MDAQMD
Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area)

Adopted on:
June 9, 2008

Mojave Desert Air Quality Management District
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This document was prepared by the MDAQMD Planning, Rule-making and Grants section, with input from the entire MDAQMD staff. Significant portions of this document were prepared by, or are based on work done by, the California Air Resources Board and the South Coast Air Quality Management District staffs. The MDAQMD staff greatly appreciates the assistance of those agencies in the preparation of this document.

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Abbreviations and Acronyms

AQAP..... Air Quality Attainment Plan
AQMA ..... Air Quality Management Area
AQMP ..... Air Quality Management Plan
CALGRID..... California Photochemical Grid Model
CARB..... California Air Resources Board
CCAA ..... California Clean Air Act
CO ..... Carbon Monoxide
ERC..... Emission Reduction Credit
FCAA..... Federal Clean Air Act
FMVCP ..... Federal Motor Vehicle Control Program
FONA..... Federal Ozone Non-attainment Area
MDAQMD..... Mojave Desert Air Quality Management District
MPR ..... Model Performance Ratio
NAAQS..... National Ambient Air Quality Standard
NO_X..... Oxides of Nitrogen
NSR..... New Source Review
O_3 ..... Ozone
RACT..... Reasonably Available Control Technology
ROG ..... Reactive Organic Gases
ROP..... Rate of Progress
RRF ..... Relative Reduction Factor
SAAQS ..... State Ambient Air Quality Standard
SBCAPCD ..... San Bernardino County Air Pollution Control District
SCAB ..... South Coast Air Basin
SCAG..... Southern California Association of Governments
SCAQMD ..... South Coast Air Quality Management District
SCAQS87..... 1987 Southern California Air Quality Study
SCOS97..... 1997 Southern California Ozone Study
SDMAQMA..... Southeast Desert Modified Air Quality Management Area
SSAB..... Salton Sea Air Basin
tpaad..... Tons per Annual Average Day
tposd..... Tons per Ozone Seasonal Day
UAM ..... Urban Airshed Model
USEPA..... United States Environmental Protection Agency
VMT..... Vehicle Miles Traveled
VOC ..... Volatile Organic Compounds
WMDONA..... Western Mojave Desert Ozone Non-attainment Area

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Executive Summary

The United States Environmental Protection Agency (USEPA) designated the Western Mojave Desert non-attainment area as non-attainment for the 8-hour ozone National Ambient Air Quality Standard (NAAQS) pursuant to the provisions of the Federal Clean Air Act (FCAA). A portion of the Mojave Desert Air Quality Management District (MDAQMD) is included in the Western Mojave Desert non-attainment area. The MDAQMD has adopted State and Federal attainment plans for the region within its jurisdiction. The most recent such plan that was approved by USEPA is the MDAQMD 2004 Ozone Attainment Plan adopted in 2004. The most recently adopted State plan is the 1996 Triennial Revision to the 1991 Air Quality Attainment Plan.

The MDAQMD has reviewed and updated all elements of the ozone plan. The portion of the MDAQMD designated as a Federal 8-hour ozone non-attainment area (FONA) will be in attainment of the 8-hour NAAQS for ozone by 2021.

This document includes the latest planning assumptions regarding population, vehicle activity and industrial activity. This document addresses all existing and forecast ozone precursor-producing activities within the MDAQMD through the year 2020. This document includes all necessary information to allow general and transportation conformity findings to be made within the MDAQMD.

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CHAPTER 1 – Introduction and Background

Purpose
Regulatory History
Statement of Issues
Federal Legal Requirements
State Legal Requirements
Pollutant Descriptions
Health Effects
Setting
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INTRODUCTION

Purpose

The Western Mojave Desert non-attainment area (as defined in 40 CFR 81.305) was designated non-attainment for the NAAQS for ozone by USEPA on April 15, 2004. The Western Mojave Desert Ozone Non-attainment Area (WMDONA) includes part of the San Bernardino County portion of the MDAQMD, as well as the Antelope Valley portion of Los Angeles County. The MDAQMD has experienced ambient ozone concentrations in excess of the 8-hour ozone NAAQS. This document: (1) demonstrates that the MDAQMD will meet the primary required Federal ozone planning milestones, attainment of the 8-hour ozone NAAQS by June 2021; (2) presents the progress the MDAQMD will make towards meeting all required ozone planning milestones; and (3) discusses the newest 0.075 part per million 8-hour ozone NAAQS, preparatory to an expected non-attainment designation for the new NAAQS. This document satisfies 42 U.S.C. §§7410, 7502, 7504 and 7511a (FCAA §§110, 172, 174, and 182) regarding implementation plans, non-attainment plan provisions, planning procedures, and ozone plan submissions and requirements for the 8-hour NAAQS.

BACKGROUND

Regulatory History

The USEPA designated a portion of the southwestern desert part of San Bernardino County as non-attainment and classified it as Moderate for the 8-hour standard. This area was classified based on an ozone design value calculated from 2001 through 2003 concentrations in the region. The Moderate classification requires attainment of the 8-hour ozone NAAQS by June 2010, six years after the date of designation.

The MDAQMD was established on July 1, 1993, pursuant to H&SC §41200 et seq (Statutes 1992 ch. 642). The MDAQMD was a successor agency to the San Bernardino County Air Pollution Control District (SBCAPCD), which had jurisdiction over the desert portions of San Bernardino County commencing in February 1977 through the formation of the MDAQMD. The Palo Verde Valley portion of eastern Riverside County was annexed by the MDAQMD from the South Coast Air Quality Management District (SCAQMD) effective July 1, 1994, pursuant to provisions of H&SC 41210(c) and MDAQMD Resolution 94-03.

Initial air quality planning for the region was the 1991 Air Quality Attainment Plan (AQAP) which was adopted by the SBCAPCD on August 26, 1991 in response to the State of California ozone planning requirements. Additional ozone plans were adopted by the MDAQMD to address Federal ozone planning requirements, most recently the MDAQMD 2004 Ozone Attainment Plan adopted on April 26, 2004. This document replaces or updates all previously submitted federal ozone plans.

Regional Ozone Planning Chronology

1989 - CARB designates SEDAB as non-attainment for ozone SAAQS
1990 - CARB classifies the SEDAB as moderate ozone non-attainment
November, 1990 - Adoption of Federal Clean Air Act Amendments
August 26, 1991 - Adoption of the 1991 Air Quality Attainment Plan (State) by SBCAPCD
July 1, 1993 - Formation of Mojave Desert Air Quality Management District
July 1, 1994 - Annexation of Palo Verde Valley portion of Riverside County
March 24, 1994 - Adoption of Rate-Of-Progress Plan (Federal) by MDAQMD
October 26, 1994 - Adoption of Attainment Demonstration Plan (Federal) by MDAQMD
1996 - SEDAB is subdivided into the Mojave Desert Air Basin (MDAB) and the Salton Sea Air Basin (SSAB)
January 22, 1996 - Adoption of Triennial Revision to 1991 AQAP (State) by MDAQMD
April 26, 2004 - Adoption of MDAQMD 2004 Ozone Attainment Plan

Statement of Issues

The MDAQMD is downwind of the Los Angeles basin, and to a lesser extent, is downwind of the San Joaquin Valley. Prevailing winds transport ozone and ozone precursors from both regions into and through the MDAB during the summer ozone season. These transport couplings have been officially recognized by CARB.[1] Local MDAQMD emissions contribute to exceedances of both the NAAQS and SAAQS for ozone, but photochemical ozone modeling conducted by the SCAQMD and CARB indicates that the MDAB would be in attainment of both standards without the influence of this transported air pollution from upwind regions.

Federal Legal Requirements

The MDAQMD must adopt a plan that provides for the implementation, maintenance and enforcement of the NAAQS within three years after promulgation of the NAAQS. The plan is to include enforceable emission limitations, provide for a monitoring program, provide for a permit program (including a new source review program), contingency measures, and air quality modeling (42 U.S.C. §7410(a); FCAA §110(a)). The MDAQMD most recently met this requirement with the MDAQMD 2004 Ozone Attainment Plan. This document represents an update to that plan. The MDAQMD has adopted enforceable emission limitations, has a monitoring system in place throughout the populated portions of the Federal Ozone Non-Attainment Area (FONA), maintains a permit program (including a New Source Review program with an ambient air quality modeling requirement), and has performed an attainment demonstration using air quality modeling. This document identifies a contingency measure – see chapter 3.

This document incorporates all reasonably available control measures (all such measures have already been adopted for the FONA or are being committed to adoption in this plan). This

[1] "Ozone Transport: 2001 Review," April 2001, CARB identifies the South Coast Air Basin as having an overwhelming and significant impact on the Mojave Desert Air Basin (which includes the Mojave Desert) and the San Joaquin Valley as having an overwhelming impact on the MDAB.

document includes a comprehensive, accurate and current inventory of actual emissions (42 U.S.C. §7502(c)(3), 7511a(a)(1); FCAA §§172(c)(3), 182(a)(1)).

This document discusses reasonable further progress (42 U.S.C. §§7502(c)(2), 7511a(b)(1); FCAA §§172(c)(2), 182(b)(1)) for the applicable periodic milestone dates (2008, 2011, 2014, 2017 and 2020) (42 U.S.C. §7511a(g); FCAA §182(g)). The FONA is not capable of meeting the reasonable further progress milestones on its own; the target levels would require reductions in source categories that are not under the jurisdiction of the MDAQMD (specifically mobile sources).

This document has been coordinated with the transportation planning process (42 U.S.C. §7504; FCAA §174). The document includes an emission budget for the FONA, and also includes the on-road mobile source emission budget for the Western Mojave Desert non-attainment area as an appendix.

This document updates the MDAQMD emissions inventory (42 U.S.C. 7511a(a)(1); FCAA §182(a)(1)).

The MDAQMD has an enhanced non-attainment pollutant monitoring program, requires reasonably available control technology (RACT) within the FONA, has a vehicle inspection and maintenance program, a De Minimis rule, and a gasoline vapor recovery rule. The District participates in the State's Clean-Fuel Vehicle Program, and performs periodic transportation activity consistency demonstrations (including a review of vehicle miles traveled growth) in conjunction with the Southern California Association of Governments (SCAG). The MDAQMD controls oxides of nitrogen (NO_x) in addition to Volatile Organic Compounds (VOC) within the FONA, and is addressing both pollutants in this document. The MDAQMD New Source Review (NSR) program defines sources emitting 25 tons per year or more as major and requires offsets at a 1.3 to 1 ratio (42 U.S.C. §§7511a(d), 7511a(d)(2); FCAA §§182(d) 182(d)(2)). Employer trip rules (42 U.S.C. §7511a(d)(1); FCAA §182(d)(1)) have been shown to be not cost-effective for the FONA due to low population density.

Pollutant Description and Health Effects

Ozone (or O_3) is a colorless gas that is a highly reactive form of oxygen. It has a strong odor when highly concentrated. Ozone can occur naturally but can also be formed from other compounds through photochemistry, a complex system of reactions with hydrocarbons and oxides of nitrogen in the presence of sunlight (ultraviolet). The MDAB experiences ozone concentrations in excess of the State and Federal ambient air quality standards.

Ozone can cause respiratory irritation and discomfort, making breathing more difficult during exercise. Ozone can reduce the respiratory system's ability to remove inhaled particles, increase pulse rate, decrease blood pressure and reduce the body's ability to fight infection. After six hours of exposure a healthy person can have significant reduction of lung function. It is an irritant towards the skin, eyes, upper respiratory system, and mucous membranes, although symptoms disappear after exposure. It may also be a carcinogen.

Setting

The MDAQMD includes the desert portion of San Bernardino County and a portion of eastern Riverside County commonly known as the Palo Verde Valley. A portion of the MDAQMD (herein referred to as the FONA) has been designated non-attainment for the 8-hour ozone NAAQS by USEPA as a portion of the Western Mojave Desert non-attainment area in 40 CFR 81.305. The ozone design value classifies the area as a Moderate non-attainment area with 2010 as the required attainment year (42 U.S.C. 7511(a)(2); FCAA §181(a)(2)). The FONA includes the communities of Phelan, Hesperia, Adelanto, Victorville, Apple Valley, Barstow, Joshua Tree, Yucca Valley and Twentynine Palms (the southwestern portion of the MDAQMD).

The MDAQMD covers more than 20,000 square miles and included 359,551 persons as of the 1990 census (approximately 445,000 in 2002). The region is characterized by hot, dry summers and cool winters, with little precipitation. The National Training Center at Fort Irwin, the Marine Corps Air Ground Combat Center, and portions of Edwards Air Force Base and the China Lake Naval Air Weapons Station are in the MDAQMD. The MDAQMD also includes the Mojave National Preserve and portions of Death Valley National Park and Joshua Tree National Park

The primary roadways in the MDAQMD are Interstate 15, Interstate 40, State Route 58 and United States Route 395. All of these highways carry a significant amount of transiting heavy duty truck traffic, and Interstate 15 carries a substantial amount of commute traffic into the greater Los Angeles Basin.

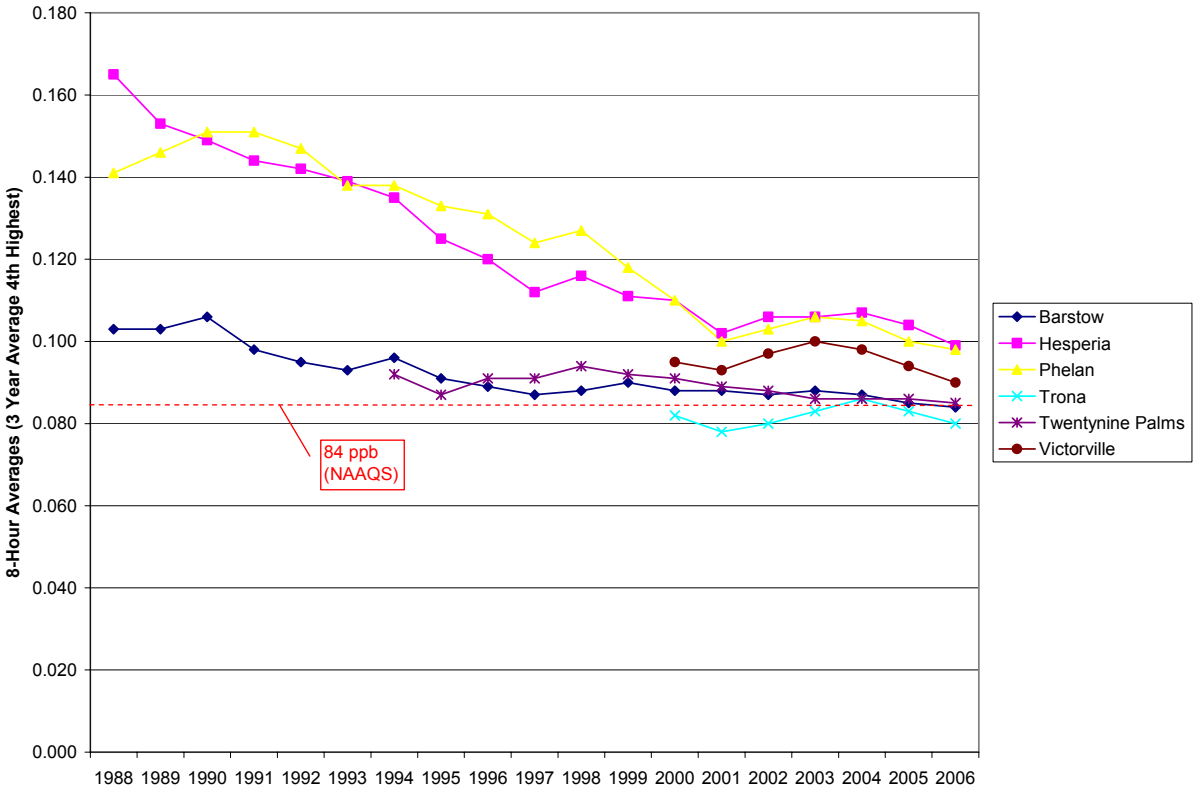
The MDAQMD includes railroad track connecting the Ports of Los Angeles and Long Beach with the rest of the continental United States, as well as large diameter high pressure natural gas transmission pipelines delivering the majority of the natural gas consumed within the State of California.

