

# 1. Introduction

## 1.1 Overview

This 2005 periodic ozone 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 nonattainment for the eight-hour ozone standard.

This inventory includes emission estimates for three ozone precursors: volatile organic compounds (VOCs), carbon monoxide (CO) and nitrogen oxides (NO<sub>x</sub>). VOC is defined by Maricopa County's Rule 100 as "any organic compound, which participates in atmospheric photochemical reactions, except the non-precursor organic compounds". 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 Ozone Emissions Inventory for Maricopa County. Point, area, and nonroad mobile source emission estimates were prepared by MCAQD. The Maricopa Association of Governments (MAG) prepared the emission estimates for onroad mobile and biogenic 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.**

| <b>Chapter</b>         | <b>Author(s)</b>  | <b>QA/QC contact persons</b>  |
|------------------------|---|---|
| Point Sources          | Bob Downing<br>MCAQD (602) 506-6790                                 | Matt Poppen, Eric Raisanen and Dena Konopka<br>MCAQD (602) 506-6790 |
| Area Sources           | Matt Poppen, Eric Raisanen and Dena Konopka<br>MCAQD (602) 506-6790 | Bob Downing<br>MCAQD (602) 506-6790                                 |
| Nonroad Mobile Sources | Matt Poppen and Eric Raisanen<br>MCAQD (602) 506-6790               | Bob Downing and Dena Konopka<br>MCAQD (602) 506-6790                |
| Onroad Mobile Sources  | Taejoo Shin<br>MAG (602) 254-6300                                   | Eric Raisanen<br>MCAQD (602) 506-6790                               |
| Biogenic Sources       | Taejoo Shin<br>MAG (602) 254-6300                                   | Eric Raisanen<br>MCAQD (602) 506-6790                               |

