

1. Introduction

1.1 Overview

This 2005 periodic PM₁₀ emissions inventory was developed to meet requirements set forth in Title I of the Clean Air Act Amendments of 1990 (CAAA). The CAAA require development of a baseline emission inventory and periodic revisions for areas that fail to meet the National Ambient Air Quality Standards (NAAQS). A portion of Maricopa County is classified as serious nonattainment for PM₁₀.

PM₁₀ is defined as particulate matter less than ten micrometers in diameter. This inventory includes primary emissions of PM₁₀ and PM_{2.5} as well as three particulate matter precursors: nitrogen oxides (NO_x), sulfur dioxides (SO_x) and ammonia (NH₃). The inventory provides emission estimates from point, area, nonroad mobile, onroad mobile and biogenic sources. Note that totals shown in tables may not equal the sum of individual values due to independent rounding.

1.2 Agencies responsible for the emissions inventory

Maricopa County Air Quality Department (MCAQD) has primary responsibility for preparing and submitting the 2005 Periodic PM₁₀ Emissions Inventory for Maricopa County. Point sources and the majority of area, and nonroad mobile source emission estimates were prepared by MCAQD. The Maricopa Association of Governments (MAG) prepared the emission estimates for onroad mobile, biogenic, and some area and nonroad mobile source categories. Table 1.2–1 lists those responsible for inventory preparation and quality assurance/ quality control activities, which are described in the respective chapters.

Table 1.2–1. Chapter authors and QA/QC contacts.

Chapter	Author(s)	QA/QC contact persons
Point Sources	Bob Downing MCAQD (602) 506-6790	Matt Poppen, Eric Raisanen and Dena Konopka MCAQD (602) 506-6790 Cathy Arthur, MAG (602) 254-6300
Area Sources	Matt Poppen, Eric Raisanen and Dena Konopka MCAQD (602) 506-6790 Cathy Arthur, MAG (602) 254-6300	Bob Downing MCAQD (602) 506-6790 Cathy Arthur, MAG (602) 254-6300
Nonroad Mobile Sources	Matt Poppen and Eric Raisanen MCAQD (602) 506-6790	Bob Downing and Dena Konopka MCAQD (602) 506-6790 Cathy Arthur, MAG (602) 254-6300
Onroad Mobile Sources	Cathy Arthur MAG (602) 254-6300	Bob Downing and Dena Konopka MCAQD (602) 506-6790
Biogenic Sources	Cathy Arthur MAG (602) 254-6300	Bob Downing and Dena Konopka MCAQD (602) 506-6790

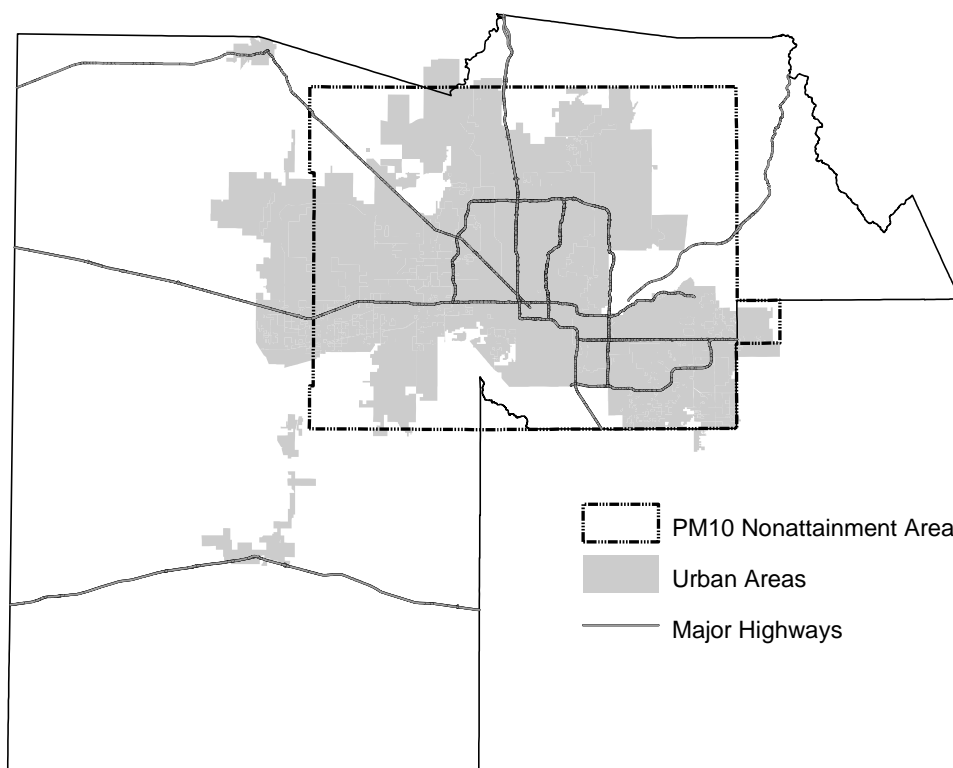
1.3 Temporal scope

Annual and typical daily emissions were estimated for the year 2005, for Maricopa County and the Maricopa County PM₁₀ nonattainment area (NAA).