The MDAQMD is a growing bedroom community, but does have significant mining and military activity.

Ozone Trend

The MDAQMD has experienced a substantial reduction in maximum 8-hour ozone concentrations, as displayed in Figure 1 (Trona is not within the FONA but is shown for comparison). Note that the three stations closest to the South Coast Air Basin (the source of the majority of transported ozone and ozone precursors) have the highest historical ozone concentrations: Phelan, Hesperia and Victorville. The more distant or isolated stations (Barstow and Twentynine Palms) have much lower concentrations, and are in fact recently experiencing concentrations in attainment of the NAAQS.

Figure 1 - Federal 8-Hour Ozone Design Value Trend



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CHAPTER 2 – Emission Inventories

General
Modeled Emission Inventory and Sub-Region Inventory
Base Year
Future Years

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General

Ozone planning requirements call for the use of seasonal inventories representing emissions during a typical summer day (since ozone concentrations are typically highest under summer weather conditions). This document includes ozone seasonal day inventories, in units of tons per ozone seasonal day (or tons per os day, or tposd), unless otherwise indicated. All emissions presented in this document have been adjusted or calculated in terms of ozone seasonal day emissions.

Federal ozone planning requirements call for emissions in terms of Volatile Organic Compounds (VOC), while State ozone planning requirements call for emissions in terms of Reactive Organic Gases (ROG). Due to changes in each definition, there is no effective difference between the two terms (for example, ethane is now excluded from both definitions). For purposes of this document and attainment planning, the District considers these terms interchangeable.

Modeled Emission Inventory and Sub-Region Inventory

The emission inventory for the FONA sub-region of the MDAQMD is provided in Appendix A of this document. Complete documentation for San Bernardino Country emissions, including emission inventory calculation methodologies, are available from the following web address:

http://www.arb.ca.gov/ei/maps/basins/abmdmap.htm

ARB developed a list of the stationary source facilities in the 2002 CEIDARS inventory for San Bernardino County and submitted the list to MDAQMD staff for review to determine whether the facilities are located in the FONA. MDAQMD made this assessment and submitted the FONA facility list to ARB.

Stationary aggregated, areawide, on-road and other mobile sources emission sector types are all treated like area sources when assessing emissions in the FONA portion of San Bernardino County. MDAQMD evaluated the San Bernardino County area source inventory to determine the relative fractions that should be assigned to the San Bernardino FONA for these sectors. In most cases, the fractions span major emission category groups (as defined by EIC Summary Code). For a few categories, the fractions are specific to the Emission Inventory Code (EIC).

The California Emission Forecasting System (CEFS) was used to generate future year emission estimates for Stationary Point, Stationary Aggregated, and Areawide category sectors. These future year estimates are based on anticipated socioeconomic growth rates, and control factors that estimate the impacts of local and state control regulations. For stationary point sources, CEFS projections were run based on the 2002 emission inventory only for the facilities located in the FONA as previously determined. For Stationary Aggregated and Areawide sources, the fractions described above were applied to the San Bernardino County inventory developed for CEFSv1.06 and saved as part of the FONA inventory.

Emissions for On-Road sources (for all calendar years) were imported to CEFS directly from EMFAC2007v2.3. Emissions for off-road mobile sources (for all calendar years) were imported to CEFS directly from OFFROAD2007. To calculate the FONA portion, the appropriate

fractions were applied to CEFSv1.06 and saved as part of the FONA inventory as described above.

Federal Ozone Non-Attainment Area Base Year Emission Inventory

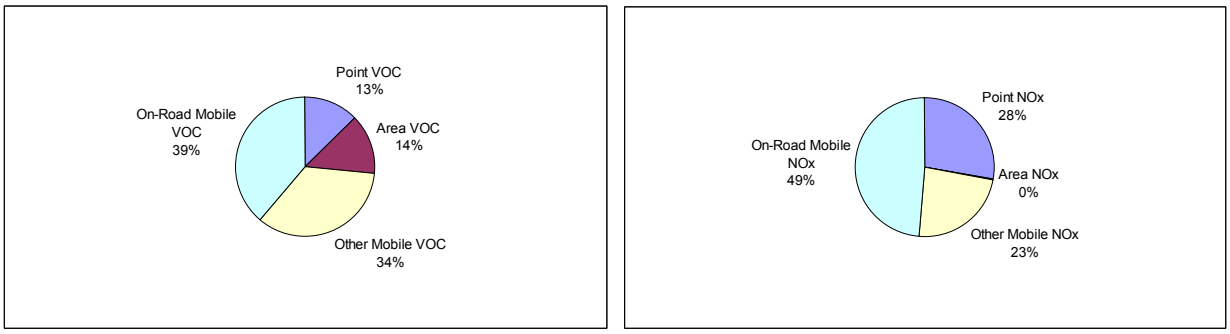
The initial Federal base year for emission inventory purposes is 2002. 2002 is used as the base year inventory for all growth scenarios in this document. The base year emission inventory is presented in Appendix A; a summary is presented in Table 1 below. Figure 2 presents the base year source category contributions in basic pie chart format (VOC on the left, NO_x on the right). Mobile sources were the primary emitters in the FONA in 2002.

Table 1 – 2002 Base Year Summary

	2002 VOC	2002 NOx
Point	5.97	42.18
Area	6.55	0.62
Other mobile	15.98	35.15
On-Road Mobile	18.20	74.24
Totals:	46.69	152.19

(tons per ozone seasonal day)

Figure 2 - 2002 Base Year Pie Charts (FONA)



Future Year Emission Inventories

Future year or forecasted emission inventories are estimated by multiplying a base year value for each category by a 'growth code' for a given future year. The 'growth code' is indexed to the base year (2002 for this document), so that its value for the base year is 1.00. This allows the growth code to estimate future activity in terms of emissions; if the growth code for the year 2007 is 1.50, activity in that category (and resulting emissions) is expected to be 50 percent greater than in 2002. The growth codes used to forecast point sources are available from CARB. Forecasted FONA VOC and NO_x inventory summaries for each year of interest are presented in Figures 3 and 4 respectively (the base year is included in each figure for reference). Future year emission inventories are presented in Appendix B.

Figure 3 - Forecasted VOC Emission Inventories (FONA)

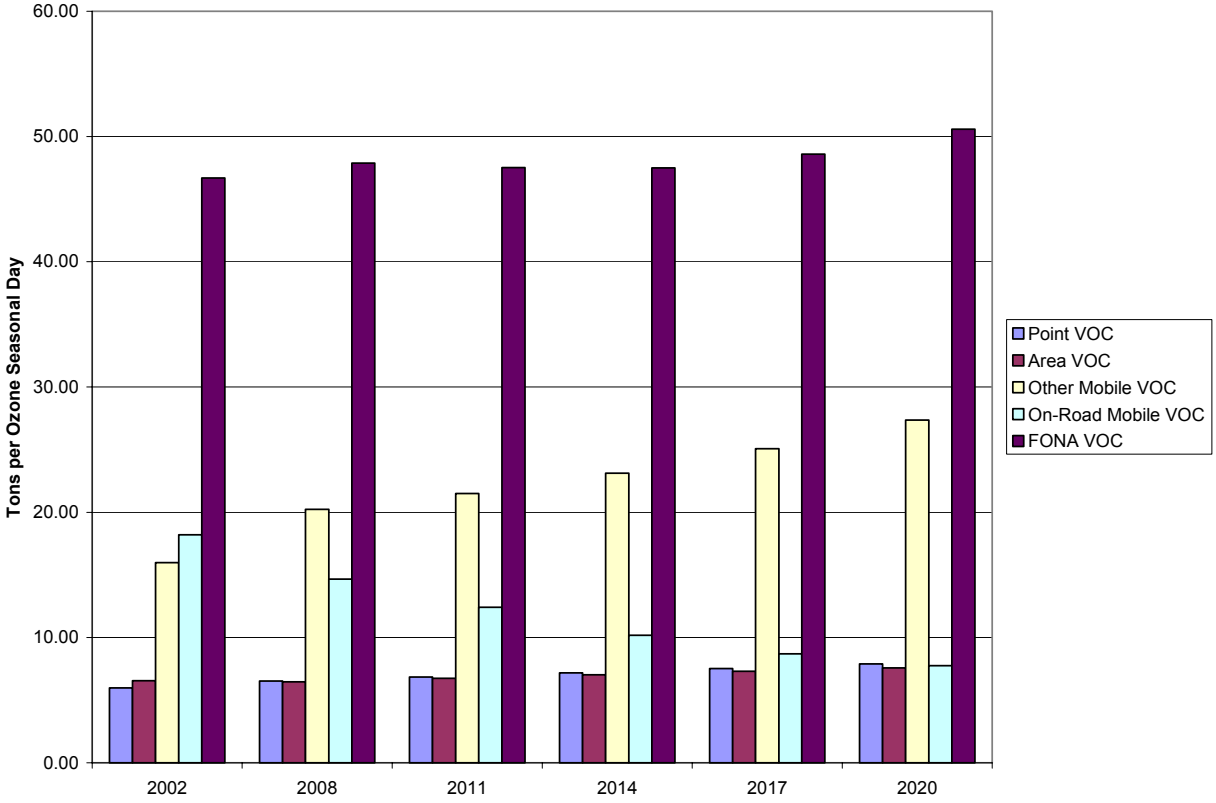
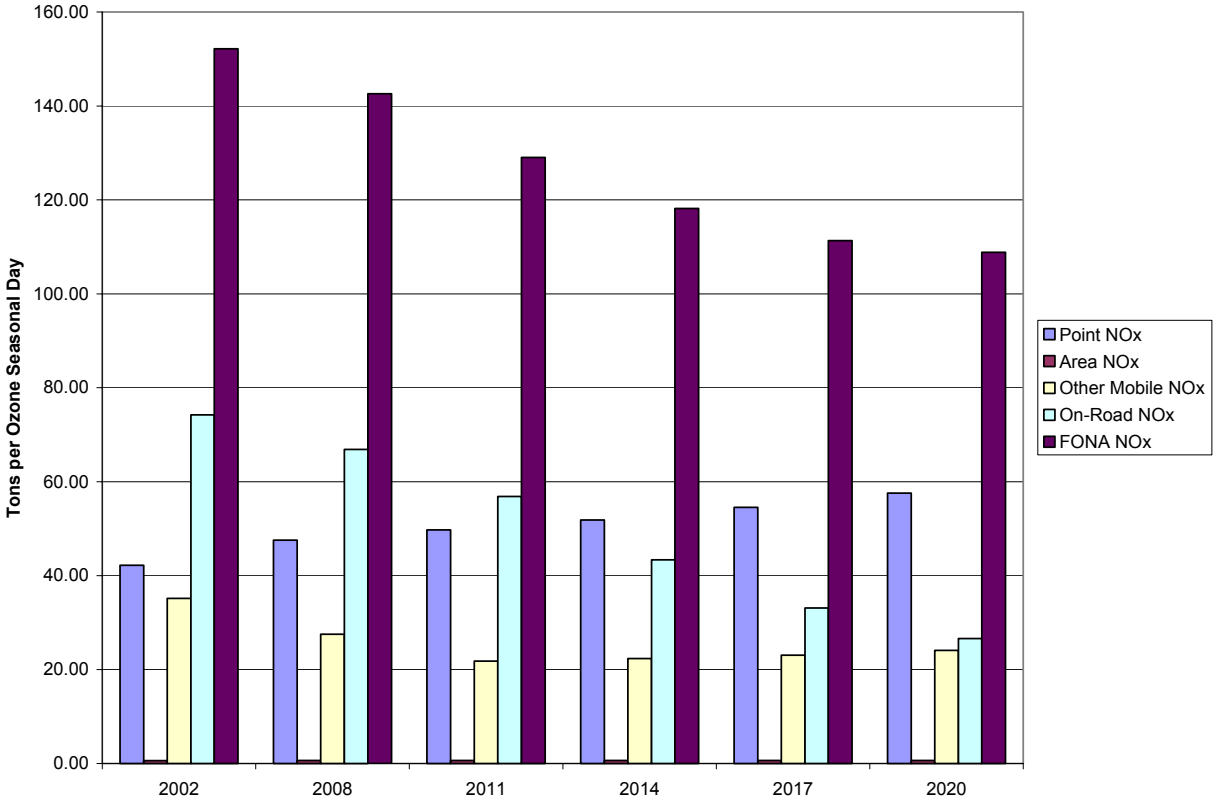


Figure 4 - Forecasted NO_x Emission Inventories (FONA)



CHAPTER 3 – Control and Contingency Measures

Existing Control Measures
Proposed Control Measures
Rule Adoption Schedule
Contingency Measures
Required Progress
Controlled Emission Inventories
Conformity Budgets

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Existing Control Measures

The current MDAQMD set of rules and regulations represents a broad set of control measures for MDAQMD sources. The MDAQMD has in place Reasonably Available Control Technology (RACT) requirements for the majority of sources (including gasoline dispensing vapor control), as well as an NSR program with a 25 ton per year major source level and a 1.3:1 offset ratio requirement. In 2006, the MDAQMD committed to taking action on several Federal RACT categories.[2] The MDAQMD has recently adopted Federal RACT rules for ship surface coating,[3] glass manufacturing[4] and polyester resin operations.[5] The MDAQMD had committed to adopting three additional RACT rules by the end of 2007 – the MDAQMD will update the adoption schedule for these actions.

Proposed Control Measures

The MDAQMD is not proposing to adopt any additional control measures for direct ozone precursor reduction purposes. However, the MDAQMD is committed to having all applicable Federal RACT rules, and is currently performing analyses on the feasibility of adopting additional rules under the State of California "all feasible measures" mandate. In addition, the MDAQMD will experience additional future emission reductions resulting from existing and proposed Federal and State control measures affecting mobile and area sources (see below).

State Control Measures

The California Air Resources Board (CARB or ARB) is the State agency responsible for ensuring clean air in California. Under State law, ARB has the responsibility to develop SIP strategies for mobile sources and consumer products, to coordinate SIP strategies with the Bureau of Automotive Repair (BAR) and Department of Pesticide Regulation (DPR), and to review local plans for attaining the State and Federal ambient air quality standards.

ARB adopted a State Strategy for California's 2007 SIP in September, 2007. The State Strategy is comprehensive; it is designed to enable local districts attain federal air quality standards through a combination of technologically feasible, cost-effective, and far reaching measures for motor vehicles and other statewide sources. The 2007 State Strategy is also the first to address the federal 8-hour ozone standard – it represents a transition from the less stringent 1-hour standard that was the benchmark for previous SIPs. The State Strategy also includes measures that will contribute to attainment of the federal standard for fine particulates (PM2.5) by the 2014 PM2.5 deadline. The South Coast Air Basin (SCAB) and the San Joaquin Valley are designated nonattainment for the federal PM2.5 standard.

California first enacted passenger car exhaust standards in 1973. Today the State's mobile source control program addresses a wide variety of on- and off-road vehicles and engines,

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[2] "8-Hour Reasonably Available Control Technology – State Implementation Plan Analysis (RACT SIP Analysis)," August, 2006
[3] "Rule 1106 – *Marine Coating Operations*," amended October 23, 2006
[4] "Rule 1165 – *Glass Melting Furnaces*," amended January 28, 2008
[5] "Rule 1162 – *Polyester Resin Operations*," adopted August 27, 2007

gasoline and diesel fuel standards, and engine maintenance requirements. The existing program is projected to reduce emissions from passenger vehicles and heavy-duty trucks by approximately 1/3 between 2006 and 2014. The State Strategy ARB adopted in 2007 will result in a greater than 50 percent reduction in emissions from all mobile sources in the South Coast Air Basin by 2014. Most of the controls in the State Strategy will be implemented statewide, and directly benefit the entire state. Some will uniquely target the South Coast and San Joaquin Valley Air Basins, directly reducing emissions in the State's most polluted areas, and indirectly improving air quality in downwind areas including Ventura, Antelope Valley, the Mojave Desert area, and the Coachella Valley.

