OZONE MAINTENANCE PLAN
FOR THE SUNLAND PARK, NEW MEXICO
NONATTAINMENT AREA

AIR QUALITY BUREAU
NEW MEXICO ENVIRONMENT DEPARTMENT
2044 GALISTEO
SANTA FE, NEW MEXICO 87505

EXECUTIVE SUMMARY

Due to the revocation of the 1-hour National Ambient Air Quality Standard (NAAQS) for ozone, the US Environmental Protection Agency (EPA) required that all areas that were currently nonattainment for the 1-hour NAAQS, but in attainment for the new 8-hour NAAQS for ozone conduct an analysis to redesignate those nonattainment areas to attainment/maintenance status..

Sunland Park has been designated nonattainment since 1995 for violations of the 1-hour NAAQS for ozone. Ozone is a criteria pollutant regulated under the Clean Air Act (CAA). The Sunland Park nonattainment area is approximately 42 square miles (sq. mi.) in area and includes the communities of Sunland Park, Santa Teresa, and La Union. Sunland Park, La Union and Santa Teresa are located along the border region of New Mexico and are adjacent to El Paso, Texas, and Ciudad Juarez, Mexico, or what is commonly referred to as the Paso del Norte Airshed. Air quality within the Paso del Norte Airshed has improved over the last 10 years due to cooperative efforts between the State of Texas, the State of New Mexico, and Mexico through organizations such as the Paso Del Norte Joint Advisory Committee.

EPA considers an area to be in attainment for the 1-hour ozone NAAQS if the level of 0.12 parts per million (ppm) for a 1-hour exposure not to be exceeded more than once per year, averaged over 3 years. Between the years of 2000 and 2002 there was one monitored level over the 1-hour NAAQS, and no monitored exceedances of the 8-hour ozone NAAQS.

ACRONYMS

AIRS – aerometric information retrieval system
AQB – New Mexico Environment Department Air Quality Bureau
BTU – British Thermal Units
CAA - Clean Air Act
CFR - Code of Federal Regulations
CNG – compressed natural gas
EIIP - emissions inventory improvement program
EPA - U. S. Environmental Protection Agency
FR - Federal Register
GCCS – gas collections and control system
HAP – hazardous air pollutant
HDDV - heavy duty diesel powered vehicles
HDGV - heavy duty gasoline powered vehicles
HFE – high float emulsions
HHDDT - heavy heavy-duty diesel trucks
LPG – liquid petroleum gas
LDDV - light duty diesel powered vehicles, from 0-6000 lbs gross vehicle weight
LDDT - light duty diesel powered trucks
LDGV - light duty gasoline powered vehicles
LDGT1 - light duty gasoline powered trucks, from 0-6000 lbs gross vehicle weight
LDGT2 - light duty gasoline powered trucks, from 6001-8500 lbs gross vehicle weight
MC - motorcycles
MPO – Metropolitan Planning Organization
NAAQS – national ambient air quality standards
NEI – National Emissions Inventories for the US
NMED – New Mexico Environment Department
NMIM - National Mobile Inventory Model
NMOC – non-methane organic compound
NSR - new source review
NOx - nitrogen oxides
O_3 - Ozone
PPM - parts per million
PPD – pounds per day
PSTB – New Mexico Environment Department Petroleum Storage Tank Bureau
SIP - State Implementation Plan
TCEQ – Texas Commission on Environmental Quality
TEMPO – temporal database for New Mexico Environment Department information retrieval system
TPD - tons per day
TPY – tons per year
VMT - vehicle miles traveled
VOC - volatile organic compounds

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INTRODUCTION

Introduction

The Sunland Park Ozone (O_3) Nonattainment area is approximately 42 square miles (sq. mi.) in area (see Map 1). The northern portion extends from the north boundary at latitude 32° 00' south to about latitude 31° 49'. This area is roughly 3.5 miles (mi) wide by 6.25 mi. high for a total of 21.9 sq. mi. The southern portion extends from 31° 49' south to the Mexico border and is about 8 mi. wide by 2.5 mi. high for a total of 20.0 sq. mi. This 42 sq. mi. area represents only 1.10% of the countywide area (3804 sq. mi.). The nonattainment area includes the communities, from south to north, of Sunland Park, Santa Teresa, and La Union. The area is largely rural with a small population and predominately agricultural land use along the Rio Grande, especially north of Santa Teresa.

The Sunland Park O_3 Nonattainment area lies within Doña Ana County, New Mexico. Doña Ana County has a total area of 3,804 sq. mi. and a population of 180,077 (estimate 2002). Much of this population is located within the city of Las Cruces, which is outside the nonattainment area.

Monitoring for several air pollutants, especially particulates and sulfur dioxide, has been conducted in the Sunland Park area since the mid 1970's. Some monitoring for ozone was conducted in La Union in the mid to late 1970's. Continuous monitoring for ozone has been conducted in La Union since 1984. Monitoring for O_3 in Sunland Park did not begin until 1992. The first recorded exceedance of the 1-hour O_3 National Ambient Air Quality Standard (NAAQS) occurred on September 18, 1992 in Sunland Park.

Sunland Park was officially designated as nonattainment for ozone in a Federal Register announcement published June 12, 1995 (60 FR 30789). See Appendix A for the full text of the Federal Register notice. Sunland Park was designated as a marginal nonattainment area, which is the lowest or least "serious" classification. When the base year inventory was conducted for Sunland Park a total of 12 exceedances of the federal ozone NAAQS (0.12 ppm for a 1-hour exposure not to be exceeded more than once per year, averaged over 3 years) had been documented. Ten of the 12 exceedances (83%) occurred during the months of August, September, and October. The three highest values occurred in August and September. Since 1997, there has been a stabilizing trend in Sunland Park. Between the years of 2000 and 2002 there was one monitored level over the 1-hour NAAQS. There were seven monitor levels over the 8-hour O_3 NAAQS between 2000-2002, but none caused an exceedance of the NAAQS (see Appendix B for monitoring data).

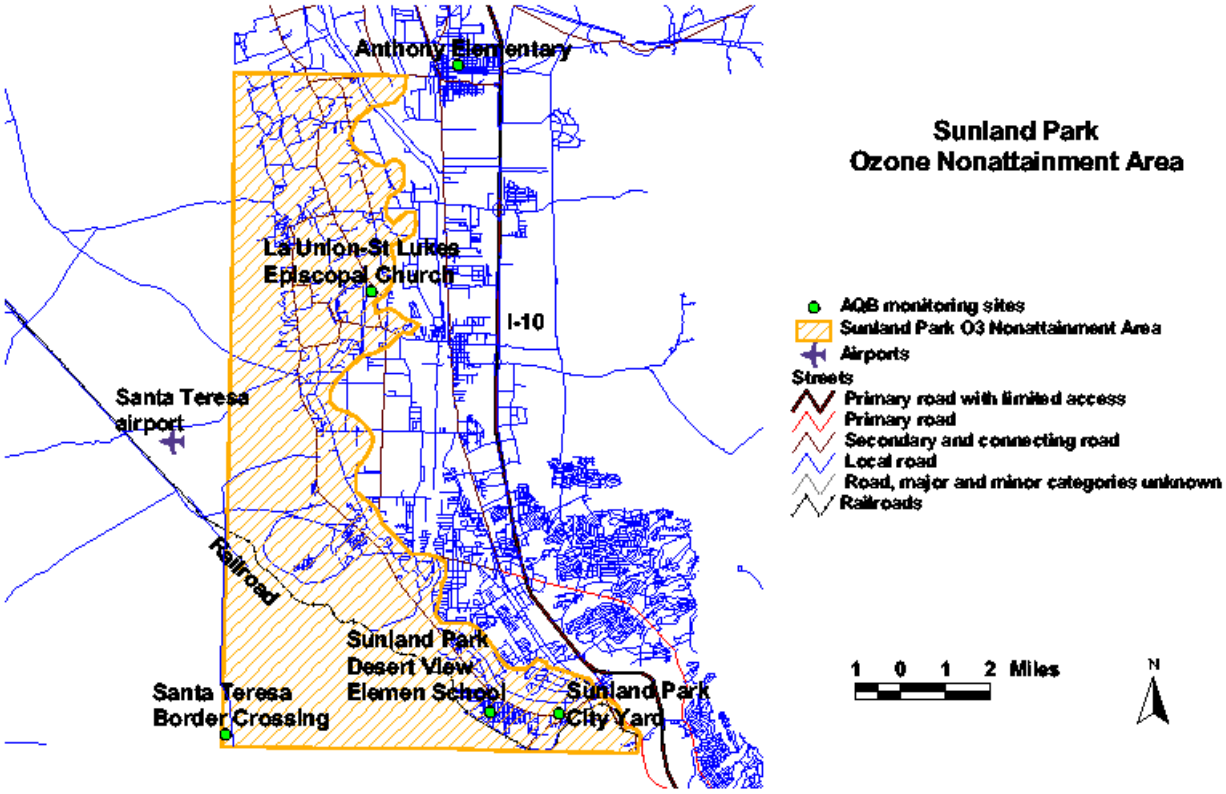
A State Implementation Plan (SIP) for the Sunland Park O_3 Nonattainment area was submitted to the U.S. Environmental Protection Agency (EPA) in 1997. The SIP for Sunland Park included a request for an oxide of nitrogen (NOx) waiver. The requirements for NOx waiver are found under Section 182(f) of the Clear Air Act (CAA) and provide that if it is determined by EPA that the overall net air quality benefits for an O_3 nonattainment area will be achieved without the

reduction of NOx emissions a waiver can be issued. Appendix C includes the SIP for Sunland Park and the NO_x waiver request. The Sunland Park SIP and the NO_x waiver were both approved by the EPA on February 8, 2002 (67 FR 6147). See Appendix D for the full text of the Federal Register notice.

Population

The Sunland Park nonattainment area is included within the El Paso Metropolitan Planning Organization (MPO). For population and employment determinations the MPO divided the area into four segments: 1) Sunland Park, 2) Santa Teresa, 3) La Union, and 4) Gadsden (the area north of La Union). Combined population for the nonattainment for the 2002 (estimated) was 16,269, respectively. This small area represents only 9.03% of the total county population (180,077).

Map 1-1. Sunland Park 1-Hour Ozone Nonattainment Area



Las Cruces, the largest city in the county, is located approximately 35 miles away from the Sunland Park nonattainment area and has never recorded an exceedance of the ozone standard. The close proximity (less than 10 mi.) of the Sunland Park nonattainment area to the much larger cities of El Paso, Texas (2002 estimated population of 577,189 people,) and Juarez, Mexico (estimated at over 1.2 million people in 2000), is suspected to be the primary cause for Sunland Park's violations of the federal 1-hour O_3 NAAQS.

MAINTENANCE PLAN

Maintenance Plan

Section 107(d)(3)(E) of the CAA mandates that for a nonattainment area to be reclassified to attainment, EPA must fully approve a maintenance plan for the area that meets the requirements of section 110. A maintenance plan is a SIP revision under CAA section 110 must provide for maintenance of the 8-hour O_3 NAAQS at least ten years after the EPA redesignates the area to attainment. The maintenance demonstration is satisfied if the state demonstrates that future emission inventories are consistently less than the attainment or baseline emission inventory. The effective date for designation for the Sunland Park Nonattainment area is June 15, 2004. The baseline inventory year for this plan is 2002 (Table 2-1), with a maintenance demonstration through 2014 (Table 2-3).

The Required Components of a Maintenance Plan

- Attainment Inventory
- Maintenance Demonstration
- Monitoring Network
- Verification of Continued Attainment
- Contingency Plan

Attainment Inventory

The CAA requires that an emissions inventory be developed to identify the level of emissions in the nonattainment area that is sufficient to attain the NAAQS. For the Sunland Park Nonattainment area the attainment inventory uses a base year of 2002. The following table (Table 2-1) lists all actual emissions (area, point, mobile, and biogenic) for the base year of 2002 for the O_3 precursors nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC). Appendix E contains the most recent inventory conducted for the point source facilities. A complete attainment inventory for the Sunland Park Nonattainment area can be found in Section III of this report.