1.4 Geographic scope

This inventory includes emission estimates for Maricopa County and for the Maricopa County PM₁₀ nonattainment area. Maricopa County encompasses approximately 9,223 square miles of land area, while the Maricopa County PM₁₀ nonattainment area is approximately 2,880 square miles or approximately 31 percent of the Maricopa County land area. A map of Maricopa County and the PM₁₀ nonattainment area is provided in Figure 1.4–1.

Figure 1.4–1. Map of Maricopa County and the PM₁₀ nonattainment areas.



1.5 Overview of local demographic and land-use data

Many of the emissions estimates generated in this report were calculated using demographic and land-use data provided by the Maricopa Association of Governments (MAG). These data were used to apportion and/or scale Maricopa County emissions estimates to the nonattainment area and vice versa. (For example, county-level emissions from residential natural gas usage in Maricopa County were apportioned to the nonattainment area using the ratio of total population in each area). Detailed explanations of how emission estimates were apportioned or scaled are presented in each of the following chapters, along with the data sources used.

1.5.1 Demographic profile

The demographic data provided by MAG included population, employment data, and single family/multi-family splits for calendar year 2004 (2005 data not yet available), for Maricopa County and the nonattainment area. Table 1.5–1 provides an overview of the demographic data used in this report.

Table 1.5–1. Demographic profile of Maricopa County and the PM₁₀ nonattainment area.

Demographic variable	Maricopa County	Within PM₁₀ NAA	Percent within PM₁₀ NAA
Total resident population	3,524,175	3,529,764	100.16%
Total non-resident population	256,205	279,937	109.26%
Total population:	3,780,380	3,809,701	100.78%
Retail employment	437,333	435,390	99.56%
Office employment	359,824	360,309	100.13%
Industrial employment	352,827	350,412	99.32%
Public employment	216,598	209,768	96.85%
Other employment	151,751	151,618	99.91%
Construction	53,774	53,432	99.36%
Work at Home	57,682	57,216	99.19%
Total employment:	1,629,789	1,618,145	99.29%
Single Family/Multi-Family Household Split:			
Single Family	75%		74%
Multi-Family	25%		26%

1.5.2 Land-use data

The most recent land-use data available from MAG was for the year 2004. The 2004 land-use data was assumed to be representative of 2005. Table 1.5–2 presents a summary of the land-use categories and acreage used to develop emission estimates for this inventory.

Table 1.5–2. Land-use categories used to apportion emissions.

Description	Acreage in Maricopa County	Acreage within PM₁₀ NAA	Percent within PM₁₀ NAA
General/active open space (e.g., parks)	148,352	141,334	95.27%
Passive open space (e.g., mountain preserves)	1,748,816	377,814	21.60%
Golf courses	28,215	28,228	100.05%
Lakes	12,525	9,510	75.93%
Agriculture	465,833	223,627	48.01%
Vacant (e.g., developable land)	2,039,335	404,214	19.82%

1.6 Emissions overview by source category

1.6.1 Point sources

The point source category includes those stationary sources that emit a significant amount of pollution into the air such as power plants, industrial processes and large manufacturing facilities. As Maricopa County has an established annual reporting program for sources with air quality permits, the thresholds for defining a point source are lower than the minimums required by the US EPA. For the purposes of this inventory, a point source is a stationary operation within Maricopa County which in 2005 emitted:

- 25 English (short) tons or more of carbon monoxide (CO); or
- 10 tons or more of volatile organic compounds (VOC), oxides of nitrogen (NO_x), or sulfur oxides (SO_x); or
- 5 tons or more of particulate matter less than 10 microns (PM₁₀) or ammonia compounds (NH_x).

Tables 1.6–1 and 1.6–2 summarize annual and typical daily emissions from point sources in Maricopa County and the PM₁₀ nonattainment area, respectively. A detailed breakdown of emissions calculations for all point sources is contained in Chapter 2.

Table 1.6–1. Summary of annual and typical daily emissions from point sources in Maricopa County.