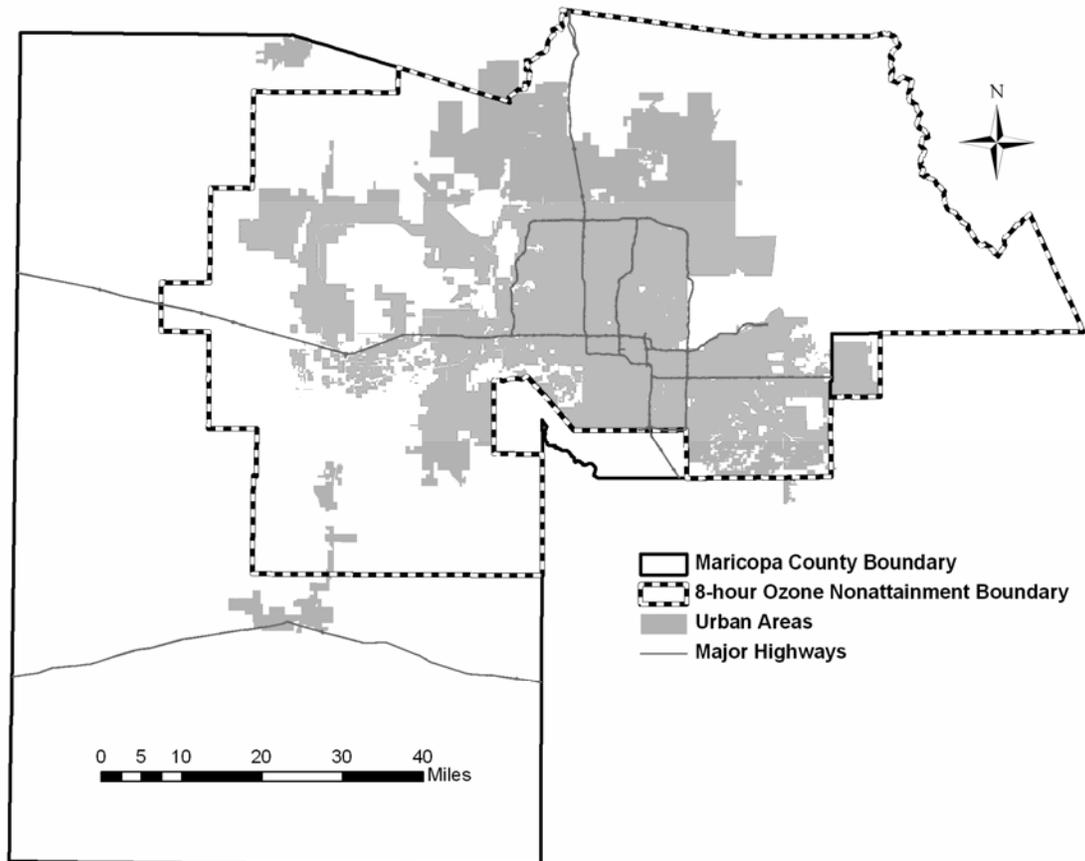
### 1.3 Temporal scope

Annual and ozone season-day emissions were estimated for the year 2005, for Maricopa County and the Maricopa County eight-hour ozone nonattainment area (NAA). The three-month peak ozone season for the Maricopa County nonattainment area has been defined as July 1 through September 30, based on the 1981–1991 pattern of ozone exceedances.

### 1.4 Geographic scope

This inventory includes emission estimates for Maricopa County and for the Maricopa County ozone nonattainment area. Maricopa County encompasses approximately 9,223 square miles of land area, while the Maricopa County eight-hour ozone nonattainment area is approximately 4,880 square miles or about 53 percent of the Maricopa County land area. A portion of the southeastern boundary of the eight-hour ozone nonattainment area includes areas of Pinal County totaling 48 square miles or 0.98% of the nonattainment area. A map of Maricopa County and the nonattainment area is provided in Figure 1.4–1.

Figure 1.4–1. Map of Maricopa County and the eight-hour ozone nonattainment area.



## 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 (as 2005 data were not yet available at the time of writing), for Maricopa County and the nonattainment area. Table 1.5–1 provides an overview of the key demographic data used in this report.

**Table 1.5–1. Demographic profile of Maricopa County and the eight-hour ozone nonattainment area.**

| Demographic variable                               | Maricopa County totals | Within the ozone NAA | Percentage within the ozone NAA |
|--|------------------------|----------------------|---------------------------------|
| Total resident population                          | 3,524,175              | 3,542,478            | 100.52%                         |
| Total non-resident population                      | 256,205                | 279,496              | 109.09%                         |
| <b>Total population:</b>                           | <b>3,780,380</b>       | <b>3,821,974</b>     | <b>101.10%</b>                  |
| Retail employment                                  | 437,333                | 435,945              | 99.68%                          |
| Office employment                                  | 359,824                | 360,295              | 100.13%                         |
| Industrial employment                              | 352,827                | 349,419              | 99.03%                          |
| Public employment                                  | 216,598                | 215,705              | 99.59%                          |
| Other employment                                   | 151,751                | 151,824              | 100.05%                         |
| Construction                                       | 53,774                 | 53,181               | 98.90%                          |
| Work at home                                       | 57,682                 | 57,482               | 99.65%                          |
| <b>Total employment:</b>                           | <b>1,629,789</b>       | <b>1,623,851</b>     | <b>99.64%</b>                   |
| <b>Single-family/multi-family household split:</b> |                        |                      |                                 |
| Single-family                                      | 75%                    | 75%                  |                                 |
| Multi-family                                       | 25%                    | 25%                  |                                 |

### 1.5.2 Land-use data

The most recent land-use data available from MAG was for the year 2004, which 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 the ozone NAA | Percentage within the ozone NAA |
|---|----------------------------|------------------------------|---------------------------------|
| General/active open space (e.g., parks)       | 148,352                    | 141,204                      | 99.90%                          |
| Passive open space (e.g., mountain preserves) | 1,748,816                  | 1,071,509                    | 61.27%                          |
| Golf courses                                  | 28,215                     | 27,730                       | 98.28%                          |
| Lakes   | 12,525                     | 12,525                       | 100.00%                         |
| Agriculture                                   | 465,833                    | 299,870                      | 64.37%                          |
| Vacant (e.g., developable land)               | 2,039,335                  | 883,440                      | 43.32%                          |

## 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, petroleum product storage and transfer facilities, and large industrial 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<sub>x</sub>), or sulfur oxides (SO<sub>x</sub>); or
- 5 tons or more of particulate matter less than 10 microns (PM<sub>10</sub>) or ammonia compounds (NH<sub>x</sub>).