Table 2-1. Summary of all source categories for 2002. TPY= tons per year. TPD = tons per day

Source Category	NOx		CO		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Area	30.40	0.0896	157.94	0.586	193.73	0.553
Point	1,085.7	3.044	192.38	0.552	94.19	0.331
Mobile	829.63	2.27	6,040.64	16.55	530.14	1.45
Biogenic	5.74	0.015	n/a	n/a	528.08	1.44
TOTAL EMISSIONS	1,951.47	5.41	6,390.96	17.68	1,342.04	3.74

Maintenance Demonstration

To demonstrate maintenance of the NAAQS for a nonattainment area it is required by the CAA to either show that future emissions of a pollutant or its precursor will not exceed the attainment inventory developed for the area or provide modeling to show that future sources and emissions will not cause an exceedance of the NAAQS.

Sunland Park, La Union and Santa Teresa are located along the border region of New Mexico and are adjacent to El Paso, Texas, and Ciudad Juarez, Mexico, or what is commonly referred to as the Paso del Norte Airshed. Air quality within the Paso del Norte Airshed has improved over the last 10 years due to cooperative efforts between the State of Texas, the State of New Mexico, and Mexico through organizations such as the Paso Del Norte Joint Advisory Committee. Although air quality has improved within this region, the area is still growing with a combined population of over 1.7 million people and increasing industrial sources along both sides of border. The Sunland Park Nonattainment area makes up less than .1% of the total population within the Paso del Norte Airshed, with total VOC, CO and NOx emissions that are 1.6 % of those in El Paso and Ciudad Juarez combined. Table 2-2 shows the contributions from El Paso County and Ciudad Juarez in comparison to the Sunland Park Nonattainment area.

Table 2-2. Emissions in Paso del Norte Airshed. TPY = tons/year

Source	*Ciudad Juarez TPY			**El Paso County TPY			Sunland Park TPY		
	VOC	NOx	CO	VOC	NOx	CO	VOC	NOx	CO
Mobile	20,208	25,590	155,583	9,939	17,122	148,277	530	830	6,040
Area	68,085	14,082	52,393	8,640	872	5,993	190	30	158
Point	2,308	18,133	13,821	861	4223	1,704	94	1,086	94
Total	90,601	57,805	221,797	19,440	22,217	155,974	810	1,946	6,292
Percentage	81.7	70.5	57.7	17.5	27.1	40.6	.73	2.4	1.6

* The emissions data for Ciudad Juarez comes from, *The 1999 Mexico NEI: Six Border States* and are based on the inventory data for the State of Chihuahua. This is the only complete emission inventory data currently available for this area.
** The emissions data for El Paso comes from the, *El Paso County 8-Hour Ozone Maintenance Plan* and the *El Paso Redesignation to Attainment for Carbon Monoxide and Maintenance Plan,* both submitted to EPA by the Texas Commission on Environmental Quality in January of 2006.

As shown above, Sunland Park contributes very little to the total air quality emissions within the Paso del Norte Airshed making it very difficult to demonstrate maintenance of the 8-hour ozone standard for 2014 using only the emissions from the Sunland Park Nonattainment area. Table 2-3 shows the emissions for the Sunland Park Nonattainment area in 2014, based on a projected population growth of 3.2% per year (University of New Mexico, Bureau of Business and Economic Research). Even with the increase of emissions based on population growth for the year 2014, the emissions in the Sunland Park Nonattainment area are still only 2.2% of the emissions in the Paso del Norte Airshed. In light of the limited amount of pollutants generated within the Sunland Park Nonattainment area, New Mexico finds it impossible to base the demonstration of maintenance for the area on the limited emissions emitted within the Sunland Park Nonattainment area.

Table 2-3. Summary of all source categories for 2014. TPY= tons per year. TPD = tons per day

Source Category	NOx		CO		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Area	42.07	0.115	218.59	0.598	262.44	0.719
Point	1,502.6	4.12	266.25	0.729	130.36	0.357
Mobile	1,147.96	3.14	8,360.24	22.90	733.71	2.010
Biogenic	7.94	0.015	n/a	n/a	730.86	2.002
TOTAL EMISSIONS	2,700.57	7.39	8,445.08	24.27	1,857.37	5.088

As an alternative, New Mexico will demonstrate the continued maintenance of the 8-hour O_3 NAAQS in the Sunland Park Nonattainment area through the use of cooperative efforts with the State of Texas and Mexico and current permitting requirements for point sources within the nonattainment area.

Cooperative Efforts within the Paso del Norte Airshed

The Joint Advisory Committee for the Improvement of Air Quality in the Ciudad Juárez, Chihuahua, El Paso, Texas, and Doña Ana County, New Mexico Air Basin (JAC) was established in 1996 to provide the local community with the means to participate as partners in the improvement of air quality in the Paso del Norte region. The JAC is a binational committee made up of private citizens, private sector representatives, university officials, federal, state, and local government officials, and non-governmental environmental and public health organizations. The JAC is charged with the development and recommendation of air quality improvement projects and programs to the Air Work Group established under the 1983 U.S.-Mexico La Paz Agreement. The JAC serves as the local community-based organization overseeing the process to achieve cleaner air for the Paso del Norte region. New Mexico has been an active participant in the JAC and has worked with the committee to assist in decreasing emissions of ozone precursors within the Paso del Norte Airshed.

Permitting Requirements

There are currently two major sources of air pollution, El Paso Electric – Rio Grande Generating Station and FOAM –EX, Santa Teresa Plant, in the Sunland Park O_3 Nonattainment area. Both of these facilities have Title V permits with the State of New Mexico (see Appendix F). The purpose behind Title V permits is to reduce violations of air pollution laws and improve enforcement of air quality control laws. This is accomplished through enforceable emission limitations and standards; a compliance schedule; a requirement that the permittee submit to the permitting authority, no less often than every 6 months, the results of any required monitoring; and such other conditions as are necessary to assure compliance with applicable requirements of their permit. Permit conditions for the El Paso Electric and FOAMEX, along with state regulations will ensure that future sources and emissions of VOC and CO will not cause an exceedance of the NAAQS (see appendix G for current state regulations pertaining to VOC and

CO emissions and permit conditions). The Sunland Park O_3 Nonattainment area currently has a NOx waiver, see Appendix D for that waiver.

Monitoring Network

To verify compliance with the NAAQS for O_3 once an area has been redesignated to attainment/maintenance, an appropriate air quality monitoring network needs to be maintained by the state. The monitoring network needs to be in accordance with 40 CFR 58.

The AQB will continue to use the current O_3 monitoring network already established in the Sunland Park Nonattainment area to verify attainment of the NAAQS in the area. This monitoring network is in accordance with 40 CFR 58. Table 2-4, below, contains information on the current O_3 monitoring network in the Sunland Park Nonattainment area.

Table 2-4. Monitoring Stations in the Sunland Park Nonattainment Area.

Name	AIRS Monitor ID	County Site ID	Monitoring Period
Sunland Park, NM	35-013-0017	0071	1989-Present
Desert View, NM	35-013-0021	0021	1996-Present
Santa Teresa, NM	35-013-0022	0022	1996-Present
La Union, NM	35-013-0008	0008	1974-Present

Verification of Continued Attainment

To guarantee that attainment will be continued in the future, the state needs to ensure that they have the legal authority to implement and enforce all air quality measures needed to attain and maintain the 8-hour NAAQS for O_3. The current permit conditions for El Paso Electric and FOAM-EX and state regulations NMAC 20.2.70 – *Operating Permits* and NMAC 20.2.72 – *Construction Permits* verify that the New Mexico has the continued legal authority needed to implement and enforce air quality controls to maintain the NAAQS for O_3 in Sunland Park in the future. New Mexico will also provide the Environmental Protection Agency with an interim emissions inventory report for point, area, mobile and biogenic emissions of VOCs and CO in the Sunland Park Maintenance area.

Contingency Plan

As a requirement of section 175A of the CAA, a contingency plan must be developed to correct any violations of the O_3 NAAQS in Sunland Park, Santa Teresa, and La Union after the area has been redesignated. The plan should be an enforceable part of the SIP and should ensure that the appropriate measures will be adopted in the event that the NAAQS are exceeded for O_3.

New Mexico has very little to no control over a majority of the O_3 precursor emissions in the Paso del Norte Airshed, thus making it difficult to provide contingency measures for any future violations of the O_3 NAAQS in the Sunland Park area. Although New Mexico does have little control over the emissions with the airshed, education and outreach can be developed as a means of protecting public health if there are any future violations of the O_3 NAAQS. New Mexico has

developed a similar public awareness program for dust storms caused by high wind events under the Doña Ana County Natural Events Action Plan.

A public awareness program developed for O_3 in the Sunland Park Maintenance area in the event there is a violation of the 8-hour O_3 NAAQS would include the use of public outreach materials and health advisories to educate the public on the health risks associated with prolonged exposure to O_3. The program would utilize the following tools:

- Outreach materials such as brochures and pamphlets specific to air quality in the Sunland Park Maintenance area;
- Open houses to be held at the beginning of the O_3 season and mid-way through; and
- Ozone Action Days.

Outreach Materials

The outreach materials will include an informational and health-related brochure titled "Ozone and Health" will be published in English and Spanish. This brochure would be distributed primarily during the ozone season in Sunland Park, but will be available at the City Planning office in Sunland Park year around. Other outreach material will include public service announcements, press releases, and informational pamphlets. Examples of similar outreach materials developed by NMED are included in Appendix H.

Bi-annual Open Houses

The NMED will hold open houses in partnership with the New Mexico Department of Health, Border Health Office (DOH). The open houses will be designed to provide information and give the public the opportunity to speak to the NMED and/or the DOH one on one. The open houses would be held in May and August in Sunland Park.

Ozone Action Days

Ozone Action Days will be announced during weather forecasts on the radio and television. An Ozone Action Day will be called when the State weather forecasters predict that weather conditions will be conducive for the formation of ozone. Advisories will also be placed on the NMED/AQB web site. Real time monitoring data is also available on the NMED/AQB web site. Information on Ozone Action Days will be included in the outreach material for the Maintenance area.

If a violation of the 8-hour O_3 standard is recorded in the Sunland Park Maintenance area, New Mexico will implement the contingency measures listed above as expeditiously as practicable, but no later than 24 months after the violation.

EMISSION INVENTORY FOR SUNLAND PARK NEW MEXICO

Introduction

The emissions inventory process includes quality assurance procedures as a means to verify that data have been reviewed and examined for their source or origin, methods of compilation, accuracy, occurrence of errors, and clarity. This is to assure a good product and that such procedures can easily be applied to future inventories. EPA's *Emission Inventory Improvement Program* was used as a guide in developing the 2002 emission inventory for the Sunland Park Nonattainment area.

The New Mexico Environment Department Air Quality Bureau (AQB) staff assisted in planning the initial field survey and data collection process. Point sources were identified through EPA AIRS data and AQB TEMPO database. Identifying area sources began by obtaining phone book listings and business listings for the area. A questionnaire was designed by staff based on the questionnaire used for the 1997 SIP submittal. The questionnaire was designed to be taken into the field and to be filled out during actual site visits. Since this area was relatively small, both in size and population, such site visits were planned as the best way to determine actual source emissions. An informational flyer was assembled and mailed out to all identified businesses within the nonattainment area prior to the actual site visits. A copy of the field survey questionnaire can be found within the Appendix I. Although the area is relatively small, six (6) staff members participated in the field survey by dividing the nonattainment area into three (3) sections with two (2) staff members assigned to each section. The area was thoroughly scouted for all possible sources of air pollution. Considerable time was spent in direct site visits.

All data collected were turned into the lead staff person who then began to evaluate, organize and assemble collected information into various source categories according to EPA guidance. Most emission estimation procedures follow those within AP-42. Other guidance documents used are listed as references to this report. As much as possible, all calculations are described within the various sections of this report. Calculations have been checked by other staff members. It should be emphasized that in many cases, especially for area sources, emissions are rough estimates. This is because the data on which they are based are often rough estimates of materials usage. Many AP-42 emission factors are themselves inexact approximations. In any case, data and calculations have been validated and quality-assured for correctness. An emission sources matrix is available in Appendix J. The matrix includes the source name/category, the methodology used, the activity data used, and any relevant comments.

Area Source Emissions

The sources within the nonattainment area were surveyed as well as the sources within 1 mile of the nonattainment area, which includes the Santa Teresa Industrial Park and the Dona Ana County Airport. Area source emissions have been divided into two groups: 1) combustion sources and 2) evaporative sources. Combustion sources include industrial, commercial and residential use of natural gas, oil, LPG, and coal. Open burning such as in agriculture, forestry,

and trash burning also fall into this category. Evaporative emissions include many different sources such as solvent use, coating and painting operations, dry cleaning, and pesticide use.