Source Category	Annual (tons/yr)					Typical day (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Electricity generation	313.86	313.20	1,914.79	51.58	198.06	1,887.5	1,883.5	11,016.1	318.7	1,107.5
Comm./inst. fuel combustion	4.90	4.88	58.20	2.82	2.53	28.7	28.6	358.1	17.1	14.0
Industrial fuel combustion	79.10	78.84	739.13	50.59	55.13	483.0	481.2	4,760.2	352.6	317.0
Food/agriculture	64.21	18.08				380.1	109.3			
Industrial processes	842.61	556.08	116.20	123.40	18.11	5,559.3	3,422.7	797.4	793.6	101.2
Manufacturing processes	9.17	8.95	15.00	0.02	0.16	69.2	67.0	82.4	0.1	1.0
Industrial road travel	729.71	294.90				4,945.5	2,035.9			
Waste disposal	69.62	59.45	27.55	56.53		397.6	330.3	151.4	310.6	
Emission reduction credits	1.80		9.80	0.16		9.9		53.7	0.9	
All Point Sources	2,114.97	1,334.38	2,880.67	285.10	273.99	13,760.7	8,358.4	17,219.3	1,793.6	1,540.6

Table 1.6–2. Summary of annual and typical daily emissions from point sources in the PM₁₀ NAA.

Source Category	Annual (tons/yr)					Typical day (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Electricity generation	113.97	113.72	1,154.60	15.24	132.55	637.8	636.3	6,402.8	103.0	728.3
Comm./inst. fuel combustion	4.90	4.88	58.20	2.82	2.53	28.7	28.6	358.1	17.1	14.0
Industrial fuel combustion	40.67	40.53	614.09	46.35	28.75	267.3	266.2	4,009.2	325.4	171.8
Food/agriculture	27.83	7.87				172.3	50.7			
Industrial processes	670.39	420.49	116.20	123.40	12.41	4,585.5	2,932.0	797.4	793.6	69.9
Manufacturing processes	9.17	8.95	15.00	0.02	0.16	69.2	67.0	82.4	0.1	1.0
Industrial road travel	697.98	283.10				4,729.2	1,955.7			
Waste disposal	69.62	59.45	27.55	56.53		397.6	330.3	151.4	310.6	
Emission reduction credits	1.80		9.80	0.16		9.9		53.7	0.9	
All Point Sources	1,636.33	938.98	1,995.44	244.52	176.40	10,897.6	6,266.8	11,854.9	1,550.7	984.9

1.6.2 Area sources

Area sources are facilities or activities whose individual emissions do not qualify them as point sources. Area sources represent numerous facilities or activities that individually release small amounts of a given pollutant, but collectively they can release significant amounts of a pollutant. Stationary sources with annual emissions lower than the point source thresholds described in Section 1.6.1 were included in the area source inventory. Examples of area source categories include residential wood burning, commercial cooking, waste incineration and wildfires.

Tables 1.6–3 and 1.6–4 summarize annual and season-day emissions of the chief area source categories, for Maricopa County and the PM₁₀ nonattainment area, respectively. A detailed breakdown of emissions calculations for each area source category is contained in Chapter 3.

Table 1.6–3. Summary of annual and typical daily emissions from area sources in Maricopa County.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Fuel combustion	694.01	677.85	6,801.33	435.23	27.55	5,968.4	5,754.4	43,000.7	2,805.4	176.6
Industrial processes	36,882.71	5,713.02	564.11	147.06	1,699.43	237,157.6	36,770.8	5,432.2	1,469.1	10,896.6
Waste treatment/disposal	142.64	108.81	28.35	6.14	1,310.85	1,198.1	945.1	227.4	34.0	7,182.7
Misc. area sources	136,892.15	67,831.62	15,659.58	4,291.61	17,026.53	856,409.2	449,431.2	105,201.4	28,831.5	97,343.4
All area sources:	174,611.51	74,331.30	23,053.36	4,880.05	20,064.35	1,100,733.4	492,901.5	153,861.8	33,140.0	115,599.4

Table 1.6–4. Summary of annual and typical daily emissions from area sources in the PM₁₀ NAA.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Fuel combustion	691.70	675.51	6,760.83	432.30	27.36	5,954.3	5,739.9	42,706.4	2,786.5	175.1
Industrial processes	35,266.82	5,555.90	563.60	147.05	1,687.89	226,765.3	35,741.7	5,428.5	1,469.1	10,822.7
Waste treatment/disposal	110.74	76.90	19.70	6.14	1,321.01	890.8	637.8	144.4	34.0	7,238.4
Misc. area sources	21,021.78	6,133.71	1,091.78	297.30	10,784.63	129,190.0	39,905.6	7,337.7	1,998.5	59,370.9
All area sources:	57,091.05	12,442.02	8,435.92	882.80	13,820.89	362,800.5	82,025.0	55,616.9	6,288.1	77,607.1

1.6.3 Nonroad mobile sources

Nonroad mobile sources include off-highway vehicles and engines that move or are moved within a 12-month period. Tables 1.6–5 and 1.6–6 summarize annual and season-day emissions from nonroad mobile sources, for Maricopa County and the PM₁₀ nonattainment area, respectively. A detailed breakdown of emissions calculations for each source category is contained in Chapter 4.