Table 1.6–1 summarizes annual and season-day emissions from point sources (including emission reduction credits) in Maricopa County and the ozone 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 season-day emissions from point sources in Maricopa County and the ozone nonattainment area.**

| Geographic area          | Annual emissions (tons/yr) |                 |          | Season-day emission (lbs/day) |                 |          |
|--------------------------|----------------------------|-----------------|----------|-------------------------------|-----------------|----------|
|                          | VOC                        | NO <sub>x</sub> | CO       | VOC                           | NO <sub>x</sub> | CO       |
| Maricopa County          | 3,889.18                   | 2,880.67        | 1,347.38 | 27,234.5                      | 26,128.8        | 10,569.4 |
| Ozone nonattainment area | 3,866.87                   | 2,502.85        | 1,248.41 | 27,098.8                      | 22,360.0        | 9,669.4  |

### 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 1.6–2 and 1.6–3 summarize annual and season-day emissions of the chief area source categories, for Maricopa County and the ozone nonattainment area, respectively. A detailed breakdown of emissions calculations for each area source category is contained in Chapter 3.

**Table 1.6–2. Summary of annual and season-day emissions from area sources in Maricopa County.**

| Source category            | Annual emissions (tons/yr) |                  |                   | Season-day emission (lbs/day) |                  |                    |
|----------------------------|----------------------------|------------------|-------------------|-------------------------------|------------------|--------------------|
|                            | VOC                        | NO <sub>x</sub>  | CO                | VOC                           | NO <sub>x</sub>  | CO                 |
| Fuel combustion            | 1,981.59                   | 6,801.33         | 3,886.59          | 2,715.4                       | 39,777.1         | 12,054.1           |
| Industrial processes       | 1,221.17                   | 564.11           | 778.32            | 8,865.6                       | 5,431.1          | 4,665.7            |
| Solvent use                | 34,101.52                  |                  |                   | 220,090.2                     |                  |                    |
| Storage/transport          | 2,309.17                   |                  |                   | 13,532.1                      |                  |                    |
| Waste treatment/disposal   | 669.48                     | 28.35            | 346.00            | 5,131.3                       | 161.5            | 1,939.6            |
| Miscellaneous area sources | 34,391.76                  | 15,659.58        | 729,163.13        | 230,690.8                     | 105,095.5        | 4,892,985.9        |
| <b>All area sources:</b>   | <b>74,674.69</b>           | <b>23,053.36</b> | <b>734,174.04</b> | <b>481,025.3</b>              | <b>150,465.3</b> | <b>4,911,645.3</b> |

**Table 1.6–3. Summary of annual and season-day emissions from area sources in the ozone NAA.**

| Source category            | Annual emissions (tons/yr) |                  |                   | Season-day emission (lbs/day) |                  |                    |
|----------------------------|----------------------------|------------------|-------------------|-------------------------------|------------------|--------------------|
|                            | VOC                        | NO <sub>x</sub>  | CO                | VOC                           | NO <sub>x</sub>  | CO                 |
| Fuel combustion            | 1,986.98                   | 6,765.66         | 3,886.63          | 2,698.2                       | 39,536.4         | 11,995.3           |
| Industrial processes       | 1,215.54                   | 564.05           | 784.75            | 8,817.3                       | 5,430.8          | 4,701.0            |
| Solvent use                | 34,264.03                  |                  |                   | 221,748.8                     |                  |                    |
| Storage/transport          | 2,309.17                   |                  |                   | 13,532.1                      |                  |                    |
| Waste treatment/disposal   | 662.81                     | 22.38            | 218.87            | 5,114.3                       | 130.9            | 1,289.8            |
| Miscellaneous area sources | 25,566.88                  | 11,636.15        | 541,619.29        | 222,007.1                     | 101,135.0        | 4,708,372.4        |
| <b>All area sources:</b>   | <b>66,005.41</b>           | <b>18,988.24</b> | <b>546,509.54</b> | <b>473,917.9</b>              | <b>146,233.0</b> | <b>4,726,358.5</b> |

**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 1.6–4 and 1.6–5 summarize annual and season-day emissions from nonroad mobile sources, for Maricopa County and the ozone nonattainment area, respectively. A detailed breakdown of emissions calculations for each source category is contained in Chapter 4.