INDUSTRIAL COMBUSTION SOURCES

A. Brick Manufacturer:

From survey information this facility operates a natural gas kiln that consumes 4176 x 10^6 BTU/month. This facility operates throughout the year; so multiplying 4176 by 12 months yields 50.1 x 10^9 BTU/year consumed. Converting this to cubic feet of gas (1050 BTU/ft^3) yields 4.773 x 10^7 ft^3. Emission factors from AP-42 are (small industrial boiler assumed):

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.31	(5.5 x 0.42 to factor out methane)

Annual and daily (ozone season) emissions are:

	Annual (tons)	Daily (tons)
CO:	2.0	0.00547
NOx:	2.38 (2.86 with rule effectiveness)	0.00783
VOC:	0.055	0.000151

For ozone season day calculations this facility reported operating 7 days/week and 24 hrs/day so the seasonal activity was divided as 25% winter, 25% spring, 25% summer, and 25% fall.

CO=(47.73 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 Ton/2000Lbs)
NOx=(47.73x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1Ton/2000 Lbs)(.2)
VOC=(47.73 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 Ton/2000Lbs)

B. The Food Processing Company:

From survey information this facility operates a natural gas boiler that consumes 8864 x 10^6 BTU/month. This facility operates throughout the year, so multiplying 8864 by 12 months yields 1.1 x 10^{11} BTU/year consumed. Converting this to cubic feet of gas (1050 BTU/ft^3) yields 10.13 x 10^7 ft^3. Emission factors from AP-42 are (small industrial boiler assumed):

Emission Factor (lbs/10^6 ft^3)		
CO:	84	
NOx:	100	
VOC:	2.31	(5.5 x 0.42 to factor out methane)

Annual and daily (ozone season) emissions are:

	Annual (tons)	Daily (tons)
CO:	4.25	0.016

NOx:	5.065(6.078 with rule effectiveness)	0.023
VOC:	0.11	0.00045

Ozone season day calculations were based on 5 days/week, 16-hrs/day operation and 25% of their activity in the fall season (25% for each season).

CO=(101.3 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 Ton/2000Lbs)
NOx=(101.3x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1Ton/2000 Lbs)(.2)
VOC=(101.3 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 Ton/2000Lbs)

C. The Supplier of Sterilized Medical Equipment:
This facility reported having 2 gas-fired boilers each rated at 1.5 x 10^6 BTU/hr; 1gas-fired boiler rated 3,500,000 BTU/hr; and another gas-fired boiler rated at 4,500,000 BTU/hr. They reported consuming 45,240 ft^3/month. From the survey information these four natural gas boiler consume 7920 x 10^6 BTU/month. Multiplying by 12 yields a yearly figure of 9.5 x 10^{10} BTU/year. Converting to cubic feet (1050 BTU/ft^3) results in 90.51 x 10^6 ft^3 consumed per year. Emission factors for commercial size boilers from AP-42 are:

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.36	(5.5 x 0.43 to factor out methane)

Calculated annual and daily emissions are:

	Annual (tons)	Daily (tons)
CO:	3.80	0.01041
NOX:	4.52 (5.42 with rule effectiveness)	0.01486
VOC:	0.106	0.000292

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

This facility is also permitted for ethylene oxide and propylene oxide emissions from the sterilization and aeration chambers. The facility has permitted allowables of 3.92 tons/yr and actually emissions of 3.82 tons/yr for 2002.

	Annual (tons)	Daily (tons)
Total VOC:	3.926	.010756

CO=(90.51 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(90.51x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)(.2)
VOC=[(90.51 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)]+3.83 tons/yr

D. Telecommunication Equipment:
This facility reported having 1gas-fired boiler rated at 6 x 10^6 BTU/hr. They reported consuming 1,500 ft^3/month. From the survey information this natural gas boiler consume 4320 x 10^6 BTU/month. Multiplying by 12 yields a yearly figure of 5.1x 10^{10} BTU/year. Converting to cubic feet (1050 BTU/ft^3) results in 49 x 10^6 ft^3 consumed per year. Emission factors for commercial size boilers from AP-42 are:

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.36	(5.5 x 0.43 to factor out methane)

Calculated annual and daily emissions are:

	Annual (tons)	Daily (tons)
CO:	2.0	0.00549
NOX:	2.45(2.94 with rule effectiveness)	0.00673
VOC:	0.056	0.00015

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

CO=(49 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(49x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)(.2)
VOC=(49 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)

E. Copper Conductor Manufacturer:
This facility reported having 1gas-fired boiler rated at 1.34 x 10^6 BTU/hr. From the survey information this natural gas boiler consume 964 x 10^6 BTU/month. Multiplying by 12 yields a yearly figure of 1.15x 10^{10} BTU/year. Converting to cubic feet (1050 BTU/ft^3) results in 10.9 x 10^6 ft^3 consumed per year. Emission factors for commercial size boilers from AP-42 are:

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.36	(5.5 x 0.43 to factor out methane)

Calculated annual and daily emissions are:

	Annual (tons)	Daily (tons)
CO:	.45	0.00125
NOX:	.545 (.654 with rule effectiveness)	0.00179
VOC:	0.013	0.000035

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

CO=(10.9 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(10.9x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)(.2)
VOC=(10.9 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)

F. Manufacturer of Automotive Fabrics:
This facility reported having 1gas-fired boiler rated at 52 therms/day. Converting terms to cubic feet (98.1 ft^3/therms) results in 5101.2 ft^3/day. From the survey information this natural gas boiler consume 153,036 ft^3/month. Multiplying by 12 yields a yearly figure of 1.8x 10^6 ft^3/year. Emission factors for commercial size boilers from AP-42 are:

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.36	(5.5 x 0.43 to factor out methane)

Calculated annual and daily emissions are:

	Annual (tons)	Daily (tons)
CO:	.07	0.000192
NOX:	.09 (.108 with rule effectiveness)	0.000296
VOC:	0.002	0.0000057

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

CO=(1.8 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(1.8x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)(.2)
VOC=(1.8 x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)

G. Crematoriums:
There are two crematoriums located within the nonattainment area. One facility reported having 1gas-fired boiler rated at 2.0 x 10^6 BTU/hr. The other facility reported having 1-gas-fired boiler at 1.75 x 10^6 BTU/hr. From the surveyed information these two natural gas boilers consume 2520 x 10^6 BTU/month. Multiplying by 12 yields a yearly figure of 3.02x 10^{10} BTU/year. Converting to cubic feet (1050 BTU/ft^3) results in 28.8 x 10^6 ft^3 consumed per year. Emission factors for commercial size boilers from AP-42 are:

	Lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.36	(5.5 x 0.43 to factor out methane)

Calculated annual and daily emissions are:

	Annual (tons)	Daily (tons)
CO:	1.2	0.00329
NOX:	1.44(1.728 with rule effectiveness)	0.00474
VOC:	0.033	0.00009

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

CO=(28.8 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(28.8x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)(.2)
VOC=(28.8x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)

H. Landfill Gas Flare:
The landfill located in the nonattainment area installed a gas collection and control system (GCCS) in August of 2001. The landfill gas generated from the anaerobic decomposition of municipal solid waste is collected through a network of vertical extraction wells and routed through buried transmission piping to a utility flare for destruction. The emissions reported by the landfill for the utility flaring is as follows:

	Annual (tons)	Daily (tons)
CO:	7.24	0.01983
NOX:	1.33 (1.596 with rule effectiveness)	0.00437
VOC:	0.061	0.00016

Ozone season day calculations were based on 7 days/week operation and 25% of their activity in the fall season (25% winter, 25% spring, 25% summer).

SUMMARY OF INDUSTRIAL COMBUSTION SOURCES:
In the summary table below, rule effectiveness numbers for NOx have been used:

Table 3-1 Summary of industrial combustion sources. TPY = tons/year; TPD = tons/day

SOURCE	CO		NOx		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Brick manufacturer	2.0	0.00547	2.86	0.00783	0.055	0.000151
Food preparation facility	4.25	0.016	6.078	0.023	0.11	0.00045
Medical supply						

sterilization facility	3.80	0.01041	5.42	0.01486	3.926	0.010756
Telecommunication Equipment	2.0	.0055	2.94	.00807	.056	.000154
Copper Conductor Manufacturer	.45	.00123	.654	.00179	.013	.0000357
Automotive Fabric Manufacturer	.07	.000192	.108	.000296	.002	.0000054
Crematoriums	1.22	.00335	1.728	.00474	.033	.00009
Landfill Gas Flare	7.24	.01983	1.596	0.00437	0.061	0.00016
TOTALS	21.03	0.06198	21.384	0.06762	4.256	0.011802

COMMERCIAL COMBUSTION SOURCES

These sources include combustion of fuel-oil (distillate and/or residual), coal, natural gas, and LPG. Examples of sources in this category are small manufacturing operations, restaurants, retail, service, groceries, schools, and government buildings. Rule effectiveness was not applied here because emissions calculations are based on population figures and not individual facilities.

A. Commercial Natural Gas Use:

Commercial gas use was estimated from statistics on commercial gas usage in New Mexico and employment figures for Dona Ana County. Commercial natural gas use in New Mexico as reported by the Energy Information Administration was 26,057 x 10^6 ft^3 for 2002. Statewide employment for 2002 has been estimated at 827,600. Dona Ana County employment for 2002 has been estimated at 70,202. The 2002 estimated population of the nonattainment area is 16,269. Using a ratio to estimate employment in the nonattainment area yields the following:

$$\frac{70{,}202}{178{,}593} = \frac{X}{16{,}269}$$

X = 6395 people employed in the nonattainment area.

Five facilities that could be classified as commercial (a power generation plant, a brick manufacturer, an automobile foam seat manufacturer, a food preparation facility, and a facility that sterilizes medical supplies) were determined separately, elsewhere in this report, as either point sources or industrial combustion sources. Employment figures for these facilities will need to be subtracted from the 6395 figure. These facilities reported employment figures of 19, 39, 194, 432, 30, 125, 70, 8, 6, and 3 people respectively. So, 6395 - 926 = 5469. Using another ratio to apportion down the commercial gas usage to the nonattainment area:

$$\frac{26{,}057 \times 10^6\ ft^3}{} = \frac{X}{}$$

$X = 172.19 \times 10^6\ ft^3$

827,600 5469

The following are AP-42 emission factors for commercial gas use:

	lbs/10^6 ft^3	
CO:	84	
NOx:	100	
VOC:	2.31	(with methane factored out; 5.5 x 0.42 = 2.31)

Next, multiplying the natural gas consumed within the nonattainment area by these factors yields the following annual emissions converted to tons (using CO as an example to show the full calculation):

	Tons/year
CO:	7.23
NOX:	8.60
VOC:	0.198

CO=(172.19 x 10^6 ft^3)(84 Lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(172.19x10^6 ft^3)(100 Lbs/$10^6$$ft^3$)(1ton/2000 Lbs)
VOC=(172.19x 10^6 ft^3)(2.31 Lbs/10^6 ft^3)(1 ton/2000Lbs)

B. Commercial LPG Use:

Liquid petroleum gas (LPG) is most often propane or butane. Emissions from LPG combustion are determined in a similar procedure as for natural gas above. Total statewide use of LPG in 2001 was 15.9 x 10^{12} BTU. The Energy Information Association makes the assumption that the LPG sold for commercial use is 15%. The LPG consumption by the transportation sector has been factored out. Apportioning this down to the employed population size of the nonattainment area yields 1.25 x 10^{10} BTU. Since AP-42 emission factors are in lbs/1000 gal., BTUs were converted to gallons. Since it is not known how much propane vs. butane is used in the area, a 50/50 split was assumed, so a conversion factor of 96,750 BTU/gal was used (average of 91,500 BTU/gal for propane and 102,000 BTU/gal for butane). This results is 129,603 gal of LPG consumed in the nonattainment area for 2001. AP-42 emission factors were also figured as an average of propane and butane:

CO:	(2.1 + 1.9)/2 = 2.0 lbs/1000 gal
NOx:	(15 + 14)/2 = 14.5 lbs/1000 gal
VOC:	(0.6 + 0.5)/2 = 0.55 lbs/1000 gal

Annual emissions are then (using CO as an example):

	Tons/year
CO:	0.13 tons
NOx:	0.94 tons
VOC:	0.035 tons

CO=(129,603gal)(2 Lbs/1000gal)(1 ton/2000Lbs)