The State Strategy addresses three key mobile source issues: the need to clean up the legacy diesel fleets, the national and international nature of many diesel fleets, and limitations on SIP credit for unsecured funding.

The total emission reductions and the obligation to propose specific measures for Board consideration would become enforceable upon approval by U.S. EPA of the State Strategy and each district's attainment plan. While the State Strategy includes estimates of the emission reductions from each of the individual new measures, it is important to note that the State's commitment is to achieve the aggregate emission reductions identified for the adopted State Strategy, from the baseline emissions identified in the SIP. Therefore, if a particular measure does not achieve its expected emission reductions, the State still commits to achieving the total aggregate emission reductions, whether this is realized through additional reductions from the new measures, or from alternative control measures or incentive programs. If actual emission decreases occur that exceed the projections reflected in the emission inventories and the State Strategy, the actual emission decreases may be counted toward meeting ARB's total emission reduction commitments.

ARB's emission reduction commitments may be achieved through a combination of actions including but not limited to the implementation of control measures; the expenditure of local, state or federal incentive funds; or through other enforceable measures.

Because ARB scientists determined that reducing emissions of one pollutant, oxides of nitrogen (NO_x), is the most beneficial in reducing levels of both ozone and PM2.5, the state plan focuses on curbing pollution from the sources that produce nearly 90 percent of the state's NO_x. These sources include cars, heavy duty trucks, large off-road equipment, ships and locomotives. The baseline emission inventories used to develop the 2007 and 2008 federal plans throughout the state incorporate reductions from control measures adopted through 2006. The State Strategy identifies new measures to be adopted through 2014; ARB has already acted on some of these measures.

The 2007 State Strategy includes the control measures identified below. Table 2 identifies the timeframes for adoption and implementation of these programs.

<u>Smog Check Improvements</u> The following changes are being developed to improve the effectiveness of the smog check program:

- A new low pressure evaporative test to examine passenger vehicles for leaks in fuel tanks and vapor lines that cause smog-forming emissions;
- More stringent inspection standards (cutpoints), which are used to determine if a vehicle passes or fails;
- Annual inspections for older and high use vehicles to shorten the time they are emitting excess emissions prior to being repaired;
- The addition of a visible smoke test; and,
- The addition of inspection requirements for diesel passenger cars and trucks and motorcycles, which are currently exempt from Smog Check.

Expanded Passenger Vehicle Retirement Incentives and other programs retire more high-emitting passenger vehicles, especially "off-cycle" vehicles – cars and light trucks that are between smog checks inspections.

Reformulated Gasoline Modifications Modifications to California's reformulated gasoline program will eliminate or offset permeation emissions resulting from the addition of ethanol to gasoline blends.

Cleaner In-Use Heavy-Duty Trucks Modernize diesel trucks and reduce emissions by requiring replacement or cleanup of the dirtiest trucks on the road. This critical regulation, which is expected to be considered for adoption in 2008, will also include a program for out-of-state trucks doing business in California.

Goods Movement Sources The 2007 State Strategy takes aim at emissions from ships, trucks, harbor craft and other sources associated with the growing goods movement sector. ARB has already adopted several goods movement emission reduction controls.

- Harborcraft In November 2007 ARB approved a measure that requires owners of commercial harbor craft to either replace old engines with newer, cleaner versions or add control technologies to clean up exhaust.
- Cold Ironing In December 2007, ARB approved a regulation to provide alternative power supplies at ports so that ships can use clean fuels, including electricity, instead of diesel-fueled auxiliary engines while at dock.
- Port Trucks In December 2007 ARB approved a measure requiring retrofit or replacement of older heavy-duty diesel trucks that service ports or deliver containers from ports to nearby transfer facilities.
- Ship Engines ARB staff is developing a regulation that would require ocean-going vessels to use cleaner fuels in ship main and auxiliary engines when they are operating near the California coast.
- Locomotives The State Strategy also calls for reducing emissions from line-haul locomotives by replacing and rebuilding existing engines beginning in 2012. This measure relies in part on U.S. EPA action to ensure that clean engines are available to meet this schedule.

Construction and Mining Equipment In July 2007, the Board approved a measure which regulates existing construction and other industrial equipment. The regulation establishes fleet average emission limits and requires older, dirtier engines to be replaced by current models or retrofitted with emission control devices. Accelerated clean-up provisions are available to local

districts that provide financial assistance to sources that would be subject to the more stringent requirements.

Agricultural Equipment ARB staff is evaluating the options for modernizing and reducing emissions from agricultural equipment, and ARB is expected to consider a regulation in 2009.

Recreational Boats Existing ARB regulations establish new emission limits for recreational boats beginning in 2009. The 2007 State Strategy calls for a more stringent, catalyst-based exhaust standard to be phased in by 2013.

Off-Road Recreational Vehicles The State Strategy includes expanded emission standards for off-road recreational vehicles that would reduce exhaust emissions from new vehicles by 50 percent beginning in 2012, using proven automotive and on-road motorcycle exhaust emission reduction technologies.

Fuel Storage ARB adopted enhanced vapor recovery for above ground storage tanks in June 2007. Additional evaporative emission standards are proposed for portable outboard marine tank engines and refueling gasoline tanks that are usually mounted on a vehicle and used to refuel other vehicles.

Consumer Products ARB staff will consider new approaches such as alternative, market-based mechanisms, multi-media labeling programs, and public education as it develops ways to meet the State Strategy commitment to further reduce ROG emissions from consumer products.

Greenhouse Gas Reduction Co-Benefits The California Global Warming Solutions Act of 2006 (AB 32) requires the adoption of a comprehensive program to reduce greenhouse gas emissions. ARB has already started to adopt regulations in response to this requirement. Although the AB 32 regulations will not directly reduce ozone precursors, many of these regulations are expected to have criteria pollutant "co-benefits."

Pesticides The Department of Pesticide Regulation's 2008 Pesticide Plan includes strategies to reduce ROG emissions from pesticides through regulation of fumigant pesticide use, regulatory standards for registration of liquid pesticides, and strategic partnership agreements implementing pest management practices and technologies that use less pesticide product.

Table 2 – Expected Emission Reductions from Proposed New SIP Measures

Mojave Desert Non Attainment Area -- 2020
(tons per day)

Proposed New SIP Measures	NOx	ROG	Direct PM2.5	SOx
Passenger Vehicles	**0.5**	**0.5**	**0**	**--**
Smog Check Improvements (BAR)	0.4	0.3	0	--
Expanded Vehicle Retirement	0.1	0	0	--
Modifications to Reformulated Gasoline Program	--	0.2	--	--
Heavy-Duty Trucks	**6.0**	**0.9**	**0.6**	**--**
Cleaner In-Use Heavy-Duty Trucks	6.0	0.9	0.6	--
Goods Movement Sources	**16.6**	**2.1**	**0.6**	**--**
Auxiliary Ship Engine Cold Ironing & Clean Technology	--	--	--	--
Cleaner Main Ship Engines and Fuel	--	--	--	--
Port Truck Modernization	--	--	--	--
Accelerated Intro. of Cleaner Line-Haul Locomotives	16.6	2.1	0.6	--
Clean Up Existing Harbor Craft	--	--	--	--
Off-Road Equipment	**0.5**	**0.1**	**0**	**--**
Cleaner In-Use Off-Road Equipment (over 25hp)	0.5	0.1	0	--
Cleaner In-Use Agricultural Equipment	NYQ	NYQ	NYQ	--
Other Off-Road Sources	**0**	**10.6**	**--**	**--**
New Emission Standards for Recreational Boats	0	0.1	--	--
Expanded Off-Road Rec. Vehicle Emission Standards	--	10.5	--	--
Additional Evaporative Emission Standards	--	NYQ	--	--
Vapor Recovery for Above Ground Storage Tanks	--	NYQ	--	--
Areaswide Sources	**--**	**0.5**	**--**	**--**
Consumer Products Program	--	0.5	--	--
Pesticides: DPR 2008 Pesticide Plan	--	NYQ	--	--
Emission Reductions from Proposed New Measures	**23.6**	**14.7**	**1.2**	**--**

NYQ = Not Yet Quantified. BAR = Bureau of Automotive Repair. DPR = Dept. of Pesticide Regulation
Locomotives measure relies on U.S. EPA rulemaking and industry agreement to accelerate fleet turnover.
Note: Emission reductions reflect the combination impact of regulations and supportive incentive programs.

Local Rule Adoption Schedule

The rule actions identified in Table 3 below are expected to have some (currently unquantified) positive effect on ozone precursor emissions. The State all feasible measures actions are analyses that may result in a rule adoption action depending on the outcome of the feasibility analysis – the specified date is for completion of the feasibility analysis.

Table 3 – MDAQMD Rule Adoption Schedule

Rule Title	Rule Nature	Adoption Date
Residential Space Heaters	Federal RACT	1/2009
Publicly Owned Treatment Works	Federal RACT	3/2009
Graphic Arts Amendment	Federal RACT	9/22/2008
Solvent Cleaning and Degreasing	State All Feasible Measures	10/27/2008
Gas Turbines	State All Feasible Measures	10/27/2008
Boilers, Generators and Process Heaters	State All Feasible Measures	10/27/2008
Internal Combustion Engines	State All Feasible Measures	10/27/2008
Cement Kilns	State All Feasible Measures	10/27/2008
Commercial Charbroilers	State All Feasible Measures	10/27/2008
Residential Gas Furnaces	State All Feasible Measures	10/27/2008

Rule Title	Rule Nature	Adoption Date
Residential Water Heaters	State All Feasible Measures	10/27/2008
Soil Decontamination	State All Feasible Measures	10/27/2008
Landfill Gas	State All Feasible Measures	10/27/2008
Adhesives and Sealants	State All Feasible Measures	10/27/2008
Woodworking Operations	State All Feasible Measures	10/27/2008
Lawnmower Buyback	State All Feasible Measures	10/27/2008
Metal Parts and Products Coating	State All Feasible Measures	10/27/2008
Spray Booths	State All Feasible Measures	10/27/2008
Wood Flat Stock Coating	State All Feasible Measures	10/27/2008
Composting Operations	State All Feasible Measures	10/27/2008
Residential Wood Burning	State All Feasible Measures	10/27/2008

Contingency Measures

The MDAQMD reaffirms the use of the State Enhanced Inspection and Maintenance Program as a contingency measure. The MDAQMD would implement the State of California's version of Enhanced I&M should a contingency measure be triggered by failure to attain the Federal 8-hour standard.

Required Progress

Federal law specifies that each ozone non-attainment area must demonstrate ongoing emission reductions relative to the base year (2002). Federal law requires a three percent (3%) per year reduction in VOC emissions, and does not allow credit to be taken for certain federal motor vehicle control programs (FMVCP). Where both VOC and NO_x emissions have been shown to contribute to high ozone levels, the Clean Air Act allows NO_x emission reductions to be used to augment VOC emission reductions in order to demonstrate reasonable further progress. In non-attainment areas that are impacted by transport from other regions, the Federal Clear Air Act also allows emissions and emission reduction from those regions to be taken into account when assessing reasonable further progress. Air quality modeling, described in Chapter 4, demonstrates that emissions from the SCAB contribute to violations of the NAAQS in both the Antelope Valley and Mojave Desert portions of the federal non-attainment area (the WMDONA)

Table 4 demonstrates that the rate of progress projected for the WMDONA meets Federal Clean Air Act requirements. The required rate of progress is met in part by substituting NO_x reductions for VOC reductions at the rate of 1.6 tons of NO_x per ton of VOC shortfall. The WMDONA consists of the Antelope Valley in Los Angeles County and the Mojave and Victor Valley portions of San Bernardino County. The reasonable further progress assessment takes into account projected emissions for upwind areas within 100 kilometers of the WMDONA (specifically Orange County and the SCAB portions of Los Angeles and San Bernardino Counties) as allowed by USEPA guidance.

Table 4 - Reasonable Further Progress for the WMDONA

Western Mojave Desert & Antelope Valley (with transport from Orange, San Bernardino-SCAB and LA-SCAB), summer planning, tons per day

	2002	2008	2011	2014	2017	2020
Baseline ROG	882.5	651.1	601.9	570.3	551.9	543.5
CA MVCP/RVP Adjustment	0.0	54.4	71.0	84.5	91.5	96.0
RACT Corrections	0	0	0	0	0	0
Adjusted 2002 Baseline ROG in milestone year	882.5	828.1	811.4	798.0	791.0	786.5
RFP commitment for ROG reductions from new measures		0	0	0	0	0
Required % change since previous milestone year (ROG or NOx) compared to 2002		15%	9%	9%	9%	9%
Required % change since 2002 (ROG or NOx)[1]		15%	24%	33%	42%	51%
Target ROG levels		703.9	616.7	534.6	458.8	385.4
Apparent shortfall in ROG		-52.78	-14.73	35.68	93.17	158.17
Apparent shortfall in ROG, %		-6.4%	-1.8%	4.5%	11.8%	20.1%
ROG shortfall previously provided by NOx substitution, %		0.0%	0.0%	0.0%	4.5%	11.8%
Actual ROG shortfall, %		-6.4%	-1.8%	4.5%	7.3%	8.3%
Baseline NOx	1123.7	905.0	789.0	696.9	622.9	574.2
CA MVCP Adjustment	0.0	64.8	80.8	93.2	98.7	102.8
Adjusted 2002 Baseline NOx in milestone year	1123.7	1058.8	1042.9	1030.4	1025.0	1020.8
RFP commitment for NOx reductions from new measures	0	0	0	0	0	0
Change in NOx since 2002		153.8	253.8	333.6	402.1	446.6
Change in NOx since 2002, %		14.5%	24.3%	32.4%	39.2%	43.8%
NOx reductions since 2002 already used for RFP substitution and contingency through last milestone year, %		0.0%	3.0%	3.0%	7.5%	14.8%
NOx reductions since 2002 available for RFP substitution and contingency in this milestone year, %		14.5%	21.3%	29.4%	31.8%	29.0%
Change in NOx since 2002 used for ROG substitution in this milestone year, %		0.0%	0.0%	4.5%	7.3%	8.3%
Change in NOx since 2002 available for contingency in this milestone year, %		3.0%	3.0%	3.0%	3.0%	3.0%
Change in NOx since 2002 surplus after meeting substitution and contingency needs in this milestone year, %		11.5%	21.3%	24.9%	24.4%	20.6%
RFP shortfall, if any		0.0%	0.0%	0.0%	0.0%	0.0%
RFP Met?		YES	YES	YES	YES	YES
Contingency Met?		YES	YES	YES	YES	YES

[1] 15% ROG only reduction required from 2002-2008

Controlled Emission Inventories

As the MDAQMD is not proposing any additional local control measures with quantified emission reductions, the controlled emission inventory is identical to the forecasted emission inventory.

Conformity Budgets

The forecasted emission inventories presented in this document are the emission budgets for general conformity purposes, as no additional control measures with quantified emission reductions are proposed. A project subject to the general conformity test must be demonstrated to conform with the applicable portion of the forecasted emission inventory. For a project that falls between forecasted years, a linearly interpolated inventory may be calculated. For a project that falls after 2020, use 2020.

The forecasted on-road mobile source inventory represents the emission budget for transportation conformity purposes, as no transportation control measures are proposed. A

project subject to the transportation conformity test must be demonstrated to conform with the forecasted on-road mobile source inventory. The FONA on-road mobile source inventory is presented below, in addition to the appendices. The portion presented in Table 5 is for information only - the MDAQMD is officially adopting the transportation budget for the entire Western Mojave Desert ozone non-attainment area as presented in Appendix C.