Table 1.6–5. Annual and typical daily emissions from nonroad mobile sources in Maricopa County.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Agricultural	39.21	38.03	386.34	5.95	0.73	251.4	243.8	2,476.5	38.2	4.7
Airport ground support	16.50	15.70	467.82	14.71		90.4	86.0	2,563.4	80.6	
Commercial	119.34	114.47	1,449.72	17.32	23.18	765.0	733.8	9,293.1	111.0	148.6
Construction and mining	1,354.26	1,311.26	16,016.62	287.07	31.22	8,681.1	8,405.5	102,670.7	1,840.2	200.1
Industrial	110.02	107.01	3,316.67	26.63	79.21	705.2	686.0	21,260.7	170.7	507.7
Lawn and garden	178.22	165.18	843.10	9.53	21.21	1,226.0	1,135.4	5,882.8	64.1	155.5
Pleasure craft	11.33	10.45	70.58	0.71	1.49	152.5	140.7	950.0	9.5	20.1
Railway maintenance	1.20	1.16	9.27	0.14	0.02	8.3	8.1	64.2	1.0	0.1
Recreational equipment	42.29	38.95	59.99	0.68	1.97	361.4	332.9	512.7	5.8	16.8
Aircraft	173.48	125.05	3,029.37	233.60		950.6	685.2	16,599.3	1,280.0	
Locomotives	74.45	65.28	2,955.24	173.18	4.57	407.9	357.7	16,193.1	948.9	25.0
All nonroad mobile sources:	2,120.29	1,992.56	28,604.72	769.51	163.58	13,599.9	12,815.2	178,466.6	4,550.0	1,078.7

Table 1.6–6. Annual and typical daily emissions from all nonroad mobile sources in the PM₁₀ NAA.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Agricultural	18.83	18.26	185.46	2.86	0.35	120.7	117.0	1,188.9	18.3	2.2
Airport ground support	16.50	15.70	467.82	14.71		90.4	86.0	2,563.4	80.6	
Commercial	118.48	113.65	1,439.36	17.20	23.01	759.5	728.5	9,226.7	110.2	147.5
Construction and mining	1,356.40	1,313.34	16,042.02	287.52	31.27	8,694.9	8,418.8	102,833.5	1,843.1	200.4
Industrial	109.23	106.25	3,292.98	26.44	78.64	700.2	681.1	21,108.8	169.5	504.1
Lawn and garden	178.50	165.44	844.44	9.54	21.24	1,227.9	1,137.2	5,892.2	64.2	155.8
Pleasure craft	8.60	7.94	53.59	0.54	1.13	115.8	106.9	721.4	7.2	15.2
Railway maintenance	1.20	1.17	9.29	0.14	0.02	8.3	8.1	64.3	1.0	0.1
Recreational equipment	8.89	8.19	12.61	0.14	0.41	76.0	70.0	107.8	1.2	3.5
Aircraft	157.68	114.15	2,929.27	225.69		864.0	625.5	16,050.8	1,236.7	
Locomotives	38.01	33.70	1,509.67	85.72	2.26	208.2	184.7	8,272.2	469.7	12.4
All nonroad mobile sources:	2,012.32	1,897.78	26,786.52	670.50	158.33	12,866.0	12,163.8	168,029.9	4,001.8	1,041.4

1.6.4 Onroad mobile sources

Emissions from onroad mobile sources were calculated for the PM₁₀ nonattainment area located primarily within Maricopa County, as well as for Maricopa County as a whole. A detailed breakdown of emissions calculations for each area source category is contained in Chapter 5.

Tables 1.6–7 and 1.6–8 summarize annual and typical daily emissions from onroad mobile sources in Maricopa County and the PM₁₀ nonattainment area, respectively.

Table 1.6–7. Annual and typical daily emissions from all onroad mobile sources in Maricopa County.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Exhaust	1,092.00	1,007.00	66,187.00	1,611.00	3,011.00	5,982.0	5,516.0	362,669.0	8,827.0	16,496.0
Paved road fugitive dust	320.00	80.00				1,755.0	439.0			
Unpaved road fugitive dust	413.00	175.00				2,264.0	960.0			
Tire wear	14,619.00	200.00				80,104.0	1,098.0			
Brake wear	8,903.00	890.00				48,781.0	4,879.0			
All onroad mobile sources:	25,347.00	2,352.00	66,187.00	1,611.00	3,011.00	138,886.0	12,892.0	362,669.0	8,827.0	16,496.0

Table 1.6–8. Annual and typical daily emissions from all onroad mobile sources in the PM₁₀ NAA.