**Table 1.6–4. Annual and season-day emissions from nonroad mobile sources in Maricopa County.**

| Source category                    | Annual emissions (tons/yr) |                  |                   | Season-day emission (lbs/day) |                  |                    |
|------------------------------------|----------------------------|------------------|-------------------|-------------------------------|------------------|--------------------|
|                                    | VOC                        | NO <sub>x</sub>  | CO                | VOC                           | NO <sub>x</sub>  | CO                 |
| Agricultural                       | 53.31                      | 386.34           | 417.85            | 453.1                         | 3,226.3          | 3,707.9            |
| Airport ground support             | 137.28                     | 467.82           | 5,944.39          | 752.2                         | 2,563.4          | 32,572.0           |
| Commercial                         | 2,339.70                   | 1,449.72         | 54,941.52         | 17,907.0                      | 8,553.8          | 410,503.5          |
| Construction & mining              | 2,690.85                   | 16,016.62        | 23,667.21         | 18,840.1                      | 108,785.6        | 177,261.9          |
| Industrial                         | 772.17                     | 3,316.67         | 13,597.40         | 5,035.6                       | 21,109.0         | 90,844.8           |
| Lawn & garden                      | 6,586.38                   | 843.10           | 101,879.34        | 74,053.0                      | 6,409.9          | 1,085,431.7        |
| Pleasure craft                     | 809.50                     | 70.58            | 1,748.83          | 17,294.9                      | 1,347.2          | 40,149.6           |
| Railway maintenance                | 2.32                       | 9.27             | 28.38             | 16.8                          | 63.9             | 221.4              |
| Recreational                       | 1,416.44                   | 59.99            | 10,675.34         | 16,532.4                      | 535.5            | 135,733.8          |
| Aircraft                           | 1,439.91                   | 3,029.37         | 6,668.71          | 7,911.6                       | 16,644.9         | 36,641.3           |
| Locomotives                        | 116.82                     | 2,955.24         | 295.27            | 640.1                         | 16,193.1         | 1,617.9            |
| <b>All nonroad mobile sources:</b> | <b>16,364.68</b>           | <b>28,604.72</b> | <b>219,864.25</b> | <b>159,436.9</b>              | <b>185,432.6</b> | <b>2,014,685.9</b> |

**Table 1.6–5. Annual and season-day emissions from all nonroad mobile sources in the ozone NAA.**

| Source category                    | Annual emissions (tons/yr) |                  |                   | Season-day emission (lbs/day) |                  |                    |
|------------------------------------|----------------------------|------------------|-------------------|-------------------------------|------------------|--------------------|
|                                    | VOC                        | NO <sub>x</sub>  | CO                | VOC                           | NO <sub>x</sub>  | CO                 |
| Agricultural                       | 34.32                      | 248.69           | 268.97            | 291.7                         | 2,076.8          | 2,386.8            |
| Airport ground support             | 137.28                     | 467.82           | 5,944.39          | 752.2                         | 2,563.4          | 32,572.0           |
| Commercial                         | 2,331.28                   | 1,444.50         | 54,743.73         | 17,842.5                      | 8,523.0          | 409,025.7          |
| Construction & mining              | 2,720.45                   | 16,192.81        | 23,927.55         | 19,047.3                      | 109,982.3        | 179,211.8          |
| Industrial                         | 769.39                     | 3,304.73         | 13,548.45         | 5,017.5                       | 21,033.0         | 90,517.8           |
| Lawn & garden                      | 6,658.83                   | 852.37           | 103,000.01        | 74,867.6                      | 6,480.4          | 1,097,371.4        |
| Pleasure craft                     | 809.50                     | 70.58            | 1,748.83          | 17,294.9                      | 1,347.2          | 40,149.6           |
| Railway maintenance                | 2.35                       | 9.37             | 28.69             | 17.0                          | 64.6             | 223.8              |
| Recreational                       | 911.28                     | 38.59            | 6,868.11          | 10,636.3                      | 344.5            | 87,326.0           |
| Aircraft                           | 1,419.35                   | 2,944.42         | 6,512.18          | 7,798.6                       | 16,178.1         | 35,781.2           |
| Locomotives                        | 79.04                      | 1,933.42         | 193.95            | 433.1                         | 10,594.1         | 1,062.7            |
| <b>All nonroad mobile sources:</b> | <b>15,873.05</b>           | <b>27,507.30</b> | <b>216,784.87</b> | <b>153,998.8</b>              | <b>179,187.3</b> | <b>1,975,628.9</b> |

#### 1.6.4 Onroad mobile sources

Emissions from onroad mobile sources were calculated for the ozone 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 1.6–6 summarizes annual and season-day emissions from onroad mobile sources in Maricopa County and the ozone nonattainment area, respectively.