NOx=(129,603gal)(14.5 Lbs/1000gal)(1ton/2000 Lbs)
VOC=(129,603gal)(.55 Lbs/1000gal)(1 ton/2000Lbs)

C. Commercial Distillate Use:

Statewide use of distillate fuel was 72.3x 10^{12} BTU in 2001. The Energy Information Administration reports that commercial sales for distillate fuel accounts for 5.54% of the total sales for distillate fuel for the United States in 2001. This ratio was also used to determine the total commercial distillate use for New Mexico. The total commercial use of distillate oil for New Mexico is 4.0 x 10^{12}. Apportioning this down to the nonattainment area yields 2.64 x 10^{10} BTU. Distillate fuel at 140,000 BTU/gal. results in 189,063 gal. consumed in the nonattainment area for 2001. AP-42 emission factors are:

CO:	5 lbs/1000 gal
NOx:	20 lbs/1000 gal
VOC:	0.34 lbs/1000 gal

Annual emissions are then:

	Tons/year
CO:	0.47 tons
NOx:	1.89 tons
VOC:	0.032 tons

CO=(189,063gal)(5 Lbs/1000gal)(1 ton/2000Lbs)
NOx=(189,063gal)(20 Lbs/1000gal)(1ton/2000 Lbs)
VOC=(189,063gal)(.34 Lbs/1000gal)(1 ton/2000Lbs)

D. Commercial Coal Use:

The Annual Coal Report compiled by the Energy Information Administration reports that most to all of the coal used in New Mexico for 2002 was used for electric power generation. The Energy Information Administration reported that roughly 79 x 10^{3} tons of coal was used in New Mexico in 1999, which is the most recent year with information on coal consumption, for all sectors besides electric power generation. Nationally, the Energy Information Administration report that 4% of coal used is for commercial. It is the assumption of the AQB that New Mexico is the same. There was a 2.1 increase in the use of coal from 1998-1999. A 6.3% (2.1 x 3 years) increase was used to determine a 2002 projection. Proportioning this down to the size of the nonattainment area yields 22.19 tons. AP-42 emission factors are (assuming a worst case conservative estimate):

CO:	18 lbs/ton
NOx:	33 lbs/ton
VOC:	1.3 lbs/ton

Annual emissions are then:

CO:	0.199 tons
NOx:	0.366 tons

VOC: 0.014 tons
CO=(22.19 tons)(18 Lbs/tons)(1 ton/2000Lbs)
NOx=(22.19 tons)(33 Lbs/tons)(1 ton/2000 Lbs)
VOC=(22.19 tons)(1.3Lbs/tons)(1 ton/2000Lbs)

SUMMARY OF ALL COMMERCIAL COMBUSTION SOURCES:
Ozone season day calculations for all source categories are based on 6 days/week operation and 25% of activity in the fall (35% winter, 25% spring, and 15% summer).

Table 3-2. Summary of commercial combustion sources. TPY = tons/year; PPD = lbs/day

FUEL	CO		NOx		VOC	
	TPY	PPD	TPY	PPD	TPY	PPD
Natural gas	7.23	46.34	8.60	55.13	.198	1.27
LPG	0.13	.833	.94	6.03	.035	0.224
Distillate oil	0.47	3.01	1.89	11.92	.032	0.205
Coal	0.20	1.27	.366	2.35	.011	.071
TOTALS	8.029	51.45 (0.025 tons)	11.80	75.43 (0.0378 tons)	0.28	1.8 (0.00089 tons)

RESIDENTIAL COMBUSTION SOURCES
These include combustion of fuel-oil, coal, natural gas, LPG, and wood. Energy usage in residences was obtained from The Energy Information Administration:

ENERGY SOURCE	TRILLION BTU	PERCENT OF TOTAL
Coal	.01 $x10^{12}$	.02
Electricity	14 x 10^{12}	23.38
LPG	10.75 x 10^{12}	17.9
Natural gas	34.4 x 10^{12} (34,411 x 10^{6} ft^{3})	57.45

Distillate Oil	.7 $x10^{12}$	1.16
TOTALS	59.86	100

A. Residential LPG Use:

The Energy Information Association makes the assumption that the LPG sold for residential use is 85%. The LPG consumption by the transportation sector has been factored out. Assuming 17.9% of the households use LPG, then multiplying by the estimated number of households in the nonattainment area 4822 (estimation based on County wide increase in housing from 2000 to 2002) yields 863 households in the nonattainment area using LPG. The total LPG consumed for residences statewide is 10.75×10^{12} BTU. Once again, since it is not known how much propane vs. butane is used in the area, a 50/50 split was assumed, so a conversion factor of 96,750 BTU/gal was used (average of 91,500 BTU/gal for propane and 102,000 BTU/gal for butane). Using another ratio to apportion down the LPG usage to the nonattainment area:

$$\frac{11 \times 10^7 \text{ gal}}{805{,}294} = \frac{X}{4822} \qquad X = 654{,}634 \text{ gal}$$

Apportioning this down to the nonattainment area gives 654,634 gal consumed in the nonattainment area. AP-42 emission factors are:

CO: 1.32 lbs/1000 gal
NOx: 9.57 lbs/1000 gal
VOC: 0.363 lbs/1000 gal

Calculated emissions are then:

CO: 0.43 tons/yr
NOx: 3.13 tons/yr
VOC: 0.12 tons/yr

CO=(654,634 gal)(1.32 lbs/1000gal)(1 ton/2000Lbs)
NOx=(654,634 gal)(9.57 lbs/1000gal)(1 ton/2000 Lbs)
VOC=(654,634 gal)(.363 lbs/1000gal)(1 ton/2000Lbs)

B. Residential Natural Gas Use:

Assuming 57.45% of the residences use natural gas and multiplying by the number of residences (4822) results in 2770 residences. With $34{,}411 \times 10^6$ ft^3 of natural gas consumed statewide by residences and apportioning down for the nonattainment area yields 204×10^6 ft^3 consumed in the nonattainment area. AP-42 emission factors are:

CO: 40 lbs/10^6 ft^3

NOx: 94 lbs/10^6 ft^3
VOC: 8.7 lbs/10^6 ft^3

Calculated annual emissions are:

CO: 4.08 tons
NOx: 9.58 tons
VOC: 0.88 tons

CO=(204 x10^6 ft^3)(40 lbs/10^6 ft^3)(1 ton/2000Lbs)
NOx=(204 x10^6 ft^3)(94 lbs/10^6 ft^3)(1 ton/2000 Lbs)
VOC=(204 x10^6 ft^3)(8.7 lbs/10^6 ft^3)(1 ton/2000Lbs)

C. Residential Coal Use:
Assuming .02% of residences are using coal then multiplying by the number of residences (4822) yields 2 residences within the nonattainment area using coal. The Energy Information Administration reported that roughly 79 x 10^3 tons of coal was used in New Mexico in 1999, which is the most recent year with information on coal consumption, for all sectors besides electric power generation. Nationally, the Energy Information Administration reports that .6% of coal used is in residences. It is the assumption of the AQB that New Mexico is the same. There was a 2.1 increase in the use of coal from 1998-1999. A 6.3% (2.1 x 3 years) increase was used to determine a 2002 projection. Proportioning this down to the size of the nonattainment area yields 3 tons. AP-42 emission factors are:

CO: 11 lbs/ton
NOx: 22 lbs/ton
VOC: 1.3 lbs/ton

Calculated annual emissions are:

CO: 0.017 tons
NOx: 0.033 tons
VOC: 0.00195 tons

CO=(3 tons)(11 lbs/ton)(1 ton/2000Lbs)
NOx=(3 tons)(22 lbs/ton)(1 ton/2000 Lbs)
VOC=(3 ton)(1.3 lbs/ton)(1 ton/2000Lbs)

D. Residential Distillate Oil Use:
Statewide use of distillate fuel was 7.76 x10^{12} BTU in 2001. The Energy Information Administration reports that residential sales for distillate fuel accounts for 10.74% of the total sales for distillate fuel for the United States in 2001. This ratio was also used to determine the total residential distillate use for New Mexico. The total residential use of distillate oil for New Mexico is .7 x 10^{12}. Apportioning this down to the nonattainment area yields .42 x 10^{10} BTU. Distillate fuel at 140,000 BTU/gal. results in 29,939 gal. consumed in the nonattainment area for 2001. AP-42 emission factors are:

CO: 5 lbs/1000gal
NOx: 20lbs/1000gal
VOC: .713 lbs/1000gal

Calculated annual emissions are:

CO: .07 tons
NOx: .29 tons
VOC: 0.016 tons

CO=(29,939 gal)(5 lbs/1000gal)(1 ton/2000Lbs)
NOx=(29,939 gal)(20 lbs/1000gal)(1 ton/2000 Lbs)
VOC=(29,939 gal)(.713 lbs/1000gal)(1 ton/2000Lbs)

E. Residential Electricity Use:
These emissions are not calculated at this level, but rather at the point source level, since the combustion necessary to generate the electricity generally occurs at a large electrical generating facility.

SUMMARY OF RESIDENTIAL COMBUSTION SOURCES**:**
Ozone season day calculations are based on 7 days/week operation and 25% activity in the fall (42% winter, 25% spring, and 8% summer).

Table 3-3. Summary of residential combustion sources. TPY = tons/year; PPD = pounds/day.

SOURCE	CO		NOx		VOC	
	TPY	PPD	TPY	PPD	TPY	PPD
LPG	0.43	2.36	3.13	17.15	0.12	0.66
Natural gas	4.08	22.35	9.58	52.49	0.88	4.82
Coal	0.017	0.093	0.033	0.18	0.002	0.011
Distillate Oil	.07	.38	.29	1.6	0.016	0.088
TOTALS	4.6	25.18 (0.012 tons)	13.03	71.42 (0.036 tons)	1.02	5.59 (0.0028 tons)

OPEN BURNING SOURCES

This includes open burning of municipal (household) trash, structural fires, agricultural burning, orchard heaters, forest fires (wildfire, prescribed fire, or prescribed natural fire) and grass fires. Each of these will be summarized separately below.

A. Open Burning of Trash:

Dona Ana County has an ordinance stating that household waste must be placed in landfills and not burned. Both the cities of Las Cruces and Sunland Park implement their own programs, but the county codes enforcement officer still works the Santa Teresa and La Union areas of the current ozone nonattainment area. Violations of the ordinance do occur but county staff do not keep an accurate log, nor do they have sufficient staff to fully monitor open burning. Emissions from open burning of trash in violation of the ordinance can be calculated as follows:

Population of the nonattainment area:	16,269
Per capita waste generation (lbs/day):	3.1 (US EPA national average for solid waste generation)
Total waste generation (lbs/day):	50,434
Total waste generation (tons/year):	9,078

It is assumed by EPA that 72% municipal solid waste is collected and sent to landfills in compliance with the county ordinance. The remaining 28% is assumed to be burned at home. Also, approximately 75% of the available waste is assumed combustible.

Total waste available for combustion:	2542 tons
Percent of waste combustible:	75%
Waste actually combusted:	1906.4 tons

	AP-42 open burning emission factors (Lbs/ton)	Annual Emissions (Lbs/yr)	Annual Emissions (Tons/year)	Daily Emissions (Lbs/day)
CO	85	162,044	81.02	445.0
NOx	6	11,438	5.72	31.42
NMOC (VOC)	30	57,192	28.6	157.12

Daily emissions are based on 7 days/week and 25% of the activity in the ozone season (25% for each of the four seasons).

B. Structure Fires:

The Sunland Park fire department has indicated there were 88 fire incidences in 2002. This included both structural and grass fires, but numbers for each were unavailable. EPA's estimation method in the guidance documents uses a figure of 2.3 fires/1000 people. With an estimated nonattainment area population of 16,269, this yields 37.4 structural fires in 2002. It was estimate by the Sunland Park Fire Department that roughly 40-50 of the fires responded to were structure fires. To provide the most conservative emission estimates, the estimates provide

by the Sunland Park Fire Department will be used instead of EPA estimation method. Using 1.15 tons of material per fire times 45 fires yields 51.75 tons of combustible material per year.

	AP-42 emission factors	Annual Emissions		Daily emissions
	Lbs/1000 tons	Lbs	Tons	(Lbs/day)
CO:	60	3.105	0.00155	0.0085
NOx:	1.4	0.072	0.000036	0.0002
VOC:	11	0.569	0.00365	0.0016

Ozone season daily calculations are based on 7 days/week and 25% activity per season.