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Exhaust	1,041.00	960.00	63,093.00	1,536.00	2,870.00	5,702.0	5,258.0	345,713.0	8,415.0	15,725.0
Paved road fugitive dust	305.00	76.00				1,673.0	418.0			
Unpaved road fugitive dust	394.00	167.00				2,158.0	915.0			
Tire wear	13,783.00	189.00				75,523.0	1,034.0			
Brake wear	8,490.00	849.00				46,519.0	4,652.0			
All onroad mobile sources:	24,013.00	2,241.00	63,093.00	1,536.00	2,870.00	131,575.0	12,277.0	345,713.0	8,415.0	15,725.0

1.6.5 Biogenic sources

The biogenic source category includes emissions from all vegetation (e.g., crops, indigenous vegetation, landscaping, etc.) in Maricopa County and the PM₁₀ nonattainment area. Emissions were estimated through MEGAN, a computer model developed by the ENVIRON corporation through a contract with the Maricopa Association of Governments (MAG). Annual and daily NO_x emissions from biogenic sources are shown in Table 1.6–9 for Maricopa County and the PM₁₀ nonattainment area.

Table 1.6–9. Annual and season-day NO_x emissions from biogenic sources.

Geographic area	Annual emissions (tons/yr)	Typical daily emissions (lbs/day)
Maricopa County	3,321.00	18,197.0
PM ₁₀ NAA	1,048.00	5,745.0

1.6.6 All sources

Tables 1.6–10 and 1.6–11 provide summary totals of annual and typical daily emissions from all emission sources in Maricopa County and the PM₁₀ nonattainment area, respectively.

Table 1.6–10. Annual and typical daily emissions from all sources in Maricopa County.

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Point Sources	2,114.97	1,334.38	2,880.67	285.10	273.99	13,760.7	8,358.4	17,219.3	1,793.6	1,540.6
Area Sources:										
<i>Fuel combustion</i>										
Industrial natural gas	16.51	16.51	308.43	1.30	6.81	105.9	105.9	1,977.1	8.3	43.7
Industrial fuel oil	247.82	247.82	3,443.60	329.29	14.18	1,588.6	1,588.6	22,074.4	2,110.8	90.9
Comm./ind. natural gas	60.15	60.15	1,146.39	4.72	3.79	385.6	385.6	7,348.6	30.3	24.3
Comm./ind. fuel oil	76.06	76.06	1,110.79	92.05	2.76	487.6	487.6	7,120.5	590.1	17.7
Residential natural gas	62.59	62.59	774.12	4.94		342.9	342.9	4,241.7	27.1	
Residential wood	230.85	214.69	17.35	2.67		3,057.6	2,843.6	229.8	35.3	
Residential fuel oil	0.01	0.01	0.66	0.26		0.2	0.2	8.7	3.4	
All combustion	694.01	677.85	6,801.33	435.23	27.55	5,968.4	5,754.4	43,000.7	2,805.4	176.6
<i>Industrial Processes</i>										
Chemical manufacturing	76.77	38.85	0.39	0.21	0.34	590.5	298.9	3.0	1.6	2.6
Food products										
Commercial cooking	1,527.98	1,416.96				8,395.5	7,785.5			
Grain handling	12.64	2.68				94.7	20.5			
Ammonia storage					1,695.98					10,871.7
Secondary metal prod.	10.95	9.27	4.53	0.05	1.34	79.0	66.3	25.0	0.4	10.3
Mineral processes (concrete batch, etc.)	431.60	222.71				3,030.4	1,517.2			
Mining & quarry (sand & gravel)	62.97	17.38				409.1	112.1			
Wood products	213.23	149.95				1,657.9	1,170.0			
Rubber/plastics mfg.	365.26	236.52				2,809.7	1,819.4			
Fabricated metal mfg.	138.96	119.88				1,579.3	1,404.1			
Residential const.	12,135.60	1,213.56				77,792.3	7,779.2			
Commercial const.	11,491.21	1,149.12				73,661.6	7,366.2			
Road construction	7,307.35	730.73				46,842.0	4,684.2			
Construction – other	2,806.46	280.65				17,990.2	1,799.0			
Electric equip. mfg.	5.24	3.25	0.01	4.59	0.96	40.3	25.0	0.1	35.3	7.4
ADEQ portables	101.70	42.18	554.60	142.20		844.2	389.8	5,377.5	1,431.7	
Unpaved road travel	170.49	65.45				1,138.8	436.2			
Industrial proc. NEC	24.31	13.87	4.58	0.01	0.80	202.0	97.3	26.7	0.0	4.6
All Ind. Processes	36,882.71	5,713.02	564.11	147.06	1,699.43	237,157.6	36,770.8	5,432.2	1,469.1	10,896.6
<i>Waste Treatment/Disp.</i>										
On-site incineration	0.15	0.10	2.54	0.03		1.6	1.1	19.9	0.3	
Open burning	56.15	56.15	15.16			550.9	550.9	148.4		
Landfills	6.79	4.05	6.50	1.11		39.5	23.5	36.3	6.3	
POTWs					1,310.85					7,182.7
Other waste	79.55	48.51	4.15	5.01		606.0	369.6	22.8	27.5	
All Waste Treat/Disp.	142.64	108.81	28.35	6.14	1,310.85	1,198.1	945.1	227.4	34.0	7,182.7
<i>Misc. Area Sources</i>										
Wildfires	70,882.24	60,792.24	15,639.50	4,288.25	3,279.25	475,719.7	408,001.6	104,963.1	28,780.2	22,008.4
Prescribed fires	0.06	0.06	0.05	0.01	0.00	120.0	120.0	93.0	25.5	7.5
Structure fires	22.53	22.53	2.92			123.8	123.8	16.0		
Vehicle fires	26.41	26.41	1.06			144.7	144.7	5.8		
Aircraft engine testing	0.15	0.12	4.61	1.89		1.1	0.9	35.4	14.5	
Tilling	2,913.73	437.06				30,241.4	4,536.2			
Harvesting	145.48	21.82				3,489.9	523.5			
Unpaved agri. roads	2,041.71	204.17				13,087.9	1,308.8			
Cotton ginning	0.08	0.02				0.6	0.2			
Fertilizer application					2,278.14					12,483.0
Livestock	645.27	70.98			10,429.53	3,535.7	388.9			57,148.1
Crematories	0.96	0.64	11.45	1.46		7.4	4.9	88.0	11.3	
Accidental releases	1.03	1.03				5.6	5.6			
Humans					1,039.60					5,696.5
Leaf blowers fugitive	841.66	317.65				4,611.8	1,740.6			
Offroad rec. vehicles fugitive dust	9,994.00	999.00				54,764.0	5,476.0			
Travel on unpaved parking lots	4,888.00	489.00				26,781.0	2,678.0			
Windblown dust	44,488.84	4,448.88				243,774.4	24,377.4			
All Misc. Area Sources	136,892.15	67,831.62	15,659.58	4,291.61	17,026.53	856,409.2	449,431.2	105,201.4	28,831.5	97,343.4
All Area Sources:	174,611.51	74,331.30	23,053.36	4,880.05	20,064.35	1,100,733.4	492,901.5	153,861.8	33,140.0	115,599.4