**Table 1.6–6. Annual and season-day emissions from onroad mobile sources in Maricopa County and the ozone NAA.**

| Geographic area | Annual emissions (tons/yr) |                 |            | Season-day emissions (lbs/day) |                 |             |
|-----------------|----------------------------|-----------------|------------|--------------------------------|-----------------|-------------|
|                 | VOC                        | NO <sub>x</sub> | CO         | VOC                            | NO <sub>x</sub> | CO          |
| Maricopa County | 36,085.90                  | 67,839.00       | 344,454.30 | 186,486.3                      | 366,008.9       | 1,792,310.0 |
| Ozone NAA       | 35,773.10                  | 67,249.70       | 341,465.40 | 184,867.9                      | 363,196.8       | 1,776,755.0 |

#### 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 ozone 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<sub>x</sub> emissions from biogenic sources are shown in Table 1.6–7 for Maricopa County and the ozone nonattainment area.

**Table 1.6–7. Annual and season-day emissions from biogenic sources.**

| Geographic area | Annual emissions (tons/yr) |                 |           | Season-day emissions (lbs/day) |                 |           |
|-----------------|----------------------------|-----------------|-----------|--------------------------------|-----------------|-----------|
|                 | VOC                        | NO <sub>x</sub> | CO        | VOC                            | NO <sub>x</sub> | CO        |
| Maricopa County | 132,535.47                 | 3,320.83        | 19,557.63 | 726,221.8                      | 18,196.4        | 107,165.1 |
| Ozone NAA       | 90,819.25                  | 1,820.27        | 12,345.81 | 497,639.7                      | 9,974.1         | 67,648.3  |

#### 1.6.6 All sources

Tables 1.6–8 and 1.6–9 provide summary totals of annual and season-day emissions from all emission sources in Maricopa County and the ozone nonattainment area, respectively.