C. Grass Fires:

In Using the 88 fire incidences reported by the Sunland Park fire department and subtracting 45 structural fires (see B. above) yields an estimated 43 grass fires. Assuming an average size of one acre makes a total of 48 acres burned. AP-42 does not contain a fuel loading factor for grass, so wheat (being a species of grass) was used as a substitute. The wheat fuel loading factor is 1.9 tons/acre. Multiplying this by the 48 acres gives 81.7 tons of fuel consumed. Grass emission factors from AP-42 are:

CO:	101 lbs/ton
NMOC (VOC):	19 lbs/ton

Calculated annual and daily emissions are:

	Annual	Daily
CO:	4.12 tons (8251.7 lbs)	22.61 lbs.
NMOC (VOC):	0.776 tons (1552.3 lbs)	4.253 lbs.

Ozone season daily emissions are based on 7 days/week and 30% activity in the fall (25% winter, 30% spring, and 15% summer).

D. Orchard heaters:

No orchard heaters are used in the area, according to staff at the New Mexico State Agriculture Department/Dona Ana County Agricultural Co-op and Extension Service. Pecans, the most abundant orchard crop, do not need heaters and the few apple orchards in the area do not use heaters either.

F. Forest fires:

There are no forests to speak of in the nonattainment area to generate such a fire.

G. Agricultural burning:

According to staff at the New Mexico Environment Field Office in Dona Ana County there is very limited burning with the nonattainment area. Burning is not a standard practice for crops in the area. The principle burning that does take place involves trimmings from the pecan orchards and burning of weeds (especially tumbleweeds) in ditches. The NMED stated that burn permits

within the Sunland Park nonattainment area are issued through the Sunland Park Voluntary Fire Department.

According to Robert Monsivaiz, Chief of the Sunland Park Voluntary Fire Department, roughly around 12 burn permits were issued for locations within the nonattainment area. The actual permits were not available for review. Based on the percentages used in the 1995 Emission Inventory of the Sunland Park Nonattainment Area, it is assumed that 41% of the permits issued for burning were for weeds, 13% for grass, 13% for leaves, and 31% for woody materials.

G1. Weeds:

Assumptions: 1) Even though most were unspecified weeds, assume 75% were for tumbleweeds; 2) For lot or yard burning, assume one acre for the calculations; 3) For fields use 76 acres (94,719 cultivated acres in Dona Ana County divided by 1,691 farms = 75.5 acres/farm); and 4) Of the 21 burns: 16 for tumbleweeds (all 1 acre lots), 5 for miscellaneous mixed weeds (2 one acre lots + 3 fields at 76 acres each). No NOx emissions are given for vegetative burning in AP-42, so only CO and VOC will be reported.

Tumbleweeds:

16 acres x 0.1 ton/acre = 1.6 tons of fuel
CO: 309 lbs/ton x 1.6 tons = 494.4 lbs of CO (0.25 tons)
VOC: 1.5 lbs/ton x 1.6 tons = 2.4 lbs of VOC (0.0012 tons)

Unspecified weeds:

(76 x 3) + 2 = 230 acres
230 acres x 3.2 tons/acre = 736 tons of fuel
CO: 85 lbs/ton x 736 tons = 62,560 lbs of CO (31.28 tons)
VOC: 9 lbs/ton x 736 tons = 6624 lbs of VOC (3.31 tons)

G2. Grass:

Assumptions: 1) Two of the 4 burns appear to be fields, so use 76 acres per field; and 2) The other two burns were assumed to be 1 acre lots. Since AP-42 has no fuel loading factors for grass, fuel loading factors for wheat (a species of grass) were used instead.

(76 x 2) + 2 = 154 acres
154 acres x 1.9 tons/acre = 292.6 tons of fuel
Now use grass emission factors:
CO: 292.6 tons x 101 lbs/ton = 29,552.6 lbs of CO (14.78 tons)
VOC: 292.6 tons x 15 lbs/ton = 4389 lbs of VOC (2.19 tons)

G3. Leaves:

Assumptions: 1) One of the 4 burns was identified as a field (i.e. 76 acres), while another was identified as a yard (i.e. 1 acre), while the last 2 were not specified. So split the last 2 into 1 field and 1 yard giving a total of 2 fields and 2 yards. Since the type of leaves were never specified in the permits, factors for unspecified leaves from AP-42 were used.

There are also no fuel loading factors for leaf burning in AP-42, so fuel loading factors for unspecified orchard crops (as tree leaves) were used instead.

(76 x 2) + 2 = 154 acres
154 acres x 1.6 tons/acre = 246.4 tons of fuel
CO: 246.4 tons x 112 lbs/ton = 27,596.8 lbs of CO (13.80 tons)
VOC: 246.4 tons x 28 lbs/ton = 6899.2 lbs of VOC (3.45 tons)

G4. Woody vegetation:

Assumptions: 1) Assume 7 of the 9 burns are of pecan wastes, place them into unspecified orchard crops (AP-42) and use 33 acres per burn (Dona Ana County has 17,600 acres of pecans divided by 535 orchards = 32.9 acres per orchard); and 2) Two of the 9 burns were for salt cedar. Use unspecified forest residues (AP-42), and since the salt cedars were on vacant lots, assume 1 acre lots.

Pecans:

33 x 7 = 231 acres
231 acres x 1.6 tons/acre = 369.6 tons of fuel
CO: 369.6 tons x 52 lbs/ton = 19,219.2 lbs of CO (9.61 tons)
VOC: 369.6 tons x 8 lbs/ton = 2956.8 lbs of VOC (1.48 tons)

Salt Cedar:

2 acres x 70 tons/acre = 140 tons of fuel
CO: 140 tons x 140 lbs/ton = 19,600.0 lbs of CO (9.80 tons)
VOC: 140 tons x 19 lbs/ton = 2660.0 lbs of VOC (1.33 tons)

Table 3-4 Summary of emissions from agricultural burning.

VEGETATION TYPE	EMISSIONS IN TONS/YEAR		
	CO	NOx	VOC
Weeds			
Tumbleweeds	0.25	na	nil
Other	31.28	na	3.31
Grass	14.78	na	2.19
Leaves	13.80	na	3.45

Woody			
Pecans	9.61	na	1.48
Salt Cedar	9.80	na	1.33
TOTALS	79.52	na	11.76
OZONE SEASON DAY	0.367 (734.0 lbs)	na	0.0543 (108.6 lbs)

na - not available (i.e. no data in AP-42)

Ozone season day calculations are based on 7 days/week and 42% of the activity in the ozone season.

SUMMARY OF EMISSIONS FROM ALL OPEN BURNING SOURCES:
Agricultural burning and open burning of trash account for 97% of CO, essentially all of the NOx, and 98% of VOC emitted within the nonattainment area.

Table 3-5. Summary of all open burning sources. TPY = tons/year; PPD = pounds/day.

OPEN BURNING SOURCE	CO		NOx		VOC	
	TPY	PPD	TPY	PPD	TPY	PPD
Household trash	66.79	366.0	4.72	26.0	23.58	129.4
Structures	0.0156	0.0857	0.00036	0.00198	0.00286	0.0157
Grass	4.60	30.37	-----	-----	0.684	4.51
Orchard heaters	0.0	0.0	0.0	0.0	0.0	0.0
Forest fires	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	79.52	734.0	-----	-----	11.76	108.6
TOTALS	150.92	1130.46 (0.565 tons)	4.72	26.00 (0.013 tons)	36.03	242.52 (0.121 tons)

SUMMARY OF ALL COMBUSTION SOURCES

Open burning accounts for 96% of CO, 16% of NOx, and 97% of VOC emissions. As already seen, agricultural burning and trash burning account for most of the open burning.

Table 3-6. Summary of all area combustion sources. TPY = tons/year; TPD = tons/day.

COMBUSTION SOURCE	CO		NOX		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Industrial	2.495	0.00772	12.93	0.0400	0.380	0.00117
Commercial	0.808	0.00259	3.538	0.0113	0.176	0.00056
Residential	3.721	0.0102	9.210	0.0253	0.675	0.00185
Open burning	150.92	0.565	4.72	0.013	36.03	0.121
TOTALS	157.94	0.586	30.40	0.0896	37.26	0.124

EVAPORATIVE COMBUSTION SOURCES

A. Aircraft Refueling:

Monthly fuel consumption figures were obtained from the Santa Teresa Airport Manager, Vernon Wilson. Mr. Wilson estimated that 6000 gallons of fuel was used per month in 2002. 50% of the fuel used at the Santa Teresa Airport is Jet A-1 and 50% is the 100LL gasoline. To calculate the emissions from the airport theAP-42 emission factors for kerosene and gasoline, via splash filling, were used.

		AP-42	VOC Emissions		
	Fuel	emission factor	Annual		Daily
Fuel Type	(gal/month)	(lbs VOC/1000 gal)	lbs/year	tons/year	lbs/day
Jet –A1	3000	0.04	1.44	0.00072	0.00395
100LL	3000	10.2	367.2	0.1836	1.00602
Totals			368.64	0.18432	1.00997
					(5.04×10^{-4} tons)

Ozone season daily emissions are based on 7 days/week operation and 25% activity per season.

B. Asphalt Paving

The New Mexico Highway Department was contacted and only one cubic yard (CY) of asphalt was used in the Sunland Park nonattainment area for the year 2002. It was stated that this was an odd year and that on average 96.6 CY of asphalt is used in the Sunland Park nonattainment area. The asphalt used during 2002 was a hot cold lay patching material. The Binder for this material is a rapid cure emulsion (HFE 90) [HFE = High Float Emulsion]. Calculating:

(6.4 barrels) x 9.2 lb/barrels = 58.88 lbs (.029 tons) of VOC annually

Daily emissions are .16 lbs/day (0.00008 tons/day) and based on 7 days/week and 25% of annual activity in the ozone season.

C. Bioprocess:

Bioprocess sources include bakeries, wineries, breweries and distilleries. Of these four, there is only one bakery within the nonattainment area. The bakery is small, employing only 6 people and VOC emissions are not known. So, the EPA emission factor in guidance documents of 0.11 tons VOC per employee was used.

6 employees x 0.11 tons/employee = .66 tons of VOC annually

Daily emissions are 3.6 lbs/day (0.0018 tons/day) and based on 7 days/week operation and 10% of annual activity in the ozone season (50% winter, 20% spring, and 20% fall).

D. Catastrophic or Accidental Chemical Spills and Releases:

Office of Emergency Management, of the Dona Ana County Planning Department, was contacted regarding any chemical spills or releases in 2002. During 2002, no catastrophic or accidental chemical spills or releases occurred within the Sunland Park nonattainment area or within the County.

E. Surface Coating Operations:

Surface coating operations can include architectural coatings, auto refinishing, traffic markings, furniture and fixtures, metal containers, new automobiles, machinery and equipment, appliances, miscellaneous transportation equipment, sheet strip and coil coatings, factory finished wood, electrical insulation, high-performance maintenance coatings, marine coatings, and any other miscellaneous coatings. Largely due to the small population of the nonattainment area very few of these types of operations were identified within the Sunland Park area. Three of these surface coating operations were clearly identified though: 1) appliances, 2) architectural, and 3) auto refinishing. These will be summarized individually below.

E1. Architectural Coatings:

Only one source was inventoried that frequently uses paints and thinners: a door painting and finishing operation. In addition, a per capita emission factor was used for all other non-industrial surface coatings (e.g. painting of private homes, commercial businesses etc.).

- Door painting/finishing operation. Annually they use: 72 gal of paint, 19 gal of thinner, and 48 gal of lacquer. Again, the simplest approach is to assume that all of the thinner and lacquer volatilizes. The calculations:

Paint: 72 gal x (5.66 kg/gal) = 407.52 kg

407.52 kg x (1 Mg/10^3 kg) x (560 kg/Mg) = 228.2 kg of VOC

Thinner: 19 gal x (3 kg/gal) = 57 kg of VOC

Lacquer: 48 gal x (5.66 kg/gal) = 271.68 kg

271.68 kg x (1 Mg/10^3 kg) x (770 kg/Mg) = 209.2 kg of VOC

Total VOC from door painting: 228.2 + 57 + 209.2 = 494.4 kg (1089.9 lbs or 0.55 tons)

Non-industrial surface coating. This includes non-manufacturing emissions and would cover painting of private homes and commercial offices. The per capita architectural surface coating emission factor (from AP-42) for these activities is 2.09 kg/yr (4.6 lbs/yr). The estimated nonattainment area population is 16,269. The calculation:

16,269 x 2.09 kg/yr = 34,002.21 kg/yr (74,961.27 lbs/yr or 37.48 tons/yr)

Summary of all sources within architectural coatings:

0.55 + 37.48 = 38.03 tons of VOC

Daily emissions are 208.35 lbs/day (.1042 tons/day) and based on 7 days/week (since non-industrial is the largest portion) and 25% activity in the fall ozone season (17% winter, 25% spring, 33% summer).

