction of less than five percent per year if it can be demonstrated that either of the following applies:

- The alternative emission reduction strategy is equal to or more effective than the five percent per year control approach in improving air quality; or

- That despite the inclusion of every feasible measure, and an expeditious adoption schedule, the air basin is unable to achieve the five percent per year reduction in emissions.

For emission reduction accounting purposes, the CARB established a seven-year initial reporting period from January 1, 1988, to December 31, 1994 (Section 70701 of the California Code of Regulations). The reporting intervals after this initial period occur every three years (i.e., 1997, 2000, etc.). Therefore, the 2003 AQMP must seek to achieve a 15 percent additional reduction for every subsequent interval using 1990 as the base year, or demonstrate implementation of all feasible measures.

Population Exposure

The CCAA also requires that exposure to severe nonattainment pollutants above standards must be reduced from 1986 through 1988 levels by at least 25 percent by December 31, 1994; 40 percent by December 31, 1997; and 50 percent by December 31, 2000. Reductions are to be calculated based on per-capita exposure and the severity of exceedances. This provision is applicable to ozone, carbon monoxide, and nitrogen dioxide in the Basin [H&SC 40920(c)]. The definition of exposure is the number of persons exposed to a specific pollutant concentration level above the state standard times the number of hours. The per-capita exposure is the population exposure (units of pphm-persons-hours) divided by the total population. The 2003 AQMP will demonstrate that this requirement has already been met through implementation of previous SIP commitments.

Control Measure Ranking

The CCAA requires the District Governing Board to determine that the AQMP is a cost-effective strategy that will achieve attainment of the state standards by the earliest practicable date (H&SC 40913). In addition, the Plan must include an assessment of the cost-effectiveness of available and proposed measures and a list of the measures ranked from the least cost-effective to the most cost-effective [H&SC 40922(a)].

In addition to the relative cost-effectiveness of the measures, the District must consider other factors as well in developing an adoption and implementation schedule [H&SC 40922(b)]. The other factors noted in the CCAA include technological feasibility, emission reduction potential, rate of reduction, public acceptability, and enforceability. Efficiency, equity, and legal authority have also been included in the 2003 AQMP for prioritization purposes because of their importance. The results of the prioritization are given in Chapter 6.

FORMAT OF THIS DOCUMENT

This document is organized into ten chapters, each addressing a specific topic. Each of the remaining chapters are summarized below.

Chapter 2, "Air Quality and Health Effects," discusses the Basin's air quality in comparison with the federal and state air pollution standards.

Chapter 3, "Base Year and Future Emissions," summarizes recent updates to the emissions inventories, estimates current emissions by source and pollutant, and projects future emissions with and without controls.

Chapter 4, "AQMP Control Strategy," presents the attainment strategies.

Chapter 5, "Future Air Quality," describes the modeling approach used in the AQMP and summarizes the Basin's future air quality projections with and without controls.

Chapter 6, "Clean Air Act Requirements," discusses specific federal and state requirements as they pertain to the 1997 AQMP.

Chapter 7, "Implementation," presents the implementation schedule of the various control measures and delineates each agency's area of responsibility.

Chapter 8, "Future Air Quality - Desert Nonattainment Areas," describes the future air quality in the Coachella Valley Planning Area.

Chapter 9, "Contingency Measures," presents contingency measures as required by the federal CAA .

Chapter 10, "Looking Beyond Current Requirements", examines the planning and control implications of federal standards for 8-hour ozone and PM2.5; and provides a first look at an ozone air quality analysis for the year 2020. This chapter also presents a discussion on uncertainties associated with the technical analysis used to develop the 2003 AQMP, including selection of air quality episodes and models.

For convenience, a "Glossary" is provided at the end of the document, presenting definitions of commonly used terms found in the 2003 AQMP.