Table 5 - Transportation Conformity Budget (FONA)

(tons per ozone seasonal day)

	2002	2008	2011	2014	2017	2020
On-Road Mobile VOC	18.20	14.67	12.42	10.18	8.70	7.75
On-Road NOx	74.24	66.88	56.86	43.37	33.12	26.57

CHAPTER 4 – Attainment Demonstration

Modeling Approach Overview
Modeling Domain
Model Inputs
Modeling Results
ARB Weight of Evidence Assessment

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ATTAINMENT DEMONSTRATION

This chapter paraphrases and reiterates information from the most recent SCAQMD/CARB ozone model runs, the runs performed for the 2007 SCAQMD AQMP. For further information, please refer to Appendix V of that document.[6]

The Federal Clean Air Act (FCAA) required the use of photochemical air quality modeling to evaluate whether a proposed control strategy will result in attainment of the applicable ozone standard. Recognizing the uncertainty inherent in large-scale air quality models, recent federal guidance has also required an evaluation of supplementary data, known as a weight of evidence analysis. A weight of evidence analysis can also be used to support an attainment demonstration if photochemical modeling indicates that the control strategy will result in future ozone concentration that will approach but not quite reach the standard.

Modeling Approach Overview

The Western Mojave Desert ozone non-attainment area, which includes the MDAQMD, is a small portion of the complex greater Southern California airshed. Ozone and ozone precursors are known to flow (or be transported), under the influence of winds, throughout Southern California. The most technically accurate method of evaluating ozone concentrations, ozone emissions, and future ozone behavior is through a large modeling project that includes all of the affected areas in Southern California (and a portion of northern Mexico). The modeling effort has been performed as a joint project by all of the air districts in the region and CARB, with SCAQMD and CARB staff and resources doing the primary work. This regional modeling effort has allowed the most accurate understanding and prediction of future ozone concentrations for Southern California.

The modeled attainment demonstration in this plan was prepared using photochemical dispersion and meteorological tools developed in response to USEPA modeling guidelines, and recommendations from air quality modeling experts. The Urban Airshed Model (UAM) is the regional modeling system preferred by USEPA and CARB for analyzing ozone non-attainment areas. The UAM predicts future ambient ozone concentrations under historical conditions that led to high ambient ozone concentrations. These conditions are typically multi-day 'episodes' in which the State and Federal ozone standards were exceeded. The UAM also evaluates ozone precursor emissions, local and regional meteorology, and regional topography to calculate ozone concentrations. These calculations are performed on an hourly basis throughout the modeled episode, thus allowing the UAM to stimulate changing conditions (i.e. night, day and wind).

Meteorological fields were generated using the MM5 prognostic meteorological model, and the required modeling emissions inventories were developed by CARB and SCAQMD staff. The ozone air quality modeling utilized the Comprehensive Air Quality Model with Extensions (CAMx) model, with initial and boundary conditions based on estimates of clean-air concentrations. Analysis of the model outputs included the estimation of 1-hour and 8-hour ozone concentrations for each ozone monitoring site within the domain, as well as statistical

[6] "Final 2007 Appendix V - Modeling and Attainment Demonstrations," SCAQMD, June 2007

measures comparing observed and stimulated ozone concentrations. These analyses were used to evaluate model performance by sub-region within the domain.

Modeling Domain

The modeling domain is based on the domain defined for the 1997 Southern California Ozone Study and includes the South Coast Air Basin and the surrounding coastal, desert and mountain areas, including the MDAQMD. This model domain includes the upwind sources within SCAQMD, which are responsible for the overwhelming ozone transport into the MDAQMD. The northern boundary of the model extends into Santa Barbara and Kern counties, while the southern boundary extends in Mexico. The eastern boundary of the modeling domain extends into the desert portions of San Bernardino and Riverside counties, while the western boundary extends into the Pacific Ocean. The domain horizontal grid is 116 by 80 cells, with a cell resolution of five kilometers.

Model Inputs

SCAQMD performed the UAM attainment demonstration using data maintained by CARB and MDAQMD. The emissions inventory used for the UAM is consistent with the emissions inventory presented in the appendices to this document.

Modeling Results

Future years are simulated twice using the UAM: first, using the uncontrolled emissions inventory; and second, using a reduced emissions inventory controlled by the proposed ozone control strategy. Comparing the uncontrolled and controlled ambient ozone concentrations identifies the effectiveness of the proposed ozone control strategy. Attainment year ambient ozone concentrations using the reduced emissions inventory controlled by the proposed ozone control strategy should achieve the ozone standard.

As required by federal guidance, a relative reduction factor (RRF) approach was used in projecting future design values. The RRF reflects the ratio between the future year model prediction (in this case the end of 2020) and the reference year model prediction (in this case 2002). A reference or base year design value is then multiplied by the RRF to project a future year design value. The modeling satisfies the minimum five episode requirement for use in developing a site-specific RRF for most sites, as recommended by the USEPA guidance for modeling 8-hour ozone design values.

Table 6 presents the photochemical ozone modeling results for the FONA, including sites within the MDAQMD.

Table 6 - 2020 Federal Ozone Attainment Demonstration

(all values ozone in ppb)

		Modeled		
	Baseline (2001-2003)	**2012**	**2017**	**2020**
Lancaster	100.7	86.5	79.7	74.0
Phelan	104.7	92.6	86.7	80.5
Victorville	98.3	88.0	77.0	74.4
Hesperia	106.3	95.7	88.7	76.5
Barstow	87.6	79.7	73.2	79.5
Twentynine Palms	86.7	77.3	65.8	82.2

The modeling results show that the MDAQMD will not attain the 8-hour ozone NAAQS (84 ppb) by the 2012 attainment deadline for Serious ozone non-attainment areas, or the 2017 deadline for Severe-15 non-attainment areas, but that the MDAQMD will attain by the 2020 deadline for Severe-17 non-attainment areas.

ARB Weight of Evidence Assessment

Federal modeling guidelines also require non-attainment areas to determine whether other evidence, such as evaluations of air quality and emission trends, support the modeled attainment demonstration. USEPA's ozone modeling guidance also indicates that when photochemical modeling projects attainment year concentrations of between 0.082 and 0.087 ppm, the State may conduct further analyses of the model outcomes and consider other evidence such as emissions and air quality trends data. If the weight of this evidence supports a finding that the proposed control program will result in attainment by the statutory deadline, the State may consider this evidence in determining whether the proposed control program will result in attainment.

CARB has performed a detailed weight of evidence assessment for the attainment demonstration of the MDAQMD portion of the Western Mojave Desert federal ozone nonattainment area. This analysis supports the determination that the MDAQMD portion will attain the Federal 8-hour ozone standard by the 2020 deadline for Severe-17 areas on the basis of reduced transported air pollution from upwind areas. Because the photochemical modeling projected a high value of 88.7 ppm in 2017, the weight of evidence analysis cannot be used to support a projection of attainment by 2017. The ARB Weight of Evidence assessment is presented in Appendix F.

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Appendices

A - Base Year Emission Inventory
B - Future Year Emission Inventories
C - Transportation Conformity Budgets
D - Annual Ambient Monitoring Data Summary
E - ARB Weight of Evidence Assessment

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APPENDIX A - BASE YEAR EMISSION INVENTORY

All emissions are presented in tons per ozone seasonal day (except where noted) for the 2002 base year

	NOx	VOC
Stationary		
ELECTRIC UTILITIES	4.65	0.14
COGENERATION	0.10	0.00
MANUFACTURING AND INDUSTRIAL	2.49	0.15
SERVICE AND COMMERCIAL	2.56	0.21
OTHER (FUEL COMBUSTION)	0.22	0.02
SEWAGE TREATMENT	0.00	0.00
LANDFILLS	0.00	0.11
INCINERATORS	0.06	0.00
OTHER (WASTE DISPOSAL)	0.00	0.02
LAUNDERING	0.00	0.00
DEGREASING	0.00	1.00
COATINGS AND RELATED PROCESS SOLVENTS	0.00	0.57
PRINTING	0.00	0.01
ADHESIVES AND SEALANTS	0.00	0.03
OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00
PETROLEUM MARKETING	0.02	2.34
CHEMICAL	0.00	0.21
FOOD AND AGRICULTURE	0.00	0.00
MINERAL PROCESSES	29.95	0.95
METAL PROCESSES	0.50	0.00
WOOD AND PAPER	0.00	0.00
GLASS AND RELATED PRODUCTS	1.58	0.00
OTHER (INDUSTRIAL PROCESSES)	0.06	0.21
Stationary Subtotal	**42.18**	**5.97**
Area-Wide		
CONSUMER PRODUCTS	0.00	2.78
ARCHITECTURAL COATINGS AND RELATED PROCESS SC	0.00	1.53
PESTICIDES/FERTILIZERS	0.00	0.02
ASPHALT PAVING / ROOFING	0.00	0.31
RESIDENTIAL FUEL COMBUSTION	0.45	0.15
FARMING OPERATIONS	0.00	0.72
CONSTRUCTION AND DEMOLITION	0.00	0.00
PAVED ROAD DUST	0.00	0.00
UNPAVED ROAD DUST	0.00	0.00
FUGITIVE WINDBLOWN DUST	0.00	0.00
FIRES	0.00	0.01
MANAGED BURNING AND DISPOSAL	0.17	0.42
COOKING	0.00	0.61
Area-Wide Subtotal	**0.62**	**6.55**
On-Road Mobile		
LIGHT DUTY PASSENGER (LDA)	6.28	6.11
LIGHT DUTY TRUCKS - 1 (LDT1)	4.12	3.31
LIGHT DUTY TRUCKS - 2 (LDT2)	4.20	2.35
MEDIUM DUTY TRUCKS (MDV)	1.60	0.80
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.34	0.25
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.21	0.16
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.20	0.23
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.53	0.14
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.02	0.00
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.46	0.01
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	1.58	0.02
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	53.57	3.75
MOTORCYCLES (MCY)	0.19	0.93
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.07	0.00
HEAVY DUTY GAS URBAN BUSES (UB)	0.05	0.02
SCHOOL BUSES (SB)	0.41	0.03
OTHER BUSES (OB)	0.12	0.02
MOTOR HOMES (MH)	0.29	0.07
On-Road Subtotal	**74.24**	**18.20**
Other Mobile		
AIRCRAFT	0.16	0.13
TRAINS	29.20	2.19
RECREATIONAL BOATS	0.07	0.46
OFF-ROAD RECREATIONAL VEHICLES	0.23	10.61
OFF-ROAD EQUIPMENT	5.02	1.90
FARM EQUIPMENT	0.48	0.10
FUEL STORAGE AND HANDLING	0.00	0.58
Other Mobile Subtotal	**35.15**	**15.98**
FONA Totals:	**152.19**	**46.69**

FONA Point Sources for 2002 (all emissions in tons per year)

			ROG	NOx
Aerochem Inc	Aerospace	El Mirage	0.9	176.7
Lockheed Martin	Aerospace	Helendale	0.3	0.2
SCLA	Aerospace	Victorville	0.0	0.5
		Aerospace Totals:	*1.2*	*177.4*
Agcon Inc	Batch Plant	Helendale	0.0	0.0
Blue Diamond Materials	Batch Plant	Victorville	0.0	0.0
Calmat Vulcan	Batch Plant	Oro Grande	2.0	6.3
Cornerstone C&M	Batch Plant	Victorville	0.0	0.0
Dan Copp Crushing	Batch Plant	Barstow	0.0	1.2
Diversified Materials	Batch Plant	Hesperia	0.0	0.0
Diversified Materials	Batch Plant	Lucerne Valley	0.0	0.5
Granite Construction	Batch Plant	Twentynine Palms	0.0	0.0
Hanson Aggregate	Batch Plant	Newberry Springs	25.4	168.4
Hi-Grade Materials	Batch Plant	Hesperia	0.0	0.0
Hi-Grade Materials	Batch Plant	Lucerne Valley	0.9	13.7
Kinne Limestone	Batch Plant	Lucerne Valley	0.2	2.6
Robertson's Readymix	Batch Plant	Adelanto	0.1	0.8
Service Rock Products	Batch Plant	Barstow	0.0	0.0
Sierra Aggregate	Batch Plant	Lucerne Valley	0.6	6.9
		Batch Plant Totals:	*29.2*	*200.4*
Cemex Black Mountain Quarry	Cement Manufacturing	Apple Valley	63.3	5383.0
Cemex River Plant	Cement Manufacturing	Victorville	0.0	0.0
Mitsubishi Cement	Cement Manufacturing	Lucerne Valley	17.1	2244.8
TXI Riverside Cement	Cement Manufacturing	Oro Grande	77.4	4186.0
		Cement Manufacturing Totals:	*157.8*	*11813.8*
California Cogeneration	Electric Generation	Victorville	0.0	5.5
Daggett Leasing	Electric Generation	Daggett	6.3	13.0
Harper Lake	Electric Generation	Harper Lake	17.5	23.5
Kramer Junction	Electric Generation	Boron	15.3	62.0
Reliant Energy	Electric Generation	Daggett	15.8	909.5
SCE Victorville	Electric Generation	Victorville	0.0	0.4
US West Financing	Electric Generation	Oro Grande	0.7	35.8
		Electric Generation Totals:	*55.6*	*1049.7*
Cabo Yachts	Fiberglass	Adelanto	18.9	0.0
Hawaiian Fiberglass	Fiberglass	Adelanto	5.6	0.0
Kormil Industries	Fiberglass	Hesperia	1.8	0.0
May Manufacturing	Fiberglass	Victorville	7.1	0.0
Molded Fiber Glass	Fiberglass	Adelanto	16.1	0.0
Pacific Tank	Fiberglass	Adelanto	4.0	0.0
Rainbow Fiberglass	Fiberglass	Adelanto	18.4	0.0
		Fiberglass Totals:	*71.9*	*0.0*
AFG Industries	Glass Manufacturing	Victorville	0.1	578.5
Desert Valley Hospital	Institution	Victorville	0.3	0.7
Hi Desert Medical	Institution	Joshua Tree	0.0	0.7
St. Mary Hospital	Institution	Apple Valley	0.3	4.7
Veterans Home of Barstow	Institution	Barstow	0.1	1.1
Victor Valley Community Hospital	Institution	Victorville	0.1	3.2
Victor Valley Memorial	Institution	Victorville	0.1	0.0
		Institution Totals:	*0.9*	*10.4*