E.2. Auto Refinishing:

Insufficient information was obtained during the emissions inventory survey that was conducted in Sunland Park nonattainment. Due to this lack of information, the EPA per capita figure (0.84 kg/yr or 1.9 lbs/yr) for auto refinishing emissions was used for the nonattainment area .

16,269 x 0.84 = 14,169.96 kg/yr = 31,239.1 lbs/yr = 15.62 tons/yr.

Daily emissions are 85.58 lbs/day (.0427 tons/day) and based on 7 days/week (since non-industrial is the largest portion) and 25% activity in the fall ozone season (17% winter, 25% spring, 33% summer).

F. Dry Cleaning:

There were no dry cleaning operations identified within the nonattainment area.

G. Graphic Arts:

There were no graphic arts operations identified within the nonattainment area.

H. Leaking Underground Storage Tanks:

The Petroleum Storage Tank Bureau (PSTB) of the NMED currently has records of 17 tanks operating in the Sunland Park nonattainment area in 2002:

A grocery/gas station	6	tanks
Aviation Companys at airport	3	tanks
Border Patrol Station	2	tank
El Paso Electric	2	tank
Brick Manufacturer	2	tank
Sunland Park Racetrack and Casino	2	tank

From a list of both past and present leaking tanks (list dated April 5, 2005) the NMED-USTB reports the following:

Grocery/gas station (Sunland Park) - No further action required for site

Since any suspected leaking tanks are still in the ground and have not been removed, this emission source will be considered insignificant since there is a grand total of only 17 tanks, in which 1 of them has had required clean up.

I. Miscellaneous Other Sources:
A facility that sterilizes medical supplies has reported 4.1 tons/yr of actual VOC emissions (AIRS database). This translates into 8200 lbs/year. Daily emissions are 22.47 lbs/day (0.01123 tons/day) and is based on 7 days/week and 25% activity during the ozone season.

J. Oil and Gas Production:
There are no oil and gas production facilities within the nonattainment area.

K. Pesticide Application:
This source of VOC includes pesticides used in agriculture, on golf courses, sod farms, and in greenhouses and nurseries. Dona Ana County is an important agricultural area within New Mexico and most of the county's agriculture is located near the Rio Grande. A large portion of the nonattainment area is rural and agricultural, especially the northern half. Agricultural pesticide use is the largest component in this emission category.

K1. Agricultural Pesticide Application:

Basic Calculation Procedures: In the EPA guidance document: Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone (1991), VOC emissions were based on the following national figures:

1. The amount of solvent or carrier (i.e. the inert) portion of pesticides was considered 1.45 times the amount of active ingredient (a.i.). In other words, 59% of the total content of a pesticide formulation was inert.
2. The total potential VOC emissions is 2.45 times the amount of active ingredient (a.i.).

Data on pesticide use in New Mexico was obtained from the National Center for Food and Agricultural Policy. Agricultural crop data for Dona Ana County were obtained from the State Agriculture Department in Las Cruces. Volatility (vapor pressure) data were also necessary to do VOC emission calculations. Data on the volatility of pesticides were obtained from a variety of sources including AP 42, the Risk Assessment Information System, and the United States Department of Agriculture: Agricultural Research Services. Since pesticide use data, by crop, were only available on a statewide basis, such data had to be apportioned down to the nonattainment area based on crops grown in the area. Crop data were available by county. The first step was to take pesticide use data and to apportion them down to Dona Ana County based on what crops were grown in the county and what percentage of state production they accounted for.

New Mexico has a large amount of crop production throughout the state. Using state and county data provided by the USDA National Agricultural Statistic Service it was determined which crops were produced in Dona Ana County in 2002. Most of the agricultural land in Dona Ana County is located near the Rio Grande and the

nonattainment area is entirely located near the Rio Grande. The Rio Grande extends 80 miles (north to south) within Dona Ana County of which 18 miles is within the nonattainment area. Hence, agriculture within the nonattainment area was estimated to represent 22.5% (18/80 = 0.225) of agriculture within the county.

Table 3-7. Agriculture in Doña Ana County, New Mexico

CROPS GROWN IN DONA ANA COUNTY	ACRES PLANTED IN NEW MEXICO	TOTAL ACRES IN DONA ANA COUNTY	PERCENTAGE OF CROP IN DONA ANA COUNTY
Alfalfa/Hay	260,000	20,000	7.7
Corn	135,000	13,000	9.63
Cotton	61,100	14,800	24
Chile	18,000	4,500	25
Onions	8,100	4,500	55
Pecans	36,000	26,000	72

Table 3-8. How pesticide use was apportioned down to: 1) the county level, then 2) down to the level of the Sunland Park nonattainment area.

LBS A.I./YEAR USED IN NEW MEXICO	CROP THAT CHEMICAL IS APPLIED TO	PERCENT OF CROP IN DONA ANA COUNTY	NON-ATTAINMENT AREA AS A PERCENT OF COUNTY	LBS A.I./YEAR USED IN THE NON-ATTAINMENT AREA
4,047	Alfalfa	7.7	22.5	70
38,758	Cotton	24	22.5	2093
42,805	TOTALS			2163

The following is an example calculation using the pesticide 1,3-D.

2,163 lbs a.i./year used in the nonattainment area

2,163 x 1.45 (inert portion factor) = 3,136 lbs of inert ingredients used/year

Calculating VOC from inert ingredients: Since data on pesticide formulations (e.g. emulsifiable concentrate, wettable powder, etc.) were not readily available for pesticides used in this area, an average VOC content was used. From AP-42: the average VOC content of 18 formulations of inert ingredients = 32% by weight. The calculation:

3,136 lbs inert ingredients/year x 0.32 = 1003.6 lbs of VOC emitted from inert ingredients in metribuzin

Calculating VOC from active ingredients: Since data were not available on whether surface application or soil incorporation techniques were used on the various pesticides, all determinations were based on the worst case scenario of surface application. Pesticides applied

to the soil surface will volatilize more quickly and to a greater extent when compared to soil incorporation. Malathion, which has a vapor pressure of $< 1 \times 10^{-5}$ mm Hg, has a surface application VOC emission factor of 350 kg/Mg or 700 lbs/ton. This means that 35% of the active ingredient may volatilize.

2,163 lbs a.i./year used in the nonattainment area
2,163 x 0.35 = 747.6 lbs of VOC emitted from a.i. in metribuzin

Summing VOC from inert and a.i.: 1003.6 + 747.6 = 1751.2 lbs of total VOC emitted from malathion.

Tables 1-9 though 1-11 summarize VOC emissions from all agricultural pesticide use in the nonattainment area. A grand total of 105,658.5 lbs (52.82 tons) of pesticide active ingredients (a.i.) were estimated to be used within the nonattainment area annually. This results in VOC emissions of 24.44 tons per year. Seventy-five percent of these emissions come from the most volatile pesticide group (Table 2.5-I). This group also has the greatest use in terms of tons of a.i. per year. The pesticide 1,3-D accounts for 94% of the emissions in this group.

Table 3-9. Pesticides with vapor pressures <1 x 10 -6 mmHg. Surface Application emission factor assumed

PESTICIDE	**LBS. of Active Ingredient (a.i.) used in the Nonattainment Area**	**LBS. VOC EMITTED (Lbs a.i. multiplied by the emission factor - 0.068)**
2,4 - DB	38	2.5
ATRAZINE	1732	117
BENSULIDE	635	43.18
BIFENTHRIN	16	1.08
CARBOFURAN	935	63.58
CETHODIM	26	1.77
CYANAZINE	1349	91.73
CYFLUTHRIN	9	.612
CYPERMETHRIN	75	5.1
DIMETHIPIN	46	3.12
DIURON	14	.95
ENDOSULFAN	115	7.82

ENDOTHALL	4	.27
ESFENVALERATE	44	2.99
ETHEPHON	311	21.15
FLUAZIFOP	534	36.31
FLUMETSULAM	1	0.068
FLUOMETURON	55	3.74
GLYPHOSATE	1170	79.56
IMAZETHAPYR	113	7.68
IPRODIONE	270	18.36
LACTOFEN	37	2.5
LAMDACYHALOTHRIN	70	4.76
MEPIQUAT CHLORIDE	39	2.65
MSMA	367	24.9
MYCLOBUTANIL	15	1.02
NAPROPAMIDE	1154	78.47
NICOSULFURON	8	.54
NORFLURAZON	270	18.36
OXYFLUORFEN	150	10.2
PARAQUAT	264	17.95
PERMETHRIN	131	8.91
PRIMISULFURON	5.5	.37
PROFENOFOS	334	22.7
PROFENOFOS	3	.20
PYRITHIOBAC	22	1.5
SETHOXYDIM	219	14.89
SODIUM CHLORATE	6462	439.42

TEBUFENOZIDE	103	7.0
TERBACIL	66	4.48
THIDIAZURON	382	25.9
THIODICARB	184	12.5
42 CHEMICALS	17,777.5	1207.79 (0.6 tons)

Table 3-10. Pesticides with vapor pressures 1 x 10-4 to 1 x 10 -6 mmHg. Surface Application emission factor assumed

PESTICIDE	LBS. of Active Ingredient (a.i.) used in the Nonattainment Area	LBS. VOC EMITTED (LBS. a.i. multiplied by the emission factor -0.35)
2, 4 - D	206	72.1
ACEPHATE	1002	350.7
ALACHLOR	825	288.75
ALDICARB	723	253.13
BENEFIN	805	281.75
BROMOXYNIL	40	14
CHLORPYRIFOS	6322	2212.7
CLOPYRALID	2	.7
DCPA	738	2583
DIAZINON	19	6.65
DICAMBA	203	71.05
DIMETHOATE	209	73.15
MALATHION	2163	757.05
METHOMYL	678	237.3
METHYL PARATHION	501	175.35
METOLACHLOR	2609	913.15
METRIBUZIN	121	42.35

PESTICIDE	LBS. of Active Ingredient (a.i.) used in the Nonattainment Area	LBS. VOC EMITTED (LBS. a.i. multiplied by the emission factor -0.35)
PENDIMETHALIN	2369	829.15
PROMETRYN	2754	963.9
TRIBUFOS	2009	703.15
20 CHEMICALS	24,298	10,829.08 (5.4 tons)

Table 3-11. Pesticides with vapor pressures >1 x 10 -4 mmHg. Surface Application emission factor assumed

PESTICIDE	LBS. of Active Ingredient (a.i.) used in the Nonattainment Area	LBS. VOC EMITTED (LBS. a.i. multiplied by the emission factor -0.58)
1,3 -D	59,723	34,639
CHLOROTHALONIL	99	51.04
CLOMOZONE	45	26.1
DICROTOPHOS	37	21.46
DISULFOTON	405	234.9
EPTC	104	60.32
OXAMYL	760	440.8
PCNB	519	301.02
PROPARGITE	91	52.78
TRIFLURALIN	1800	1044.0
10 CHEMICALS	63,583	36,871.42 (18.44 tons)

VOC Emissions summary of Tables 1-9, 1-10, and 1-11:

1-9: 0.6 tons
1-10: 5.4 tons

1-11: 18.44 tons

Grand Total 24.44 tons of VOC from pesticide a.i.(active ingredients)

L. Service (Gasoline) Stations:
Vehicle refueling emissions from gasoline service stations is included in On-Road Mobile Sources within this report.

M. Solvent Use:
Commercial and consumer solvent use can be calculated using EPA AP-42 per capita emission factors (4.2 kg/yr or 9.2 lbs/yr).

4.2 kg/yr x 16,269 people = 68,329.8 kg of VOC (151,008 lbs or 75.50 tons)

Since 31% of this is considered nonreactive, multiply the above figure by 69%, leaving 52.09 tons of VOC emitted annually. Guidance and emission factors in the draft EIIP (Emissions Inventory Improvement Program) yields similar results (7.99 lbs/person/year): 129,989.3 lbs or 65.00 tons per year.