Table 1.6–10 (continued). Annual and typical daily emissions from all sources in Maricopa County.

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Nonroad Sources:										
Agricultural equipment	39.21	38.03	386.34	5.95	0.73	251.4	243.8	2,476.5	38.2	4.7
Airport GSE	16.50	15.70	467.82	14.71		90.4	86.0	2,563.4	80.6	
Commercial equipment	119.34	114.47	1,449.72	17.32	23.18	765.0	733.8	9,293.1	111.0	148.6
Construction and mining equipment	1,354.26	1,311.26	16,016.62	287.07	31.22	8,681.1	8,405.5	102,670.7	1,840.2	200.1
Industrial equipment	110.02	107.01	3,316.67	26.63	79.21	705.2	686.0	21,260.7	170.7	507.7
Lawn and garden equipment	178.22	165.18	843.10	9.53	21.21	1,226.0	1,135.4	5,882.8	64.1	155.5
Pleasure craft	11.33	10.45	70.58	0.71	1.49	152.5	140.7	950.0	9.5	20.1
Railway maintenance equipment	1.20	1.16	9.27	0.14	0.02	8.3	8.1	64.2	1.0	0.1
Recreational equipment	42.29	38.95	59.99	0.68	1.97	361.4	332.9	512.7	5.8	16.8
Aircraft	173.48	125.05	3,029.37	233.60		950.6	685.2	16,599.3	1,280.0	
Locomotives	74.45	65.28	2,955.24	173.18	4.57	407.9	357.7	16,193.1	948.9	25.0
All Nonroad Sources	2,120.29	1,992.56	28,604.72	769.51	163.58	13,599.9	12,815.2	178,466.6	4,550.0	1,078.7
Onroad Sources:										
Exhaust	1,092.00	1,007.00	66,187.00	1,611.00	3,011.00	5,982.0	5,516.0	362,669.0	8,827.0	16,496.0
Tire wear	320.00	80.00				1,755.0	439.0			
Brake wear	413.00	175.00				2,264.0	960.0			
Paved road fugitive dust	14,619.00	200.00				80,104.0	1,098.0			
Unpaved road fugitive dust	8,903.00	890.00				48,781.0	4,879.0			
All Mobile Sources:	25,347.00	2,352.00	66,187.00	1,611.00	3,011.00	138,886.0	12,892.0	362,669.0	8,827.0	16,496.0
Biogenic Sources:			3,321.00					18,197.0		
TOTAL, All Sources:	204,193.77	80,010.24	124,046.75	7,545.67	23,512.92	1,266,980.1	526,967.1	730,413.7	48,310.6	134,714.6