AFFTC Edwards	Military	Edwards	0.0	0.1
US Army Dagget Airfield	Military	Daggett	1.1	1.3
USMC Logistics Base Nebo	Military	Barstow	5.4	11.5
USMC Logistics Base Yermo	Military	Barstow	20.2	35.3
USMCAGCC	Military	Twentynine Palms	3.5	17.3
		Military Totals:	*30.2*	*65.5*
Brubaker-Mann	Mining	Barstow	0.0	0.0
Calico Rock	Mining	Barstow	0.0	0.0
OMYA	Mining	Lucerne Valley	0.1	1.1
Rheox	Mining	Newberry Springs	0.2	9.1
Specialty Minerals	Mining	Lucerne Valley	0.1	1.5
Victorville Industrial Minerals	Mining	Oro Grande	0.0	0.0
		Mining Totals:	*0.4*	*11.7*
Advance Disposal	Misc Coating/Manuf	Hesperia	0.3	0.0
Alrayco	Misc Coating/Manuf	Adelanto	0.0	4.7
Daily Press	Misc Coating/Manuf	Victorville	1.5	0.0
Ennis Paint	Misc Coating/Manuf	Adelanto	0.0	0.0
Fast Tops	Misc Coating/Manuf	Hesperia	15.1	0.0
Induction Technology	Misc Coating/Manuf	Adelanto	0.4	0.0
Jack B. Kelly	Misc Coating/Manuf	Adelanto	0.7	0.0
JPM Product	Misc Coating/Manuf	Hesperia	0.5	0.1
Labelhouse	Misc Coating/Manuf	Adelanto	2.1	0.0
Lead Masters	Misc Coating/Manuf	Hesperia	0.0	0.0
McWelco Products	Misc Coating/Manuf	Hesperia	2.9	0.0
Mobile Pipe Wrap	Misc Coating/Manuf	Adelanto	14.6	0.2
National Arnold Magnetics	Misc Coating/Manuf	Adelanto	13.5	0.8
Northwest Pipe & Casing	Misc Coating/Manuf	Adelanto	11.5	0.0
Sherwin-Williams	Misc Coating/Manuf	Victorville	32.5	0.0
Simtec	Misc Coating/Manuf	Hesperia	0.1	0.0
Spede Tool Mfg	Misc Coating/Manuf	Adelanto	0.9	0.8
Spede Tool Mfg	Misc Coating/Manuf	Adelanto	4.6	0.0
Technique Design	Misc Coating/Manuf	Morongo Valley	0.2	0.0
TPS Technologies	Misc Coating/Manuf	Adelanto	0.2	15.7
World of Leisure	Misc Coating/Manuf	Adelanto	6.9	0.1
		Misc Coating/Manuf Totals:	*108.5*	*22.4*
PG&E Hinkley	Natural Gas Transmission	Hinkley	70.1	578.7
SCG Adelanto	Natural Gas Transmission	Adelanto	0.5	32.8
SCG Kelso	Natural Gas Transmission	Kelso	0.5	80.4
SCG Newberry Springs	Natural Gas Transmission	Newberry Springs	3.0	171.5
SCG Victorville	Natural Gas Transmission	Victorville	0.1	0.0
		Natural Gas Transmission Totals:	*74.2*	*863.4*
Accent Auto Body	Paint & Body	Hesperia	0.6	0.0
Best Auto Body	Paint & Body	Hesperia	0.1	0.0
Daves Auto Body	Paint & Body	Lenwood	0.1	0.0
Doman Auto Body	Paint & Body	Hesperia	0.2	0.0
Mc Geez Auto Body	Paint & Body	Twentynine Palms	1.4	0.0
Monty's Chevrolet	Paint & Body	Victorville	1.0	0.0
Pacific Paint	Paint & Body	Hesperia	0.2	0.0
Rancho Motors	Paint & Body	Victorville	0.3	0.0
Sonshine Auto Body	Paint & Body	Victorville	1.0	0.0
Sunland Ford	Paint & Body	Victorville	0.2	0.0
Sunset Paint and Body	Paint & Body	Hesperia	1.7	0.0
Yucca Auto Body	Paint & Body	Yucca Valley	1.0	0.0
Yucca Valley Ford	Paint & Body	Yucca Valley	0.3	0.0
		Paint & Body Totals:	*8.1*	*0.0*

Beck Oil	Petroleum Pipeline & Terminal	Victorville	0.6	0.0
CalNev Bulk Plant	Petroleum Pipeline & Terminal	Daggett	35.1	0.0
	Petroleum Pipeline & Terminal Totals:		*35.7*	*0.0*
Barstow Railyard	Railroad Switching	Barstow	6.4	0.9
City of Barstow	Wastewater/Landfill/Water	Barstow	0.2	37.8
Lenwood Hinkley	Wastewater/Landfill/Water	Hinkley	0.1	0.8
Victor Valley Wastewater Treatment	Wastewater/Landfill/Water	Victorville	0.0	1.5
	Wastewater/Landfill/Water Totals:		*0.3*	*40.1*
C&M Wood Industries	Wood Coating	Hesperia	6.9	1.2
Commercial Wood Products	Wood Coating	Adelanto	7.9	0.0
Hacker Wallsystems	Wood Coating	Yucca Valley	0.1	0.0
Inland Panel Coatings	Wood Coating	Adelanto	20.9	0.0
Mueller Turner	Wood Coating	Morongo Valley	1.3	0.0
Terrell Industries	Wood Coating	Hesperia	13.3	0.0
Walnut Valley Finishing	Wood Coating	Adelanto	26.7	1.9
	Wood Coating Totals:		*77.1*	*3.1*
FONA		Totals (tpy):	657.6	14837.3
		Totals (tpaad):	**1.80**	**40.65**

APPENDIX B - FUTURE YEAR EMISSION INVENTORIES

(all emissions in tons per ozone seasonal day unless otherwise indicated)

VOC:

SUBCATEGORY	2002	2008	2011	2014	2017	2020
Stationary						
ELECTRIC UTILITIES	0.14	0.20	0.21	0.21	0.23	0.27
COGENERATION	0.00	0.00	0.00	0.00	0.00	0.00
MANUFACTURING AND INDUSTRIAL	0.15	0.16	0.17	0.18	0.19	0.19
SERVICE AND COMMERCIAL	0.21	0.21	0.21	0.21	0.21	0.21
OTHER (FUEL COMBUSTION)	0.02	0.02	0.02	0.02	0.02	0.02
SEWAGE TREATMENT	0.00	0.00	0.00	0.00	0.00	0.00
LANDFILLS	0.11	0.13	0.13	0.14	0.15	0.15
INCINERATORS	0.00	0.00	0.00	0.00	0.01	0.01
OTHER (WASTE DISPOSAL)	0.02	0.02	0.02	0.02	0.03	0.03
LAUNDERING	0.00	0.00	0.00	0.00	0.00	0.00
DEGREASING	1.00	1.00	1.04	1.08	1.11	1.15
COATINGS AND RELATED PROCESS SOLVENTS	0.57	0.62	0.65	0.69	0.72	0.75
PRINTING	0.01	0.01	0.01	0.01	0.01	0.01
ADHESIVES AND SEALANTS	0.03	0.03	0.04	0.04	0.04	0.05
OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00	0.00	0.00	0.00	0.00
PETROLEUM MARKETING	2.34	2.59	2.72	2.85	2.99	3.13
CHEMICAL	0.21	0.25	0.27	0.29	0.30	0.32
FOOD AND AGRICULTURE	0.00	0.00	0.00	0.00	0.00	0.00
MINERAL PROCESSES	0.95	1.05	1.11	1.17	1.23	1.29
METAL PROCESSES	0.00	0.00	0.00	0.00	0.00	0.00
WOOD AND PAPER	0.00	0.00	0.00	0.00	0.00	0.00
GLASS AND RELATED PRODUCTS	0.00	0.00	0.00	0.00	0.00	0.00
OTHER (INDUSTRIAL PROCESSES)	0.21	0.22	0.25	0.25	0.28	0.31
Stationary Subtotal	**5.97**	**6.53**	**6.85**	**7.18**	**7.52**	**7.89**
Area-Wide						
CONSUMER PRODUCTS	2.78	2.80	3.01	3.22	3.43	3.64
ARCHITECTURAL COATINGS AND RELATED PROCES	1.53	1.37	1.41	1.46	1.51	1.57
PESTICIDES/FERTILIZERS	0.02	0.02	0.02	0.02	0.02	0.02
ASPHALT PAVING / ROOFING	0.31	0.32	0.32	0.32	0.33	0.33
RESIDENTIAL FUEL COMBUSTION	0.15	0.16	0.17	0.17	0.18	0.18
FARMING OPERATIONS	0.72	0.72	0.72	0.72	0.72	0.72
CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.00	0.00
PAVED ROAD DUST	0.00	0.00	0.00	0.00	0.00	0.00
UNPAVED ROAD DUST	0.00	0.00	0.00	0.00	0.00	0.00
FUGITIVE WINDBLOWN DUST	0.00	0.00	0.00	0.00	0.00	0.00
FIRES	0.01	0.01	0.01	0.01	0.01	0.01
MANAGED BURNING AND DISPOSAL	0.42	0.37	0.35	0.33	0.31	0.28
COOKING	0.61	0.68	0.72	0.75	0.79	0.82
Area-Wide Subtotal	**6.55**	**6.46**	**6.74**	**7.01**	**7.30**	**7.58**
On-Road Mobile						
LIGHT DUTY PASSENGER (LDA)	6.11	3.75	2.84	2.07	1.63	1.34
LIGHT DUTY TRUCKS - 1 (LDT1)	3.31	2.06	1.68	1.31	1.00	0.79
LIGHT DUTY TRUCKS - 2 (LDT2)	2.35	1.77	1.54	1.29	1.14	1.03
MEDIUM DUTY TRUCKS (MDV)	0.80	0.77	0.69	0.64	0.59	0.56
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.25	0.18	0.15	0.13	0.14	0.15
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.16	0.10	0.09	0.07	0.07	0.06
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.23	0.11	0.08	0.06	0.04	0.03
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.14	0.09	0.08	0.07	0.05	0.05
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.01	0.01	0.01	0.01	0.01
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.01	0.01	0.01	0.01	0.01	0.01
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.02	0.02	0.02	0.02	0.02	0.02
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	3.75	3.80	3.28	2.52	1.92	1.54
MOTORCYCLES (MCY)	0.93	1.88	1.84	1.88	1.98	2.08
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.00	0.00	0.00	0.00	0.00	0.00
HEAVY DUTY GAS URBAN BUSES (UB)	0.02	0.02	0.02	0.02	0.02	0.02
SCHOOL BUSES (SB)	0.03	0.03	0.03	0.03	0.03	0.03
OTHER BUSES (OB)	0.02	0.02	0.02	0.02	0.02	0.01
MOTOR HOMES (MH)	0.07	0.05	0.04	0.03	0.02	0.01
On-Road Subtotal	**18.20**	**14.67**	**12.42**	**10.18**	**8.70**	**7.75**
Other Mobile						
AIRCRAFT	0.13	0.16	0.17	0.19	0.20	0.21
TRAINS	2.19	2.24	2.29	2.35	2.43	2.52
RECREATIONAL BOATS	0.46	0.39	0.35	0.33	0.31	0.30
OFF-ROAD RECREATIONAL VEHICLES	10.61	15.28	16.82	18.61	20.65	22.94
OFF-ROAD EQUIPMENT	1.90	1.67	1.48	1.32	1.21	1.15
FARM EQUIPMENT	0.10	0.08	0.06	0.05	0.04	0.03
FUEL STORAGE AND HANDLING	0.58	0.40	0.33	0.28	0.24	0.22
Other Mobile Subtotal	**15.98**	**20.23**	**21.50**	**23.12**	**25.07**	**27.37**
Grand Total	**46.69**	**47.89**	**47.51**	**47.50**	**48.60**	**50.58**

NOx:

SUBCATEGORY	2002	2008	2011	2014	2017	2020
Stationary						
ELECTRIC UTILITIES	4.65	6.75	7.00	7.00	7.79	8.98
COGENERATION	0.10	0.10	0.10	0.10	0.10	0.09
MANUFACTURING AND INDUSTRIAL	2.49	2.76	2.88	3.03	3.16	3.28
SERVICE AND COMMERCIAL	2.56	2.59	2.58	2.57	2.54	2.50
OTHER (FUEL COMBUSTION)	0.22	0.24	0.24	0.24	0.24	0.24
SEWAGE TREATMENT	0.00	0.00	0.00	0.00	0.00	0.00
LANDFILLS	0.00	0.00	0.00	0.00	0.00	0.00
INCINERATORS	0.06	0.06	0.07	0.07	0.07	0.08
OTHER (WASTE DISPOSAL)	0.00	0.00	0.00	0.00	0.00	0.00
LAUNDERING	0.00	0.00	0.00	0.00	0.00	0.00
DEGREASING	0.00	0.00	0.00	0.00	0.00	0.00
COATINGS AND RELATED PROCESS SOLVENTS	0.00	0.00	0.00	0.00	0.00	0.00
PRINTING	0.00	0.00	0.00	0.00	0.00	0.00
ADHESIVES AND SEALANTS	0.00	0.00	0.00	0.00	0.00	0.00
OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00	0.00	0.00	0.00	0.00
PETROLEUM MARKETING	0.02	0.02	0.02	0.02	0.02	0.02
CHEMICAL	0.00	0.00	0.00	0.00	0.00	0.00
FOOD AND AGRICULTURE	0.00	0.00	0.00	0.00	0.00	0.00
MINERAL PROCESSES	29.95	32.74	34.35	36.11	37.78	39.36
METAL PROCESSES	0.50	0.49	0.52	0.55	0.58	0.61
WOOD AND PAPER	0.00	0.00	0.00	0.00	0.00	0.00
GLASS AND RELATED PRODUCTS	1.58	1.72	1.90	2.08	2.19	2.33
OTHER (INDUSTRIAL PROCESSES)	0.06	0.06	0.06	0.06	0.07	0.08
Stationary Subtotal	**42.18**	**47.53**	**49.72**	**51.84**	**54.55**	**57.56**
Area-Wide						
CONSUMER PRODUCTS	0.00	0.00	0.00	0.00	0.00	0.00
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVEN	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES/FERTILIZERS	0.00	0.00	0.00	0.00	0.00	0.00
ASPHALT PAVING / ROOFING	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL FUEL COMBUSTION	0.45	0.48	0.49	0.50	0.52	0.53
FARMING OPERATIONS	0.00	0.00	0.00	0.00	0.00	0.00
CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.00	0.00
PAVED ROAD DUST	0.00	0.00	0.00	0.00	0.00	0.00
UNPAVED ROAD DUST	0.00	0.00	0.00	0.00	0.00	0.00
FUGITIVE WINDBLOWN DUST	0.00	0.00	0.00	0.00	0.00	0.00
FIRES	0.00	0.00	0.00	0.00	0.00	0.00
MANAGED BURNING AND DISPOSAL	0.17	0.15	0.14	0.14	0.13	0.12
COOKING	0.00	0.00	0.00	0.00	0.00	0.00
Area-Wide Subtotal	**0.62**	**0.63**	**0.64**	**0.64**	**0.65**	**0.65**
On-Road Mobile						
LIGHT DUTY PASSENGER (LDA)	6.28	3.81	2.99	2.23	1.76	1.42
LIGHT DUTY TRUCKS - 1 (LDT1)	4.12	2.38	2.00	1.59	1.24	0.97
LIGHT DUTY TRUCKS - 2 (LDT2)	4.20	3.12	2.65	2.15	1.79	1.50
MEDIUM DUTY TRUCKS (MDV)	1.60	1.57	1.35	1.15	0.99	0.84
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.34	0.36	0.37	0.36	0.36	0.38
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.21	0.13	0.13	0.12	0.12	0.12
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.20	0.14	0.11	0.09	0.07	0.06
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.53	0.35	0.35	0.34	0.35	0.36
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.02	0.59	0.46	0.36	0.30	0.26
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.46	0.57	0.49	0.40	0.32	0.27
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	1.58	1.92	1.68	1.29	0.99	0.78
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	53.57	50.49	42.82	31.83	23.39	18.22
MOTORCYCLES (MCY)	0.19	0.50	0.51	0.54	0.58	0.62
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.07	0.06	0.05	0.05	0.05	0.05
HEAVY DUTY GAS URBAN BUSES (UB)	0.05	0.04	0.04	0.04	0.04	0.04
SCHOOL BUSES (SB)	0.41	0.44	0.47	0.49	0.49	0.48
OTHER BUSES (OB)	0.12	0.14	0.13	0.11	0.09	0.07
MOTOR HOMES (MH)	0.29	0.28	0.26	0.22	0.18	0.14
On-Road Subtotal	**74.24**	**66.88**	**56.86**	**43.37**	**33.12**	**26.57**
Other Mobile						
AIRCRAFT	0.16	0.20	0.21	0.23	0.25	0.26
TRAINS	29.20	22.25	17.07	18.16	19.42	20.85
RECREATIONAL BOATS	0.07	0.10	0.10	0.10	0.11	0.11
OFF-ROAD RECREATIONAL VEHICLES	0.23	0.33	0.37	0.41	0.46	0.51
OFF-ROAD EQUIPMENT	5.02	4.27	3.73	3.18	2.61	2.17
FARM EQUIPMENT	0.48	0.37	0.32	0.26	0.20	0.15
FUEL STORAGE AND HANDLING	0.00	0.00	0.00	0.00	0.00	0.00
Other Mobile Subtotal	**35.15**	**27.52**	**21.81**	**22.35**	**23.04**	**24.05**
Grand Total	**152.19**	**142.56**	**129.03**	**118.20**	**111.35**	**108.83**

APPENDIX C –TRANSPORTATION CONFORMITY BUDGETS

Antelope Valley - Western Mojave Desert Nonattainment Area

Transportation Conformity Budgets
Summer Planning Emissions in Tons per Day*

	2008	
	ROG	NOx
On-Road Emissions from EMFAC2007	22.7	82.0
Adjustments to Baseline*	0.0	-4.4
Net Inventory	22.63	77.56
Conformity Budget**	23	78

* Reductions from adopted rules not reflected in EMFAC
** Budget is obtained by rounding up to the nearest ton.