**Table 1.6–8. Annual and season-day emissions from all sources in Maricopa County.**

| Source category                     | Annual emissions (tons/yr) |                 |                 | Ozone season-day emissions (lbs/day) |                 |                 |
|-------------------------------------|----------------------------|-----------------|-----------------|--------------------------------------|-----------------|-----------------|
|                                     | VOC                        | NO <sub>x</sub> | CO              | VOC                                  | NO <sub>x</sub> | CO              |
| <b>Point Sources</b>                | <b>3,889.18</b>            | <b>2,880.67</b> | <b>1,347.38</b> | <b>27,234.5</b>                      | <b>26,128.8</b> | <b>10,569.4</b> |
| <b>Area Sources:</b>                |                            |                 |                 |                                      |                 |                 |
| <i><b>Fuel combustion:</b></i>      |                            |                 |                 |                                      |                 |                 |
| Industrial natural gas              | 15.61                      | 308.43          | 192.24          | 83.0                                 | 1,639.6         | 1,022.0         |
| Industrial fuel oil                 | 249.89                     | 3,443.60        | 738.24          | 1,633.1                              | 22,505.1        | 4,824.6         |
| Commercial/inst. natural gas        | 57.78                      | 1,146.39        | 702.66          | 293.7                                | 5,826.5         | 3,571.2         |
| Commercial/inst. fuel oil           | 85.08                      | 1,110.79        | 238.51          | 558.3                                | 7,288.2         | 1,564.9         |
| Residential natural gas             | 45.29                      | 774.12          | 329.41          | 147.3                                | 2,517.8         | 1,071.4         |
| Residential wood                    | 1,527.89                   | 17.35           | 1,685.35        | 0.0                                  | 0.0             | 0.0             |
| Residential fuel oil                | 0.03                       | 0.66            | 0.18            | 0.0                                  | 0.0             | 0.0             |
| <b>All fuel combustion</b>          | <b>1,981.59</b>            | <b>6,801.33</b> | <b>3,886.59</b> | <b>2,715.4</b>                       | <b>39,777.1</b> | <b>12,054.1</b> |
| <i><b>Industrial Processes:</b></i> |                            |                 |                 |                                      |                 |                 |
| Chemical mfg.                       | 44.71                      | 0.39            | 0.03            | 343.9                                | 3.0             | 0.2             |
| Commercial cooking                  | 205.15                     |                 | 585.43          | 1,127.2                              |                 | 3,216.7         |
| Bakeries                            | 87.20                      |                 |                 | 670.7                                |                 |                 |
| Secondary metal production          | 37.36                      | 4.53            | 12.21           | 208.0                                | 24.0            | 64.4            |
| Mineral processes                   | 0.11                       |                 |                 | 0.6                                  |                 |                 |
| Rubber/plastics mfg.                | 681.03                     |                 |                 | 5,238.7                              |                 |                 |
| Electric equipment mfg.             | 87.00                      | 0.01            | 0.17            | 478.0                                | 0.1             | 0.9             |
| State-permitted portable sources    | 55.66                      | 554.60          | 176.52          | 647.4                                | 5,377.5         | 1,357.8         |
| Industrial processes, NEC           | 22.96                      | 4.58            | 3.96            | 151.0                                | 26.5            | 25.7            |
| <b>All Industrial processes</b>     | <b>1,221.17</b>            | <b>564.11</b>   | <b>778.32</b>   | <b>8,865.6</b>                       | <b>5,431.1</b>  | <b>4,665.7</b>  |
| <i><b>Solvent Use:</b></i>          |                            |                 |                 |                                      |                 |                 |
| Architectural coatings              | 10,914.36                  |                 |                 | 79,159.1                             |                 |                 |
| Auto refinishing                    | 3,580.86                   |                 |                 | 27,545.1                             |                 |                 |
| Traffic markings                    | 416.34                     |                 |                 | 4,227.5                              |                 |                 |
| Factory finished (flat)wood         | 190.82                     |                 |                 | 1,405.6                              |                 |                 |
| Wood furniture                      | 892.03                     |                 |                 | 6,870.4                              |                 |                 |
| Aircraft                            | 51.94                      |                 |                 | 378.6                                |                 |                 |
| Misc. surface coating.              | 369.04                     |                 |                 | 2,834.9                              |                 |                 |
| Degreasing                          | 662.35                     |                 |                 | 4,528.7                              |                 |                 |
| Dry cleaning                        | 21.19                      |                 |                 | 162.4                                |                 |                 |
| Graphics arts                       | 208.71                     |                 |                 | 1,477.9                              |                 |                 |
| Misc. industrial solvent use        | 31.81                      |                 |                 | 221.5                                |                 |                 |
| Agricultural pesticide use          | 261.74                     |                 |                 | 818.6                                |                 |                 |
| Consumer/comm. solvent use          | 14,819.09                  |                 |                 | 81,200.5                             |                 |                 |
| Asphalt application                 | 1,681.23                   |                 |                 | 9,259.4                              |                 |                 |
| <b>All solvent use</b>              | <b>34,101.52</b>           |                 |                 | <b>220,090.2</b>                     |                 |                 |
| <i><b>Storage/Transport:</b></i>    |                            |                 |                 |                                      |                 |                 |
| Bulk plants/terminals               | 26.35                      |                 |                 | 138.6                                |                 |                 |
| VOL storage/transport               | 17.10                      |                 |                 | 126.5                                |                 |                 |
| Fuel delivery                       | 317.55                     |                 |                 | 2,050.1                              |                 |                 |
| Trucks in transit                   | 58.81                      |                 |                 | 379.6                                |                 |                 |
| Station losses                      | 784.07                     |                 |                 | 4,338.8                              |                 |                 |
| Vehicle refueling                   | 1,105.30                   |                 |                 | 6,498.6                              |                 |                 |
| <b>All storage/transport</b>        | <b>2,309.17</b>            |                 |                 | <b>13,532.1</b>                      |                 |                 |