Table 1.6–11. Annual and typical daily emissions from all sources in the PM₁₀ nonattainment area.

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Point Sources	1,636.33	938.98	1,995.44	244.52	176.40	10,897.6	6,266.8	11,854.9	1,550.7	984.9
Area Sources:										
<i>Fuel combustion</i>										
Industrial natural gas	16.40	16.40	306.33	1.29	6.77	104.7	104.7	1,955.5	8.2	43.2
Industrial fuel oil	246.14	246.14	3,420.18	327.05	14.08	1,577.8	1,577.8	21,924.3	2,096.5	90.3
Comm./ind. natural gas	59.72	59.72	1,138.13	4.69	3.77	381.5	381.5	7,270.0	30.0	24.1
Comm./ind. fuel oil	75.51	75.51	1,102.80	91.39	2.74	484.1	484.1	7,069.2	585.8	17.6
Residential natural gas	62.69	62.69	775.35	4.95		343.5	343.5	4,248.5	27.1	
Residential wood	231.22	215.04	17.38	2.67		3,062.5	2,848.2	230.1	35.4	
Residential fuel oil	0.01	0.01	0.66	0.26		0.2	0.2	8.7	3.4	
All combustion	691.70	675.51	6,760.83	432.30	27.36	5,954.3	5,739.9	42,706.4	2,786.5	175.1
<i>Industrial Processes</i>										
Chemical manufacturing	76.25	38.59	0.38	0.21	0.34	586.5	296.8	3.0	1.6	2.6
Food products										
Commercial cooking	1,539.90	1,428.01				8,461.0	7,846.2			
Grain handling	12.64	2.68				94.7	20.5			
Ammonia storage					1,684.45					10,797.8
Secondary metal prod.	10.95	9.27	4.53	0.05	1.34	79.0	66.3	25.0	0.4	10.3
Mineral processes (concrete batch, etc.)	430.89	222.17				3,024.9	1,513.0			
Mining & quarry (sand & gravel)	54.77	15.52				347.6	98.2			
Wood products	211.78	148.93				1,646.6	1,162.0			
Rubber/plastics mfg.	362.77	234.91				2,790.6	1,807.0			
Fabricated metal mfg.	138.01	119.06				1,568.6	1,394.5			
Residential const.	11,331.99	1,133.20				72,641.0	7,264.1			
Commercial const.	11,085.55	1,108.55				71,061.2	7,106.1			
Road construction	7,236.42	723.64				46,387.3	4,638.7			
Construction – other	2,475.89	247.59				15,871.1	1,587.1			
Electric equip. mfg.	5.24	3.25	0.01	4.59	0.96	40.3	25.0	0.1	35.3	7.4
ADEQ portables	101.70	42.18	554.60	142.20		844.2	389.8	5,377.5	1,431.7	
Unpaved road travel	167.78	64.48				1,118.8	429.0			
Industrial proc. NEC	24.29	13.86	4.08	0.01	0.80	201.9	97.2	22.9	0.0	4.6
All Ind. Processes	35,266.82	5,555.90	563.60	147.05	1,687.89	226,765.3	35,741.7	5,428.5	1,469.1	10,822.7
<i>Waste Treatment/Disp.</i>										
On-site incineration	0.15	0.10	2.54	0.03		1.6	1.1	19.9	0.3	
Open burning	24.24	24.24	6.51			243.6	243.6	65.3		
Landfills	6.79	4.05	6.50	1.11		39.5	23.5	36.3	6.3	
POTWs					1,321.01					7,238.4
Other waste	79.55	48.51	4.15	5.01		606.0	369.6	22.8	27.5	
All Waste Treat/Disp.	110.74	76.90	19.70	6.14	1,321.01	890.8	637.8	144.4	34.0	7,238.4
<i>Misc. Area Sources</i>										
Wildfires	4,860.02	4,168.20	1,072.32	294.02	224.84	32,617.6	27,974.5	7,196.8	1,973.3	1,509.0
Prescribed fires	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0
Structure fires	22.56	22.56	2.92			124.0	124.0	16.1		
Vehicle fires	26.45	26.45	1.06			145.0	145.0	5.8		
Aircraft engine testing	0.15	0.12	4.61	1.89		1.1	0.9	35.4	14.5	
Tilling	1,228.67	184.30				12,797.0	1,919.6			
Harvesting	58.99	8.85				1,420.8	213.1			
Unpaved agri. roads	910.64	91.06				5,837.4	583.7			
Cotton ginning	0.09	0.02				0.7	0.2			
Fertilizer application					1,093.74					5,993.1
Livestock	520.84	57.29			8,418.39	2,853.9	313.9			46,128.1
Crematories	0.91	0.61	10.87	1.39		7.0	4.7	83.6	10.7	
Accidental releases	1.03	1.03				5.6	5.6			
Humans					1,047.67					5,740.6
Leaf blowers fugitive	843.00	318.16				4,619.2	1,743.3			
Offroad rec. vehicles fugitive dust	2,159.00	216.00				11,830.0	1,184.0			
Travel on unpaved parking lots	3,009.00	301.00				16,490.0	1,649.0			
Windblown dust	7,380.43	738.04				40,440.7	4,044.1			
All Misc. Area Sources	21,021.78	6,133.71	1,091.78	297.30	10,784.63	129,190.0	39,905.6	7,337.7	1,998.5	59,370.9
All Area Sources:	57,091.05	12,442.02	8,435.92	882.80	13,820.89	362,800.5	82,025.0	55,616.9	6,288.1	77,607.1