Antelope Valley - Western Mojave Desert Nonattainment Area

Transportation Conformity Budgets
Summer Planning Emissions in Tons per Day*

	2011	
	ROG	NOx
On-Road Emissions from EMFAC2007	19.8	70.5
Adjustments to Baseline*	-0.1	-4.4
Net Inventory	19.7	66.1
Conformity Budget**	20	67

* Reductions from adopted rules not reflected in EMFAC
** Budget is obtained by rounding up from two significant figures to the nearest ton.

Antelope Valley - Western Mojave Desert Nonattainment Area

Transportation Conformity Budgets
Summer Planning Emissions in Tons per Day*

	2014	
	ROG	NOx
On-Road Emissions from EMFAC2007	16.6	54.9
Adjustments to Baseline*	-0.1	-4.1
State Strategy Reductions	-3.4	-15.3
Net Inventory	13.0	35.5
Conformity Budget**	14	36

* Reductions from adopted rules not reflected in EMFAC
** Budget is obtained by rounding up from two significant figures to the nearest ton.

Antelope Valley - Western Mojave Desert Nonattainment Area

Transportation Conformity Budgets
Summer Planning Emissions in Tons per Day*

	2017	
	ROG	NOx
On-Road Emissions from EMFAC2007	14.5	43.1
Adjustments to Baseline*	-0.1	-3.9
State Strategy Reductions	-2.5	-14.1
Net Inventory	11.9	25.1
Conformity Budget**	12	26

* Reductions from adopted rules not reflected in EMFAC
** Budget is obtained by rounding up from two significant figures to the nearest ton.

Antelope Valley - Western Mojave Desert Nonattainment Area

Transportation Conformity Budgets
Summer Planning Emissions in Tons per Day*

	2020	
	ROG	NOx
On-Road Emissions from EMFAC2007	13.2	35.4
Adjustments to Baseline*	-0.1	-3.7
State Strategy Reductions	-1.7	-7.4
Net Inventory	11.4	24.2
Conformity Budget**	12	25

* Reductions from adopted rules not reflected in EMFAC

** Budget is obtained by rounding up from two significant figures to the nearest ton.

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APPENDIX D - ANNUAL AMBIENT MONITORING DATA SUMMARY

	Maximum One Hour Ozone (ppm)					
	Barstow	Hesperia	Phelan	Trona	Twentynine Palms	Victorville
1988	0.15	0.27	0.19	0.12	0.15	0.18
1989	0.14	0.21	0.22	0.10	0.13	0.17
1990	0.13	0.27	0.24	0.11	0.14	0.18
1991	0.13	0.19	0.24	0.12	0.14	0.19
1992	0.13	0.23	0.19	0.10	0.12	0.19
1993	0.13	0.17	0.20	0.10	0.13	0.16
1994	0.13	0.18	0.19	0.10	0.12	0.16
1995	0.12	0.17	0.24	0.09	0.11	0.15
1996	0.13	0.17	0.18	0.10	0.12	0.16
1997	0.12	0.18	0.19	0.10	0.12	0.15
1998	0.11	0.16	0.20	0.11	0.12	0.16
1999	0.12	0.13	0.14	0.10	0.11	0.12
2000	0.11	0.16	0.14	0.09	0.11	0.14
2001	0.10	0.12	0.15	0.09	0.12	0.11
2002	0.11	0.15	0.15	0.11	0.10	0.13
2003	0.11	0.16	0.14	0.10	0.10	0.15
2004	0.10	0.14	0.12	0.11	0.10	0.11
2005	0.10	0.14	0.15	0.09	0.11	0.13
2006	0.11	0.15	0.14	0.09		0.14

8-Hour Trend (FONA)		
	Maximum	3-Yr Av 4th H
1986	0.225	0.168
1987	0.161	0.163
1988	0.167	0.165
1989	0.161	0.153
1990	0.198	0.151
1991	0.173	0.151
1992	0.165	0.147
1993	0.147	0.139
1994	0.155	0.138
1995	0.170	0.137
1996	0.146	0.131
1997	0.133	0.124
1998	0.144	0.127
1999	0.122	0.118
2000	0.132	0.110
2001	0.117	0.102
2002	0.123	0.106
2003	0.13	0.106
2004	0.119	0.107
2005	0.123	0.105
2006	0.124	0.103

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APPENDIX E – ARB WEIGHT OF EVIDENCE ASSESSMENT

(prepared by CARB staff)

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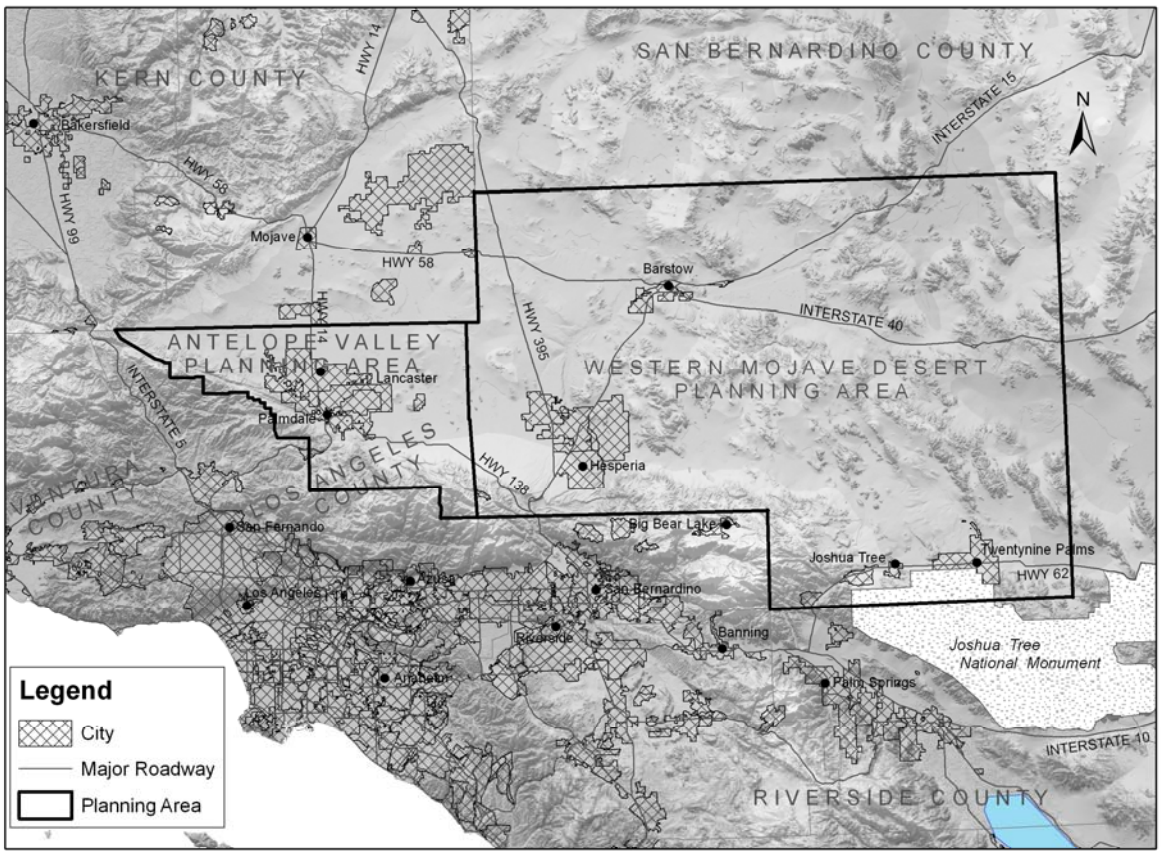
Western Mojave Desert Weight of Evidence Assessment

Introduction

For ozone planning purposes, the U.S. EPA has combined portions of Los Angeles and San Bernardino counties and designated them as the Western Mojave 8-Hour Ozone Nonattainment Area. The Nonattainment Area includes the northeast portion of Los Angeles County and the southwest portion of San Bernardino County, both of which are in the Mojave Desert Air Basin (refer to Figure 1). These two areas are managed by two separate jurisdictions. The Antelope Valley Air Quality Management District has jurisdiction over the Los Angeles County portion of the Nonattainment Area, while the Mojave Desert Air Quality Management District has jurisdiction over the San Bernardino County portion of the Nonattainment Area. This Weight of Evidence (WOE) evaluation covers the San Bernardino County portion of the Nonattainment Area which is referred to as the Western Mojave Desert Planning Area in this document.

Figure 1: Western Mojave Desert Planning Area and Surrounding Region



The Western Mojave Desert Planning Area (Western Mojave Desert or Planning Area) is currently classified as a Moderate nonattainment area for the federal 8-hour ozone standard and has a nominal attainment deadline of June 15, 2010. However, air quality analyses, as well as photochemical modeling completed by the South Coast Air Quality Management District (South Coast District), indicate it is unlikely the Desert will attain by 2010, as required for Moderate areas. Ozone air quality in the Western Mojave Desert is impacted by transport from both the South Coast Air Basin (South Coast) and the San Joaquin Valley Air Basin (San Joaquin Valley). As a result, attainment projections for Western Mojave Desert must consider not only local emissions, but also the impact of transported emissions and pollutants.

Although the proposed South Coast, San Joaquin Valley, and statewide emissions reduction strategies will lower ozone concentrations in the Western Mojave Desert over the next several years, the expected level of emissions reductions will fall short of those needed to attain by 2010. However, the modeling results do show that the Planning Area could attain by the 2021 deadline for a Severe-17 nonattainment area. Therefore, the Mojave Desert Air Quality Management District has requested a reclassification to Severe-17, with an attainment date of June 15, 2021. The following sections describe the air quality and emissions analyses needed to justify reclassifying the Western Mojave Desert Planning Area as Severe-17 and to support the overall conclusion that the Planning Area will attain the federal standard by 2021.

U.S. EPA Attainment Demonstration Requirements

The attainment demonstration portion of a SIP consists of the analyses used to determine whether a proposed control strategy provides the emissions reductions needed to meet the federal standard by the attainment year. This attainment demonstration includes photochemical modeling which predicts that projected emissions controls will result in an 8-hour ozone design value of 0.082 parts per million (ppm) by the end of 2020 (note: because the design value is based on a three-year average, an area must have a design value that meets the standard at the end of the year prior to the attainment year; for example, an area with a June 15, 2021 attainment date must have a design value that meets the standard at the end of 2020). Because of the uncertainties inherent in photochemical modeling, the U.S. EPA allows states to supplement the modeling results with a “Weight of Evidence” (WOE) demonstration when the model predicts ozone levels of 0.082 ppm to 0.087 ppm.

The WOE assessment may include consideration of measured air quality, emissions, and meteorological data, evaluation of other air quality indicators, and additional air quality modeling. Because all analysis methods have strengths and weaknesses, examining an air quality problem in a variety of ways helps offset the limitations and uncertainties that are inherent in each particular method.
The scope of the WOE analysis is different for each nonattainment area. The level of detail appropriate for a particular area depends upon the complexity of the air quality problem, how far into the future the attainment deadline is, and the amount of data and

modeling available. This document summarizes the analyses that comprise the WOE assessment for the Western Mojave Desert Planning Area as of March 2008.

Physical Context

The Western Mojave Desert Planning Area (refer to Figure 1) is located in southwestern San Bernardino County, within the Mojave Desert Air Basin and falls under the jurisdiction of the Mojave Desert Air Quality Management District.
Although the Western Mojave Desert Planning Area is the focus of this WOE Evaluation, on the federal level, the Western Mojave Desert Planning Area is included with the Antelope Valley Planning Area as a single federal 8-hour ozone nonattainment area.

The Western Mojave Desert area extends about 90 miles north to south and 120 miles east to west. The Planning Area is classified as high desert with elevations ranging from 2,000 to 5,000 feet and annual precipitation averaging 4 to 6 inches. Average daily maximum temperatures are highest during July, ranging from 100 to 105 degrees Fahrenheit. In contrast, winter daily maximum temperatures average in the low 60s.

The Western Mojave Desert is a recreational area and given its proximity to the South Coast, provides a transportation link to the urbanized area. Major cities in the Planning Area include Victorville, Hesperia, Apple Valley, and Twentynine Palms. Overall, the Planning Area comprises about 9200 square miles and has a total population of more than 350,000 (2006 estimate). The major highways traveling through the Western Mojave Desert are Interstate 15, Interstate 40, U.S. Highway 395, and California State Highway 58. These roadways carry significant commuter and truck traffic in and out of the South Coast region.

Transport Impacts

As mentioned earlier, ozone concentrations in the Western Mojave Desert are impacted by transport from both the South Coast and San Joaquin Valley. Therefore, transport must be considered in evaluating the prospects for attainment. Several mountain passes provide transport routes into the Western Mojave Desert from the South Coast. Soledad Canyon on the eastern edge of the San Gabriel Mountains and Cajon Pass between the San Gabriel and San Bernardino mountains are the two major transport corridors from the South Coast to the Western Mojave Desert. A third transport corridor runs through the Tehachapi Pass in the Tehachapi Mountains and provides an outlet for emissions and pollutants from the southern San Joaquin Valley to the Western Mojave Desert.

Previous ARB transport assessments concluded that during 1-hour State ozone exceedances, the transport contribution from the South Coast to ozone in the Western Mojave Desert could be overwhelming. The transport assessments also found there

could be a shared impact between the South Coast and Western Mojave Desert, meaning ozone exceedances could be caused by a combination of transport and local emissions (ARB 1990; ARB 1996)[7, 8]. In addition to the South Coast impact, the ARB transport assessments found an overwhelming transport impact from the San Joaquin Valley to the Western Mojave Desert.

Although the impact of transport on ozone air quality in the Western Mojave Desert can be overwhelming, the frequency of the impacts has not been determined. However, more recent analyses indicate that ozone exceedances in the Western Mojave Desert continue to be impacted by transported pollutants. Areas impacted by transport generally show ozone concentrations peaking in the late afternoon or evening hours. The 24-hour ozone profile for Hesperia, which is located in the southwestern portion of the Planning Area, just north of the South Coast (refer to Figure 2), shows this characteristic later peak, indicating that transport is an important contributor to high ozone concentrations in this area.

The impact of transport is also seen in the southeastern portion of the Planning Area. Figure 3 shows diurnal plots of hourly average ozone concentrations at Banning in the South Coast, Palm Springs in the Coachella Valley Planning Area, and Joshua Tree in the Western Mojave Desert Planning Area (refer to Figure 1 for relative locations). These three sites reflect a general west-to-east transport of emissions and pollutants. As shown in Figure 3, the daily peak ozone concentration occurs at a progressively later hour with distance downwind of the major South Coast emissions source areas. This progressively later peak hour with distance suggests that transport is the primary cause of high ozone at the downwind locations. Therefore, as emissions are reduced in the upwind source areas, ozone air quality in the downwind transport impacted areas should also improve. Recent photochemical modeling completed for the Western Mojave Desert also evaluated the impact of transported emissions on air quality in the Western Mojave Desert. In general, the results showed that without transport, emissions within the Western Mojave Desert would likely not be sufficient to generate a violation of the federal 8-hour ozone standard in future years.