N. Surface Cleaning:
The automobile repair shops and body shops could be included here but since they have been included elsewhere (e.g surface coatings and solvent use) they should not be counted here in order to prevent double counting. No other types of surface cleaning operations were identified.

O. Synthetic Organic Chemical Storage Tanks
None of these were identified.

P. Tank Breathing Losses:
This category applies to fuel or other chemical storage tanks. The general equation for this determination is L_T (total losses) = L_S (standing losses) + L_W (working losses). The following tanks were identified:

Table 3-12. Summary of tank source, content, and size.

SOURCE	TANK CONTENTS	TANK SIZE (gallons)
Grocery/gas station	gasoline	3 @ 2000 = 6000
		2 @ 10,000 = 20,000
	diesel	15,000
Brick Manufacturing	gasoline	14,000

	diesel	5000
Race Track	gasoline diesel	2000 2000
Aviation Co.	gasoline	6000
Border Patrol	gasoline diesel	12000 6000
TOTALS		60,000 gal - gasoline 28000 gal - diesel

The same assumptions will be used for this inventory as were used for the 1995 inventory. These assumptions include that each tank is refilled once per month (which may or may not be an overestimate), the emissions factor (1 lb of VOC/10^3 gal of throughput) for underground tank breathing losses will be doubled (2 lbs/10^3 gal of throughput) for aboveground tanks to adjust for potentially greater emissions.

P1. Underground gasoline tanks (grocery/gas stations)

26,000 gal x 12 months = 312,000 gal/yr = 312 x 10^3 gal/yr

312 x 10^3 gal/yr x 1 lb/10^3 gal = 312 lbs of VOC/yr (0.2 tons)

P2. Aboveground gasoline tanks (the brick manufacturing/aviation/race track/border patrol)

34,000 gal x 12 months = 408,000 gal/yr = 408 x 10^3 gal/yr

408 x 10^3 gal/yr x 2 lbs/10^3 gal = 816 lbs of VOC/yr (0.4 tons)

P3. Aboveground diesel tanks (the brick manufacturing/ race track/border patrol)

12,000 gal x 12 months = 144,000 gal/yr = 144 x 10^3 gal/yr

144 x 10^3 gal/yr x 2 lbs/10^3 gal = 288 lbs of VOC/yr (0.14 tons)

P4. Underground diesel tanks (grocery/gas station)

15,000 x 12 months = 180,000 gal/yr = 180 x 10^3 gal/yr

180 x 10^3 gal/yr x 1 lb/10^3 gal = 180 lbs of VOC/yr (0.1 tons)

P5. Summary of Tank Breathing Losses.

0.2 tons + 0.4 tons + 0.14 tons + 0.1 tons = 0.84 tons of VOC (1680.0 lbs)

Ozone season day emissions were calculated to be 4.6 lbs/day (0.0023 tons/day). This was based on 7 days/week operation and 25% activity in the ozone season.

Q. Tank, Tank Truck, Rail Car, Barge, and Drum Cleaning:

None of these activities were identified within the nonattainment area.

R. Tank Truck Unloading - Tank Loading:

This category also applies to fuel or other chemical storage tanks. The following tanks were identified (same tanks as listed under Tank Breathing Losses):

Table 3-13. Summary of tank source, content, and size for tank unloading and loading.

SOURCE	TANK CONTENTS	TANK SIZE (gallons)
Grocery/gas station	gasoline diesel	3 @ 2000 = 6000 2 @ 10,000 = 20,000 15,000
Brick Manufacturing	gasoline diesel	14,000 5000
Race Track	gasoline diesel	2000 2000
Aviation Co.	gasoline	6000
Border Patrol	gasoline diesel	12000 6000
TOTALS		60,000 gal - gasoline

		28000 gal - diesel

The same assumptions will be used for this inventory as were used for the 1995 inventory. These assumptions include that each tank is refilled once per month (which may or may not be an overestimate) and that the worst case estimate, the splash fill emission factor (11.5 lb of VOC/10^3 gal of throughput) will be used from AP 42 .

R1. Underground gasoline tanks (grocery/gas stations)

26000 gal x 12 months = 312,000 gal/yr = 312 x 10^3 gal/yr

312 x 10^3 gal/yr x 11.5 lb/10^3 gal = 3,588 lbs of VOC/yr (1.8 tons)

R2. Aboveground gasoline tanks (the brick manufacturing/aviation/race track/border patrol)

34,000 gal x 12 months = 408,000 gal/yr = 408 x 10^3 gal/yr

408 x 10^3 gal/yr x 11.5 lbs/10^3 gal = 4692 lbs of VOC/yr (2.3 tons)

R3. Aboveground diesel tanks (the brick manufacturing/ race track/border patrol)

12,000 gal x 12 months = 144,000 gal/yr = 144 x 10^3 gal/yr

144 x 10^3 gal/yr x 11.5 lbs/10^3 gal = 1656 lbs of VOC/yr (0.83 tons)

R4. Underground diesel tanks (grocery/gas station)

15,000 gal x 12 months = 180,000 gal/yr = 180 x 10^3 gal/yr

180 x 10^3 gal/yr x 11.5 lbs/10^3 gal = 2070 lbs of VOC/yr (1.04 tons)

Summary of Tank Unloading/Loading Emissions:

1.8 tons + 2.3 tons + 0.83 tons + 1.04 tons = 5.97 tons of VOC (11,940 lbs).

Ozone season daily emissions were calculated to be 32.71 lbs/day (0.0164 tons/day). This was based on 7 days/week operation and 25% activity during the ozone season.

S. Waste Treatment Facilities:

This category includes municipal landfills, industrial and municipal wastewater, and wastewater package plants. Of these, there is one large municipal landfill and one wastewater treatment facility.

S1. Camino Real Landfill.

This data was obtained from the February 10, 1999 permit application and December 15, 2003 Compliance Report submitted by the landfill to fulfill NSPS (40 CFR Part 60 Subpart WWW) requirements. In August of 2000, the landfill installed a gas collection and control system (GCCS), which significantly reduced their VOC emissions. The GCCS consists of 36 vertical extraction wells and buried transmission piping to collect and convey landfill gas to a utility flare for destruction. Destruction of landfill gas is achieved by routing collected gas to a blower/flare assembly via a blower-induced vacuum.

The Tier III Calculation method used in the February 10, 1999 permit application from the Camino Real Landfill is state as 69 tons/yr without the control system in place. With the control system the emissions are reported to be negligible. Since the GCCS was install in August of 2000 this control system has been in operation, thus reducing NMOC emissions to a negligible level.

S2. Municipal Wastewater - Sunland Park City Wastewater Treatment Plant:

EPA's general emission factor is 1.1 x 10^{-4} lbs VOC/gal of treated wastewater. VOC emissions are directly proportional to industrial effluent (the national default is 16% of wastewater is industrial in origin). The Sunland Park treatment plant handles 500,000 gal/day. So the calculation is as follows:

498,000 gal/day x 365 days x 1.1 x 10^{-4} lbs VOC/gal x 0.16 x 1 ton/2000 lbs = 1.60 tons/year of VOC (3200 lbs)

Ozone season day emissions were calculated as 0.00440 tons/day (8.79 lbs/day). These are based on 7 days/week operation and 25% activity in the fall (15% winter, 25% spring, and 35% summer).

SUMMARY OF ALL EVAPORATIVE EMISSION SOURCES

From summary data in Table 1-14 (below) the most significant evaporative sources of VOC are: 1) the landfill, 2) architectural coatings, 3) solvent use, and 4) pesticide use. These four sources combined account for 97% of all emissions under the worst case situation and 88% under the best case situation. Worst and best case situations were based on different methods for estimating emissions from the landfill. Under the worst case the landfill accounts for 84% of all evaporative emissions. Under the best case the landfill accounts for only 32% of emissions.

Table 3-14. Summary of all evaporative sources. TPY = tons/year; PPD = pounds/day.

SOURCES		VOC EMISSIONS	
		TPY	PPD
AIRCRAFT REFUELING		0.184	1.01
ASPHALT		.029	.016
BIOPROCESS		.66	3.6
CATASTROPHIC RELEASES		0.0	0.0
SURFACE COATING	ARCHITECTURAL	38.03	208.38
	AUTO REFINISHING	15.62	85.58
DRY CLEANING		0.0	0.0
GRAPHIC ARTS		0.0	0.0
LEAKING UNDERGROUND STORAGE TANKS		0.0	0.0
MISCELLANEOUS OTHER SOURCES		4.1	22.47
OIL AND GAS OPERATIONS		0.0	0.0
PESTICIDE USE		24.44	133.91

SERVICE (GASOLINE) STATIONS		in Mobile 5 model	in Mobile 5 model
SOLVENT USE		65.00	356.16
SURFACE CLEANING		0.0	0.0
SYNTHETIC ORGANIC CHEMICAL STORAGE TANKS		0.0	0.0
TANK BREATHING LOSSES		0.84	4.6
TANK, TANK TRUCK, RAIL CAR, BARGE, AND DRUM CLEANING		0.0	0.0
TANK TRUCK UNLOADING/LOADING		5.97	32.71
WASTE TREATMENT	LANDFILLS	Negligible	Negligible
	WASTE WATER	1.60	8.79
GRAND TOTALS		156.47	857.26

Point Source Emissions

This section presents data on point sources: 1) within the Sunland Park ozone nonattainment area, and 2) within a 25 mile radius of the nonattainment area. According to U.S. EPA guidance on ozone nonattainment area SIP inventories, sources located within the nonattainment area and emitting 100 or more tons of carbon monoxide (CO), 100 or more tons of nitrogen oxides (NOx), or 10 or more tons of volatile organic compounds (VOC) should be inventoried individually as point sources. In addition, the 1990 Clean Air Act Amendments specify that NOx sources greater than 25 tons must submit emission statements within three years of designation as a nonattainment area. Such sources must submit reports annually thereafter. Hence, this SIP inventory will include 25 ton NOx sources as point sources as well. Within a 25 mile radius of the nonattainment area, the inventory includes sources emitting 100 tons or more of carbon monoxide, nitrogen oxides or volatile organic compounds. The 25 mile radius was measured from the periphery of the nonattainment area and includes most of El Paso County, Texas and much of Las Cruces, New Mexico. This radius would also encompass much of Juarez, Mexico, however due to lack of data, sources in Mexico are not included in this discussion.

SOURCES WITHIN THE NONATTAINMENT AREA

Under the above definitions, there are two sources considered as point sources within the nonattainment area: El Paso Electric Co. and Foamex International Inc. El Paso Electric is a power generation facility and a point source for CO and NOx. Foamex manufactures foam products such as automobile seats and is a point source for VOC.

A. El Paso Electric:

Emissions data from the EPA AIRS database for 1995 are summarized below:

Table 3-15. Emissions from El Paso Electric Co. TPY = tons/year; TPD = tons/day; CEM = continuous emission monitors.

POLLUTANT	AIRS EMISSIONS DATA (TPY)		ACTUAL EMISSIONS (TPY) WITH RULE EFFECTIVENESS	DAILY EMISSIONS (TPD)
	ALLOWABLES	ACTUALS		
CO	3437.6	144.7	173.64	0.48
NOx	3383.8	895.2	1074.24	3.0
VOC	21.5	24.65	29.58	0.081

In 2002, El Paso Electric was a Title V source within the Sunland Park nonattainment area. **Look at permit.** EPA's rule effectiveness procedure was applied to the actual emissions data. Rule effectiveness procedures adjust emissions to account for times of rule non-compliance. El Paso Electric, being a major point source, has a few rules that apply to it. EPA's default rule effectiveness of 80% compliance was applied to the actual emissions data.

Although El Paso Electric did not run at full capacity during all of 2002, 365 days per year operation and 25% of annual activity within the ozone season will be used for the tons per day for a more conservative estimate (e.g. 173.64ton/yr of CO ÷ 365 = 0.48tons/day).

B. Foamex International Inc:

Foamex International Inc. is not directly located within the boundary of the nonattainment area, but due to its close proximity to the nonattainment area (less that one mile) and that it was included as a point source in the 1995 inventory it was included in this section. Their emissions are summarized below:

Table 3-16. Emissions from Foamex International Inc. TPY = tons/year; TPD = tons/day.