Table 1.6–11 (continued). Annual and typical daily emissions from all sources in the PM₁₀ nonattainment area.

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃	PM ₁₀	PM _{2.5}	NO _x	SO _x	NH ₃
Nonroad Sources:										
Agricultural equipment	18.83	18.26	185.46	2.86	0.35	120.7	117.0	1,188.9	18.3	2.2
Airport GSE	16.50	15.70	467.82	14.71		90.4	86.0	2,563.4	80.6	
Commercial equipment	118.48	113.65	1,439.36	17.20	23.01	759.5	728.5	9,226.7	110.2	147.5
Construction and mining equipment	1,356.40	1,313.34	16,042.02	287.52	31.27	8,694.9	8,418.8	102,833.5	1,843.1	200.4
Industrial equipment	109.23	106.25	3,292.98	26.44	78.64	700.2	681.1	21,108.8	169.5	504.1
Lawn and garden equipment	178.50	165.44	844.44	9.54	21.24	1,227.9	1,137.2	5,892.2	64.2	155.8
Pleasure craft	8.60	7.94	53.59	0.54	1.13	115.8	106.9	721.4	7.2	15.2
Railway maintenance equipment	1.20	1.17	9.29	0.14	0.02	8.3	8.1	64.3	1.0	0.1
Recreational equipment	8.89	8.19	12.61	0.14	0.41	76.0	70.0	107.8	1.2	3.5
Aircraft	157.68	114.15	2,929.27	225.69		864.0	625.5	16,050.8	1,236.7	
Locomotives	38.01	33.70	1,509.67	85.72	2.26	208.2	184.7	8,272.2	469.7	12.4
All Nonroad Sources:	2,012.32	1,897.78	26,786.52	670.50	158.33	12,866.0	12,163.8	168,029.9	4,001.8	1,041.4
Onroad Sources:										
Exhaust	1,041.00	960.00	63,093.00	1,536.00	2,870.00	5,702.0	5,258.0	345,713.0	8,415.0	15,725.0
Tire wear	305.00	76.00				1,673.0	418.0			
Brake wear	394.00	167.00				2,158.0	915.0			
Paved road fugitive dust	13,783.00	189.00				75,523.0	1,034.0			
Unpaved road fugitive dust	8,490.00	849.00				46,519.0	4,652.0			
All Mobile Sources:	24,013.00	2,241.00	63,093.00	1,536.00	2,870.00	131,575.0	12,277.0	345,713.0	8,415.0	15,725.0
Biogenic Sources:										
			1,048.00					5,745.0		
TOTAL, All Sources:	84,752.70	17,519.78	101,358.87	3,333.82	17,025.62	518,139.1	112,732.6	586,959.7	20,255.6	95,358.4

1.7 Response to public review of draft inventory

MCAQD released a draft 2005 PM₁₀ emissions inventory for public review and comment on January 23, 2007. The public review period for the draft inventory ended on March 1, 2007. MCAQD evaluated the comments received on the draft PM₁₀ emissions inventory and prepared written responses to these comments. A full listing of each comment with MCAQD's and other responsible agencies' responses are available in Appendix 1. As a result of these comments, and along with further QA/QC work by MCAQD and partner agencies, the emission estimates in this report have been revised.