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[7] Air Resources Board, 1990: Assessment and Mitigation of the Impacts of Transported Pollutants on Ozone Concentrations within California. ARB Staff Report prepared by the Technical Support Division and the Office of Air Quality Planning and Liaison, June 1990.

[8] Air Resources Board, 1996: Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California (Revised). ARB Staff Report prepared by the Technical Support Division, November 1996.

Figure 2: Hourly Average Ozone on the Top Ten Days During 2006 at Hesperia

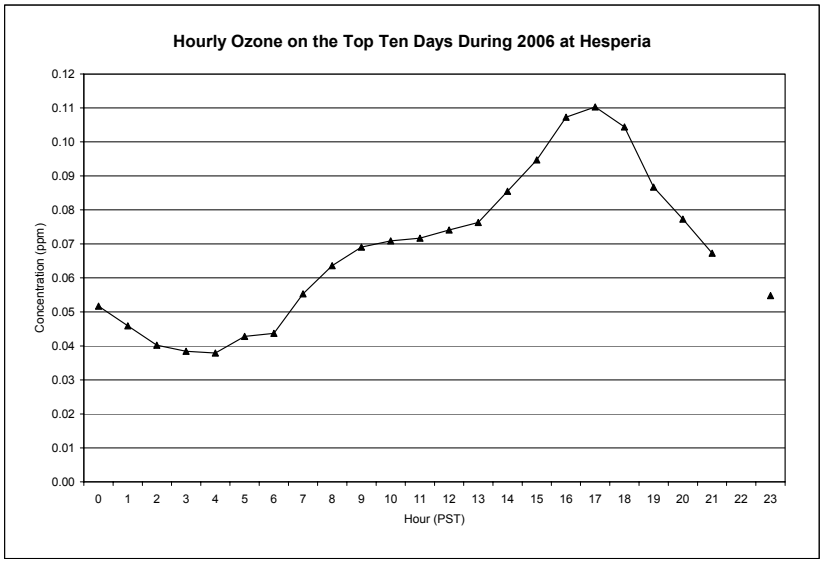
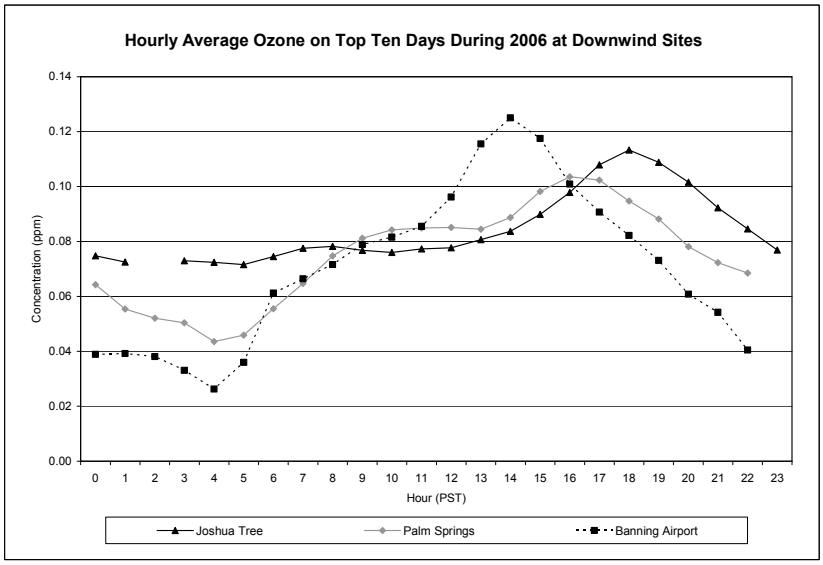


Figure 3: Hourly Average Ozone on the Top Ten Days During 2006 at Banning, Palm Springs, and Joshua Tree



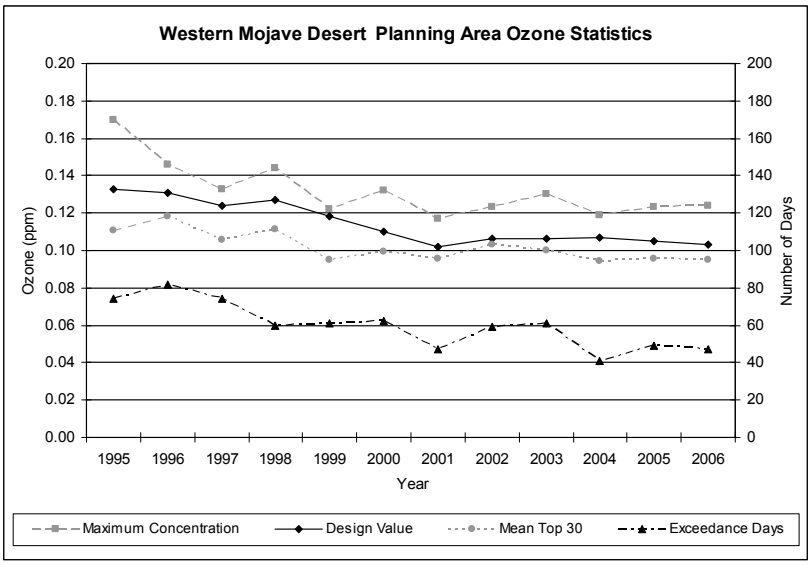
Ozone Air Quality Trends

The following discussion is based on ozone air quality data collected at sites in the Western Mojave Desert from 1995 to the present. During this time period, five monitoring sites have complete data: Barstow, Hesperia-Olive Street, Joshua Tree-National Monument, Phelan-Beekley Road & Phelan Road, and Victorville-14306 Park

Avenue. In addition, a sixth site operated at Twentynine Palms, but data are available only through 2005. Of the six long-term sites, Hesperia, Joshua Tree, and Phelan are the high sites with respect to ozone.

Ozone indicator values for the Western Mojave Desert are shown in Figure 4. As seen in the figure, all indicators have decreased since 1995, indicating overall improvements in the various measures of ozone air quality. As in many other areas of the State, the largest drop is seen in the number of exceedance days – an overall decrease of 35 percent from 1995 to 2006 (from 74 days to 47 days). The value for 2007 is slightly less than that for 2006, with 45 exceedance days during the year.

Figure 4: Western Mojave Desert Planning Area Ozone Trends 1995 to 2006

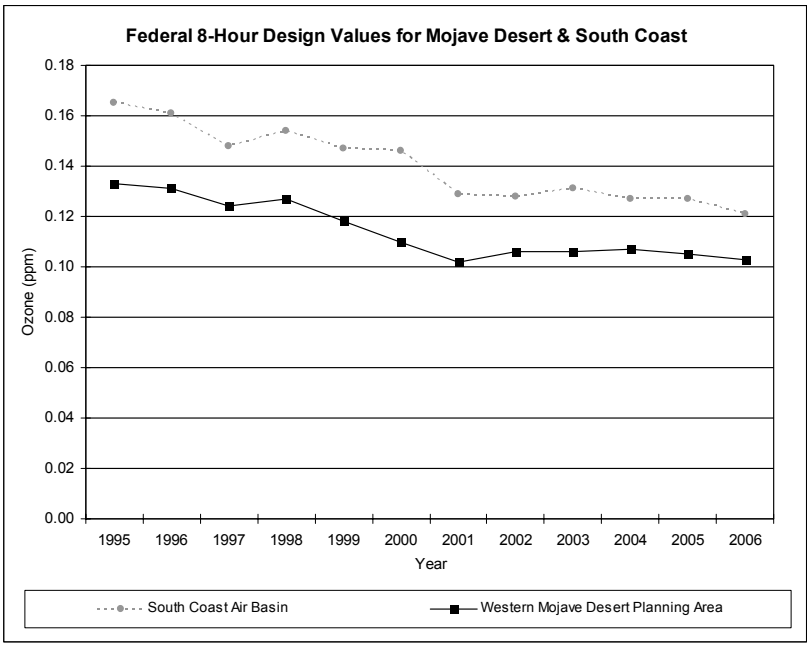


While not quite as high, the improvement in the other indicators has also been fairly substantial. Overall, the maximum concentration and design value decreased 20 and 25 percent, respectively. The decrease in the mean Top 30 was a bit less, at 15 percent between 1995 and 2006. Based on complete data, the 2007 maximum concentration was lower (0.109 ppm in 2007 compared with 0.124 ppm in 2006), while the mean Top 30 concentration was comparable (0.096 ppm in 2007 compared with 0.095 ppm in 2006). The 2007 design value showed no change from the previous year (0.103 ppm in 2007 and 2006). Although the 2007 design value for Western Mojave Desert is still more than 20 percent above the federal standard, it compares with a design value nearly 60 percent above the standard in 1995 (0.133 ppm). Thus, the area has already achieved two-thirds of the progress needed to attain the standard.

It is interesting to note that the Western Mojave Desert trend lines for all four indicators show little or no progress between 2001 and 2006. A similar trend is seen in ozone statistics for the South Coast (refer to Figure 5). As discussed earlier in this document,

emissions and pollutants transported from the South Coast can have an overwhelming impact on ozone in the Western Mojave Desert. Therefore, it is not unexpected that the shapes of the trend lines for the Western Mojave Desert and the South Coast are similar. However, while the South Coast shows a slight decrease from 2001 to 2006, the Western Mojave Desert trend is essentially flat, because of the trend at Joshua Tree.

Figure 5: Federal 8-Hour Ozone Design Values for Western Mojave Desert Planning Area and South Coast Air Basin 1995 to 2006

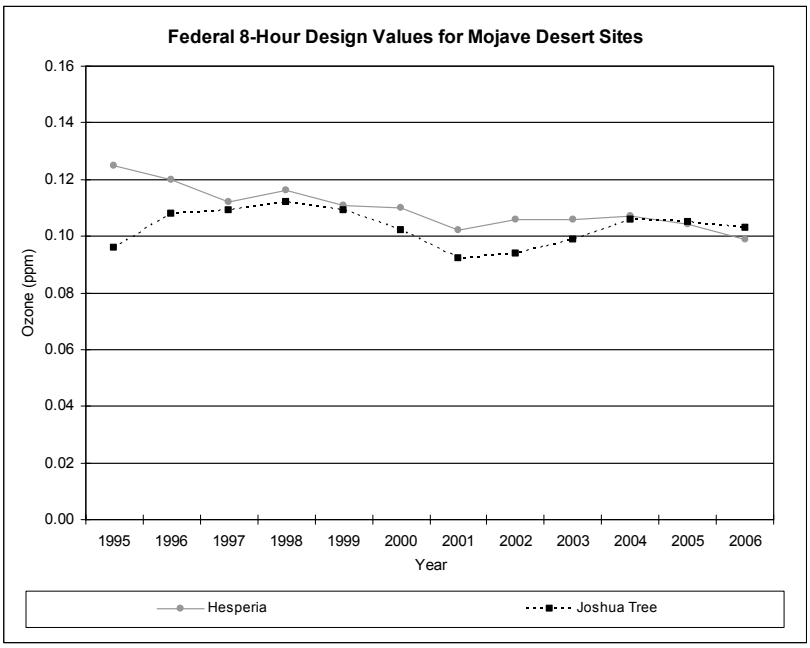


Looking at the design values for individual sites in the Western Mojave Desert gives some insight as to how ozone air quality is changing within the Planning Area and how Joshua Tree compares with other sites. Figure 6 shows the trend lines for Hesperia and Joshua Tree (note: although not shown, the trend line for Phelan is similar to that for Hesperia). The trend line for Hesperia shows an overall reduction in design value, although the decrease since 2001 is slight. In contrast, Joshua Tree shows an overall increase in design value, with the increase being especially apparent since 2001, although the trend has flattened out over the last several years.

While the Joshua Tree and Phelan trends differ, both the trend and level of the design value for Joshua Tree are similar to those for Palm Springs in the Coachella Valley Planning Area. As mentioned previously, both of these sites are located downwind of the South Coast Air Basin. Previous ARB transport assessments show that Palm Springs is overwhelmed by transport from the South Coast. It is likely that Joshua Tree is also impacted by transport, although ARB has not completed a formal assessment.

Given the likelihood of a transport impact, a portion of the increase in the trend at Joshua Tree may be attributable to changing emissions in the South Coast.

Figure 6: Federal 8-Hour Ozone Design Values for Hesperia and Joshua Tree 1995 to 2006

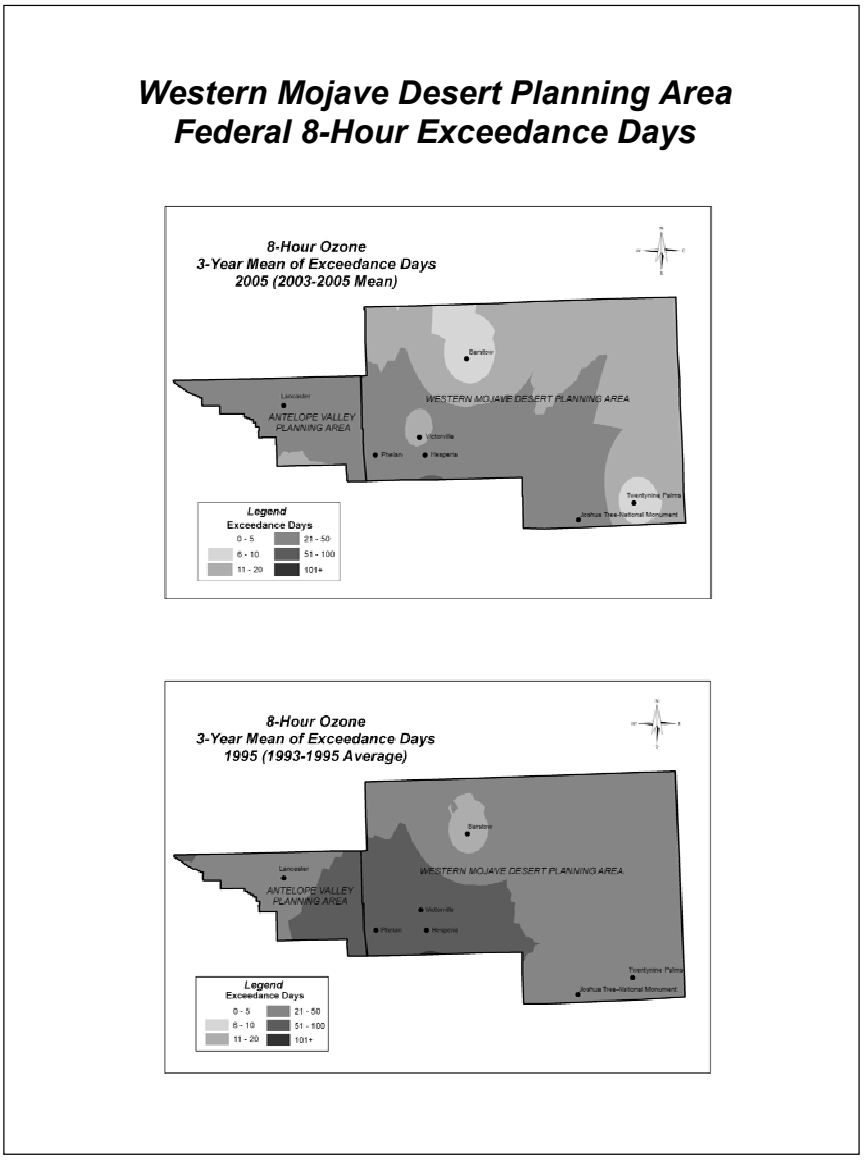


Over time, emissions reductions in the South Coast have reduced the reactivity of the hydrocarbon mix. Because the mix is less reactive now, it takes longer for the photochemical reactions that form ozone to occur. With the reduction in reactivity, ozone concentrations in areas closer to the major South Coast emissions source areas have improved more rapidly than those in downwind areas. Because of the slower rate of improvement, it will take these downwind areas longer to reach attainment. Photochemical modeling analyses indicate that Palm Springs will reach attainment for the federal 8-hour ozone standard by 2018. Because the design value concentrations and trends for Palm Springs and the Western Mojave Desert are so similar, it is reasonable to assume that the Desert will reach attainment in approximately the same timeframe as Palm Springs. Therefore, reclassifying the Western Mojave Desert as Severe-17 with a June 15, 2021 attainment date is appropriate.