POLLUTANT	AIRS EMISSIONS DATA (TPY)		ACTUAL EMISSIONS (TPY) WITH RULE EFFECTIVENESS	DAILY EMISSIONS (TPD)
	ALLOWABLES	ACTUALS		
CO	39.1	15.614	18.74	0.072
NOx	14.4	9.55	11.46	0.044
VOC	134.1	53.84	64.61	0.25

Again, EPA's default rule effectiveness of 80% was used. The ozone season day determination was based on 25% of annual activity within the 3 month ozone season and 5 days/week operation (e.g. 24.41 tons/year CO × 0.25 ÷ 5 ÷ 13 = 0.094 tons/day).

SOURCES WITHIN A 25 MILE RADIUS OF THE NONATTAINMENT AREA

A. Sources within New Mexico:

A.1 New Mexico State University Physical Plant:

Based on estimated actual emissions data in AIRS, only one source was over 100 tons per year for any of the three inventoried pollutants. This source was the New Mexico State University Physical Plant. Emissions data from AIRS are as follows:

Table 3-17. Emissions from the New Mexico State University Physical Plant.

TPY = tons/year; TPD = tons/day.

POLLUTANT	AIRS EMISSIONS DATA (TPY)		ACTUAL EMISSIONS (TPY) WITH RULE EFFECTIVENESS	DAILY EMISSIONS (TPD)
	ALLOWABLES	ACTUALS		
CO	82.5	5.22	6.26	0.017
NOx	215.5	108.88	130.66	0.358
VOC	11.6	7.98	9.58	0.026

Default rule effectiveness procedures of 80% were applied to this source. Ozone season day determinations were based on 365 days/year operation and 25% of annual activity in the 3 month ozone season.

A.2. Other Sources from 1995 Inventory:

It may be pertinent to note that in 1995, two other sources were included in this portion of the inventory. Those sources were: the El Paso Natural Gas - Afton Compressor Station and the Las Cruces Waste Water Treatment Facility. For continuity these two sources have been included in this inventory. From AIRS:

Table 3-18. Emissions from the El Paso Natural Gas - Afton Compressor Station and the Las Cruces Waste Water Treatment Facility for 2002. TPY = tons/year.

SOURCE	POLLUTANT	AIRS EMISSIONS DATA (TPY)		ACTUAL EMISSIONS (TPY) WITH RULE EFFECTIVENESS
		ALLOWABLES	ACTUALS	
Afton Compressor Station	CO	97.2	2.2	2.64 (0.007 TPD)
	NOx	612	13.9	16.68 (0.045 TPD)
	VOC	7.6	5.7	6.84 (0.018 TPD)
Las Cruces Waste Waster	CO	29.8	14.95	17.94 (0.049 TPD)
	NOx	96.1	45.33	54.40(0.149 TPD)

Treatment Facility	VOC	7.9	3.79	4.55 (0.012 TPD)

B. Sources within El Paso County, Texas:
Data on El Paso sources were also extracted from AIRS or directly from the Texas Commission on Environmental Quality (TCEQ) (Appendix K) and summarized below (Table 2.4-E). Some of the data obtained from TCEQ were more recent than what is currently available in AIRS. All of these figures for El Paso, Texas are based on rule effectiveness as presented in AIRS.

Table 3-19. Point sources in El Paso, TX emitting 100 or more tons per year of either CO, NOx, or VOC: Annual emissions.

SOURCE	ANNUAL EMISSIONS (TPY = tons per year)			YEAR OF MOST RECENT INVENTORY*
	CO TPY	NOx TPY	VOC TPY	
Border Steel Mills	190.74	85.15	4.47	2002
Chevron U.S.A. Products	657.16	720.29	232.56	2002
Chevron USA Inc.	149.12	440.92	110.03	2002
El Paso Electric Co.	552.00	1717.10	38.10	2002
El Paso Natural Gas Co.	116.37	454.79	16.82	2002
Phelps Dodge Corporation	276.31	129.30	9.58	2002
TOTALS	1941.70	3547.55	411.56	

* Data obtained from TCEQ.

The following table (2-6) presents ozone season daily emissions (in pounds per day = PPD). All data were extracted from AIRS and all figures are with rule effectiveness applied.

Table 3-20. Point sources in El Paso, TX emitting 100 or more tons per year of either CO, NOx, or VOC: Daily emissions for the ozone season.

	DAILY EMISSIONS - OZONE SEASON (PPD = pounds per day)	YEAR OF MOST

SOURCE	CO PPD	NOx PPD	VOC PPD	RECENT INVENTORY
Border Steel Mills	1045.15	466.57	24.49	2002
Chevron U.S.A. Products	3600.87	3946.79	1274.30	2002
Chevron USA Inc.	817.09	2416.00	602.90	2002
El Paso Electric Co.	3024.65	9,408.76	208.76	2002
El Paso Natural Gas Co.	637.64	2492.00	92.16	2002
Phelps Dodge Corporation	1514.02	708.49	52.49	2002
TOTALS	10,638.55 (5.3 tons)	19,438.61 (9.72 tons)	2255.1 (1.13 tons)	

It is assumed that PPD emissions are based on 365 days per year of operation. Actual figures for the 2002 ozone season were not available in AIRS or TCEQ for the so these were estimated in order arrive at a summary figure.

SUMMARY OF POINT SOURCE EMISSIONS

Table 2-7, below, summarizes all point sources emissions within the nonattainment area and within a 25 mile radius (Las Cruces and El Paso). Point Sources located in El Paso account for 73.3% of the NOx emissions; 90% of CO emissions; and 78% of VOC emissions in the region. Large point sources within a 25 mile radius outside of the Sunland Park nonattainment area (including both New Mexico and Texas) account for 78% of the NOx emissions; 91% of the CO emissions; and 82% of the VOC emissions in the region. The Sunland Park nonattainment area only accounts for 22% of the NOx emissions; 9% of the CO emissions; and 23% of the VOC emissions for the region. Due to the limited hours for operation by El Paso Electric in 2002, CO emissions have been reduced by 95.5% since the 1995 Sunland Park emissions inventory.

Table 3-21. Summary of point source emissions in the Sunland Park area.
TPY = tons/year; TPD = tons/day.

POINT SOURCE LOCATIONS	CO		NOx		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Within the Sunland Park Nonattainment Area (NA) - 2	192.38	0.552	1085.7	3.044	94.19	0.331

sources						
Outside NA - NM - 3 source	26.84	0.073	201.74	0.552	20.97	0.056
Outside NA - TX – 6 sources	1941.70	5.32	3547.55	9.72	411.56	1.13
TOTALS	2160.92	5.95	4834.99	13.32	526.72	1.52

Mobile Source Emissions

ON-ROAD MOBILE SOURCES

These sources include automobiles, trucks and all vehicles that travel on established roads. The 2002 NEI was used to determine the emissions for both on-road and non-road mobile sources. EPA used Mobile6 to determine the emissions for each state in the United States. Emissions data was provided down to the county level in each state. Using population projections for the Sunland Park nonattainment area and Doña Ana County, emission estimates where made using the on-road and non-road mobile source emissions provided for Doña Ana County. This information was used to determine the mobile emissions for the Sunland Park nonattainment area.

Table 3-22. Summary of emissions from on-road mobile sources in the Sunland Park nonattainment area. See table footnote for vehicle class abbreviations.

VEHICLE CLASS*	DAILY SUMMER-TIME EMISSIONS IN POUNDS		
	CO	NOx	VOC
LDGV	14188.5	1013.2	1287.1
LDGT1	7201.6	470.6	578.1
LDGT2	3751.5	196.6	331.1
HDGV	2755.7	148.1	132.1
LDDV	3.6	3.09	1.5
LDDT	4.7	2.9	2.4
HDDV	1181.4	1787.9	199.1
MC	184.6	4.2	16.8
TOTALS	29271.7 (14.6 tons)	3626.7 1.81 tons	2548.1 (1.27 tons)

* Vehicle class abbreviations are as follows: LDGV = light duty gasoline powered vehicles; LDGT1 = light duty gasoline powered trucks, from 0-6000 lbs gross vehicle weight; LDGT2 = light duty gasoline powered trucks, from 6001-8500 lbs gross vehicle weight; HDGV = heavy duty gasoline powered vehicles; LDDV = light duty diesel powered vehicles, from 0-6000 lbs gross vehicle weight; LDDT = light duty diesel powered trucks; HDDV = heavy duty diesel powered vehicles; and MC = motorcycles.

Gross annual emissions in tons per year are as follows:

CO: ≥5329 tons
NOx: ≤660.6 tons
VOC: ≥463.5 tons

NON-ROAD MOBILE SOURCES

Non-road mobile sources include railroads, aircraft, ships and watercraft, and many other miscellaneous sources such as agricultural vehicles, construction vehicles, light commercial use vehicles, and lawn and garden equipment. These types of sources can be hard to inventory and quantify. For this inventory, data were obtained thru the NEI for 2002.

Criteria pollutants and HAPs were estimated for the 2002 NEI for vehicles and equipment included in EPA's NONROAD Model by running EPA's National Mobile Inventory Model (NMIM) for nonroad sources for 2002. NMIM is a consolidated modeling system that incorporates NONROAD, MOBILE, and a County Database (CDB) in a Java framework. Within each state, counties with similar temperatures and fuel properties were grouped to minimize the number of NONROAD runs required. For each county group, NMIM executes NONROAD once for each month of the year.

Table 3-23. Summary of non-road mobile source emissions for Sunland Park for 2002. TPY = tons/year; TPD = tons/day.

SOURCE CATEGORIES	CO		NOx		VOC	
	TPY	TPD	TPY	TPD	TPY	TPD
Off Road Gas	627.0582	2.315215	4.81254	0.013301	47.07829	0.169446
LPG	14.16104	0.039082	3.655205	0.010021	0.966662	0.00246
CNG	1.936513	0.005284	0.489207	0.001367	0.007835	0
Off Road Diesels	30.35479	0.107225	54.93503	0.194225	6.497799	0.022684
Aircrafts	8.009512	0.020953	1.197965	0.002824	0.471898	0.001367
Railroads	10.68721	0.027968	103.2783	0.221737	3.882591	0.009839
Other	19.43874	0.104218	0.614287	0.003006	7.681643	0.039082
TOTALS	711.6461	2.619945	168.9826	0.446481	66.58672	0.244877

Off road gas sources account for 88% of carbon monoxide (CO) and 70% of volatile organic compounds (VOC), while railroads account for 61% of nitrogen oxides (NOx) emissions in the Sunland Park ozone nonattainment area. Daily ozone season emissions are based on 7 days/week operation and 25% of annual activity in the ozone season.

Biogenic Source Emissions

This section summarizes emissions from biogenic sources. These are primarily VOC emissions from vegetation, but also include nitrogen oxides (mainly nitrous oxide, NO) from soil microbes. The biogenic emissions data for the Sunland Park nonattainment area has been taken from the 2002 NEI.

Table 3-24. County-wide biogenic emissions for Doña Ana County, New Mexico

Units	Isoprene	Terpenes	Other VOC	NOx
Tons/year	9347.5	8943.8	29,738.3	522.1
Tons/Day	33.4	31.9	106.2	1.86
Lb/Day	66,767.8	63,884.3	212,414.3	3729.3

The Sunland Park nonattainment area is approximately 42 square miles in area. This area can be divided into the following two portions: 1) the northern (narrower) portion, running from the north boundary at latitude 32° 00' southwards to about latitude 31° 49', is 3.5 miles wide by 6.25 miles high = 21.88 sq. miles; and 2) the southern (wider) portion, running from 31° 49' southwards to the Mexico border, is about 8 miles wide by 2.5 miles high = 20.00 sq. miles). Next, dividing 42 sq. miles by 3804 total square miles within Dona Ana County makes the nonattainment area only 1.10% of the county-wide area.

Finally, taking 1.10% of the emission figures in the table above results in the following emissions for the Sunland Park nonattainment area (per day):

Isoprene:	0.367 tons
Terpenes:	0.351 tons
Other VOC:	1.168 tons
NOx:	0.020 tons

All VOC emissions (isoprene + monoterpenes + other VOC) are 1.88 tons/day.

Assuming no emissions or insignificant emissions during cooler dormant seasons of the year, (assumed to be the four months from November to February), daily emissions were multiplied by 240 days (the 8 months from March to October) resulting in the following annual emissions:

VOC:	528.08 tons/yr
NOx:	5.74 tons/yr