Spatial Ozone Trends

Another way to look at the improvement in air quality is to map the change in the number of exceedance days. The maps in Figure 7 are based on monitoring data and show the reduction in the number of days exceeding the federal 8-hour standard over the last decade (1995 to 2005). This approach provides an estimate of the change in the spatial extent of the ozone problem. Ten years ago (1995 map, based on 1993 to 1995 means), about a quarter of the Western Mojave Desert experienced 51 to 100 exceedance days per year, while most of

Figure 7: Western Mojave Desert Planning Area Change in Federal 8-Hour Exceedance Days 1995 to 2005



the remaining areas experienced 21 to 50 days per year. Today (2005 map, based on 2003 to 2005 means), about half of the Desert falls into the 21 to 50 days per year category, with the other half having 11 to 20 days and 6 to 10 days per year. The exceedance day maps clearly illustrate the influence of the South Coast on Western Mojave Desert. The highest number of exceedance days is found in the southwestern portion of the Planning Area, adjacent to the South Coast Air Basin. However, as shown on the maps, air quality in these areas has improved over time, and it should continue to improve with implementation of the South Coast and Statewide emissions control strategies.

Additional Air Quality Analyses

ARB staff conducted additional air quality analyses and also reviewed photochemical modeling for the Western Mojave Desert to assess whether the rate of progress historically, as well as the more modest progress in recent years, supports a 2021 attainment date.

Mean of the Top 30 Analysis

The mean of the Top 30 represents the mean or average of the 30 highest daily maximum 8-hour ozone concentrations measured at a site during each year. Changes in this indicator over time reflect the change in the average ozone concentration on the 30 worst days. Because this indicator is based on a relatively large number of observations, it is more robust than other indicators, such as maximum concentration. Although the mean of the Top 30 is not directly related to the federal standard, it does provide a stable indicator that is not highly influenced by year-to-year changes in meteorology.

Figure 8 shows the trend of the mean of the Top 30 8-hour ozone concentrations for the three high sites in Western Mojave Desert. Since 1995, the mean of the Top 30 declined 10 and 20 percent, respectively, at Hesperia and Phelan. In contrast, the mean Top 30 values increased about 5 percent at Joshua Tree. As a way of gaining further insight into how the mean of the Top 30 has changed over time, ARB staff evaluated the rate of change, relative to the start year (1995) at the same three sites. For this evaluation, three-year averages of the annual mean Top 30 values were normalized to the start year by calculating the ratio of the averaged Top 30 concentration for each year to the 1995 averaged Top 30 concentration. The normalized rate of progress values are plotted in Figure 9.

Hesperia and Phelan both show overall progress during the 12-year period. Although progress has slowed over the last 5 to 6 years, the recent trend is downward, and the 2006 values for both sites are slightly lower than the 2001 values. In contrast, the Joshua Tree site shows an upward trend since 2001. As mentioned earlier (refer to Ozone Air Quality Trends section), the lack of progress at Joshua Tree may be attributable to transport from the South Coast. Because emissions reductions in the

South Coast have reduced the reactivity of the hydrocarbon mix, it now takes longer for ozone to form. As a result, ozone air quality has improved faster in the upwind areas located closer to South Coast emissions source areas than it has in the downwind transport impacted areas. The impact of transport is discussed further in the next section.

Figure 8: Mean of the Top 30 Daily Maximum 8-Hour Ozone Concentrations for Phelan, Hesperia, and Joshua Tree 1995 to 2006

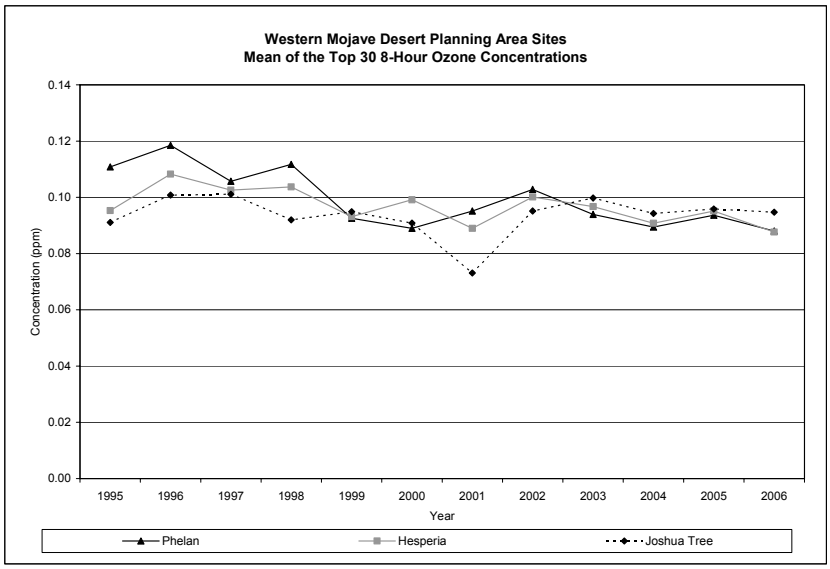
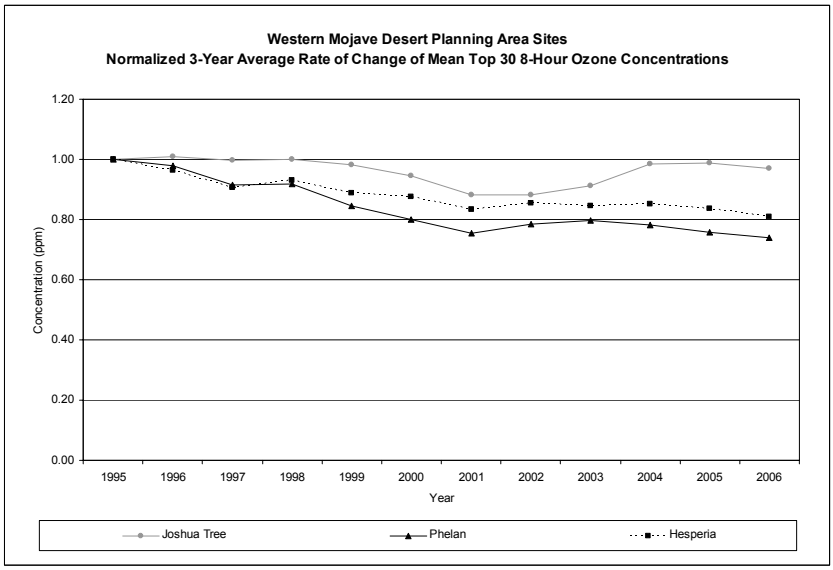


Figure 9: Mean of Top 30 8-Hour Ozone Concentrations at Western Mojave Desert Sites Normalized to 1995 Start Year



Modeling Evaluations and Regression Analyses

As part of the photochemical modeling analyses, South Coast District staff evaluated the impacts of transport on attainment in the Western Mojave Desert. Using a gridded domain, South Coast District staff modeled several emissions reduction scenarios using the two 2005 modeling episodes. The scenarios included (1) removing emissions from the local planning area (Western Mojave Desert and Antelope Valley planning areas); (2) removing emissions from Ventura and Santa Barbara counties, and (3) removing emissions from the South Coast. The results demonstrated that emissions within the Western Mojave Desert Planning Area were not sufficient to generate federal 8-hour ozone exceedances and that the impact of South Coast emissions was overwhelming. Therefore, emissions reductions in the upwind area are critical to the attainment demonstration. Given the results of the modeling evaluations, the current trends at Joshua Tree are not expected to delay the 2021 attainment date for Western Mojave Desert.

As additional analyses, ARB staff completed regression analyses of design values for the South Coast *versus* Western Mojave Desert, as well as the San Joaquin Valley *versus* Western Mojave Desert. Although there are a number of uncertainties associated with these analyses, the results suggest that the design value for the Western Mojave Desert, including the Joshua Tree area, will reach the level of attainment before either the South Coast or San Joaquin Valley, both of which have a 2024 attainment date. This lends further support to the 2021 attainment date for Western Mojave Desert.

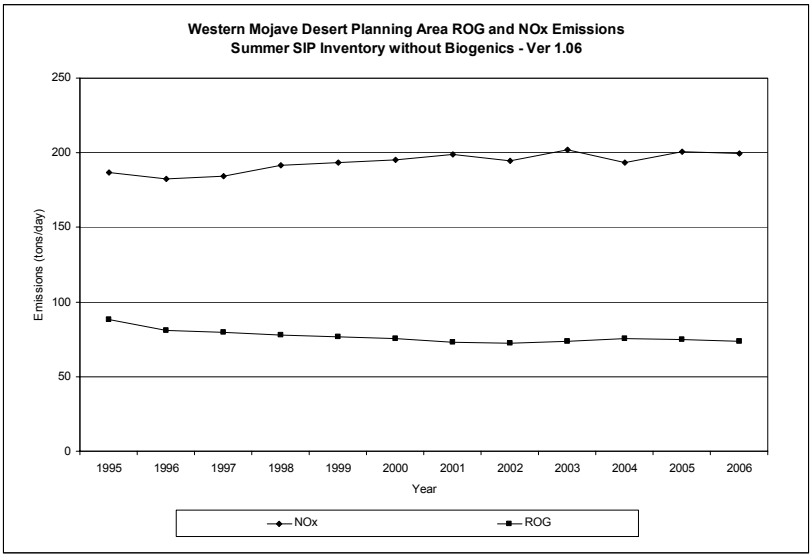
Emissions Trends

In 2006, ROG emissions in the Western Mojave Desert were dominated by off-road recreational vehicles, light duty passenger vehicles, heavy duty diesel trucks, and petroleum marketing. The main contributors of NOx emissions were heavy duty diesel trucks, mineral processing, trains, and off-road equipment. Statewide and local emissions control measures have significantly reduced the amounts of both ROG and NOx emitted by various sources throughout California. However, these reductions have not resulted in the same rate of decline in emissions in all areas. Furthermore, emissions in the Western Mojave Desert continue to be overshadowed by emissions from the South Coast and San Joaquin Valley. Figure 10 shows the estimated trend in the Western Mojave Desert ozone precursor emissions from 1995 to 2006. The totals reflect estimates for the summer season in tons per day and do not include emissions from natural biogenic sources.

ROG emissions show a small decline over the entire period. In contrast, there has been a fairly consistent increase in NOx emissions. The overall decrease in ROG emissions is about 15 percent from 1995 to 2006, compared with a 5 percent overall increase in NOx emissions during the same time period. Despite these changes, the levels of emissions in the Western Mojave Desert are less than levels in the upwind areas. For comparison, 2005 ROG and NOx emissions in the South Coast were about 10 and

5 times the level, respectively, of those in the Western Mojave Desert, while ROG and NOx emissions in the San Joaquin Valley were both about 5 times the level of those in the Desert. As emissions in these upwind areas are reduced, ozone air quality in the downwind Western Mojave Desert should also improve.

Figure 10: Western Mojave Desert Estimated ROG and NOx Emissions 1995 to 2006



Photochemical Modeling Results

The U.S. EPA (2005) provided criteria for calculating future year 8-hour ozone design values using air quality simulation results. Among these criteria were recommendations for air quality model performance, observed and simulated ozone concentration thresholds, and the number of simulated days used to calculate the relative response factor (RRF) used to scale reference year design values for future years. To meet these criteria, the South Coast District staff evaluated the results from the simulation of six high ozone episode periods occurring during the years 2004 and 2005.

Of the six episodes, the simulation results for the July 15 through 19, 2005 and the August 3 through 9, 2005 episode periods showed high concentrations and acceptable air quality model performance for ozone monitoring sites in the Western Mojave Desert and Antelope Valley planning areas. Therefore, subsequent analysis focused on these two periods. To evaluate future year ozone design values, the South Coast District staff simulated these episodes using emissions inventories developed for the years 2002 (the reference year for design values), 2005 (to evaluate ozone model performance), 2012, 2017 (for an attainment year of 2018), and 2020 (for an attainment year of 2021). Emissions totals were based on projections from the South Coast District's 2007 Air Quality Management Plan.

Based on the results, Phelan and Hesperia have the highest design values in 2017, but do not meet the federal 8-hour standard by then. Therefore, a 2018 attainment date, similar to that for the Coachella Valley Planning Area, is not appropriate. However, modeling predicted a design value at Phelan of 0.080 ppm by the end of 2020, which does show attainment and is consistent with a June 15, 2021 attainment deadline. The Joshua Tree site shows a 2020 design value of 0.060 ppm, while Twentynine Palms, the highest site in 2020, shows a design value of 0.082 ppm. These sites, as well as all others in the Western Mojave Desert and Antelope Valley planning areas, therefore show attainment by the end of 2020, as required for a Severe-17 nonattainment area and are consistent with a June 15, 2021 attainment deadline.

Summary

The Weight of Evidence package comprises a set of analyses that provide support for the attainment demonstration. Currently, the Western Mojave Desert is classified as Moderate with respect to the federal 8-hour ozone standard, with attainment required by 2010. Because of the transport impact of emissions and pollutants from the South Coast and San Joaquin Valley and the expected timing of emissions reductions in these upwind areas, the Mojave Desert Air Quality Management District has requested reclassification of the Western Mojave Desert Planning Area as Severe-17, with an attainment date of June 15, 2021. Based on the air quality and emissions analyses completed for the WOE assessment, attainment in the Western Mojave Desert can be projected by 2021, based on the following factors:

- Since 1995, there has been a 35 percent decrease in exceedance days, 20 and 25 percent decreases in maximum concentration and design value, and a 15 percent decrease in the mean Top 30 value. Although progress has slowed over the last five to six years, the ozone indicators, taken together, continue to show some improvement, albeit at a slower rate. Because of the continued improvement, the design value for Western Mojave Desert is now about 20 percent above the level of the standard, compared with a design value nearly 60 percent above the standard in 1995.

- Transport and air quality analyses support a link between the South Coast and Western Mojave Desert, as well as the San Joaquin Valley and Western Mojave Desert, with respect to ozone air quality. ROG and NOx emissions in the upwind areas are 5 to 10 times the level of those in the Western Mojave Desert. Furthermore, the transport impact from the upwind areas is overwhelming on some days. Modeling analyses show that attainment in the Western Mojave Desert will be dependent on emissions reductions in the upwind areas.

- The South Coast, San Joaquin Valley, and statewide emissions control strategies are expected to result in massive emissions reductions over the next 15 years, with both upwind areas expecting attainment by 2024. These emissions reductions will help facilitate attainment in downwind areas such as the Western Mojave Desert. Because ozone levels in the Western Mojave Desert are not as high as levels in the South Coast or the San Joaquin Valley, the emissions reductions needed for attainment in the Western Mojave Desert are not as high. Therefore, attainment is expected earlier than 2024.

- Although there is a great deal of uncertainty in the regression analyses completed for the Western Mojave Desert, they do suggest that the Western Mojave Desert will reach attainment before either the South Coast or San Joaquin Valley air basins.

- Photochemical modeling shows the Western Mojave Desert will not attain by 2010, or even by 2018. However, results show the area will attain by the end of 2020, with all sites having a design value of 0.082 ppm or less.

Taken together, the results from all of these analyses indicate the Western Mojave Desert Planning Area will not attain the federal 8-hour ozone standard by 2010, the area's a current deadline as a Moderate ozone nonattainment area. However, given the recent trends, the transport impact from the South Coast and San Joaquin Valley, and the expected level and timing of emissions reductions in these upwind areas, the Western Mojave Desert can expect to reach attainment by the end of 2020, consistent with the June 15, 2021 attainment deadline for Severe-17 nonattainment areas.