**Table 1.6–8 (continued). Annual and season-day emissions from all sources in Maricopa County.**

| Source category                     | Annual emissions (tons/yr) |                   |                     | Ozone season-day emissions (lbs/day) |                   |                     |
|-------------------------------------|----------------------------|-------------------|---------------------|--------------------------------------|-------------------|---------------------|
|                                     | VOC                        | NO <sub>x</sub>   | CO                  | VOC                                  | NO <sub>x</sub>   | CO                  |
| <b>Waste Treatment/Disposal:</b>    |                            |                   |                     |                                      |                   |                     |
| On-site incineration                | 0.07                       | 2.54              | 0.46                | 0.3                                  | 18.0              | 3.4                 |
| Open burning                        | 34.09                      | 15.16             | 322.54              | 191.8                                | 85.2              | 1,809.9             |
| Landfills                           | 6.81                       | 6.50              | 8.42                | 37.0                                 | 35.5              | 46.2                |
| Publicly owned treatment works      | 614.03                     |                   |                     | 4,723.3                              |                   |                     |
| Leaking undergd. storage tanks      | 3.92                       |                   |                     | 120.6                                |                   |                     |
| Other waste disposal                | 10.56                      | 4.15              | 14.57               | 58.2                                 | 22.8              | 80.1                |
| <b>All waste treatment/disposal</b> | <b>669.48</b>              | <b>28.35</b>      | <b>346.00</b>       | <b>5,131.3</b>                       | <b>161.5</b>      | <b>1,939.6</b>      |
| <b>Misc. Area Sources:</b>          |                            |                   |                     |                                      |                   |                     |
| Wildfires                           | 34,305.99                  | 15,639.50         | 729,002.36          | 230,220.1                            | 104,953.3         | 4,892,178.0         |
| Prescribed fires                    | 0.05                       | 0.05              | 0.56                | 0.0                                  | 0.0               | 0.0                 |
| Structure fires                     | 22.94                      | 2.92              | 125.15              | 112.5                                | 14.3              | 613.4               |
| Vehicle fires                       | 8.45                       | 1.06              | 33.02               | 46.3                                 | 5.8               | 180.9               |
| Aircraft engine testing             | 0.48                       | 4.61              | 1.41                | 1.3                                  | 34.1              | 8.7                 |
| Hospitals                           | 53.52                      |                   |                     | 308.2                                |                   |                     |
| Crematories                         | 0.28                       | 11.45             | 0.63                | 2.1                                  | 88.0              | 4.8                 |
| Accidental releases                 | 0.03                       | 0.00              | 0.00                | 0.2                                  | 0.0               | 0.0                 |
| <b>All misc. area sources</b>       | <b>34,391.76</b>           | <b>15,659.58</b>  | <b>729,163.13</b>   | <b>230,690.8</b>                     | <b>105,095.5</b>  | <b>4,892,985.9</b>  |
| <b>All Area Sources:</b>            | <b>74,674.69</b>           | <b>23,053.36</b>  | <b>734,174.04</b>   | <b>481,025.3</b>                     | <b>150,465.3</b>  | <b>4,911,645.3</b>  |
| <b>Nonroad Sources:</b>             |                            |                   |                     |                                      |                   |                     |
| Agricultural equipment              | 53.31                      | 386.34            | 417.85              | 453.1                                | 3,226.3           | 3,707.9             |
| Airport gd. support equip.          | 137.28                     | 467.82            | 5,944.39            | 752.2                                | 2,563.4           | 32,572.0            |
| Commercial equipment                | 2,339.70                   | 1,449.72          | 54,941.52           | 17,907.0                             | 8,553.8           | 410,503.5           |
| Construction & mining equipmt.      | 2,690.85                   | 16,016.62         | 23,667.21           | 18,840.1                             | 108,785.6         | 177,261.9           |
| Industrial equipment                | 772.17                     | 3,316.67          | 13,597.40           | 5,035.6                              | 21,109.0          | 90,844.8            |
| Lawn & garden equipment             | 6,586.38                   | 843.10            | 101,879.34          | 74,053.0                             | 6,409.9           | 1,085,431.7         |
| Pleasure craft                      | 809.50                     | 70.58             | 1,748.83            | 17,294.9                             | 1,347.2           | 40,149.6            |
| Railway maintenance equipment       | 2.32                       | 9.27              | 28.38               | 16.8                                 | 63.9              | 221.4               |
| Recreational equipment              | 1,416.44                   | 59.99             | 10,675.34           | 16,532.4                             | 535.5             | 135,733.8           |
| Aircraft                            | 1,439.91                   | 3,029.37          | 6,668.71            | 7,911.6                              | 16,644.9          | 36,641.3            |
| Locomotives                         | 116.82                     | 2,955.24          | 295.27              | 640.1                                | 16,193.1          | 1,617.9             |
| <b>All Nonroad Sources:</b>         | <b>16,364.68</b>           | <b>28,604.72</b>  | <b>219,864.25</b>   | <b>159,436.9</b>                     | <b>185,432.6</b>  | <b>2,014,685.9</b>  |
| <b>Onroad Sources:</b>              |                            |                   |                     |                                      |                   |                     |
| Exhaust                             | 36,085.90                  | 67,839.00         | 344,454.30          | 186,486.3                            | 366,008.9         | 1,792,310.0         |
| <b>All Mobile Sources:</b>          | <b>52,450.58</b>           | <b>96,443.72</b>  | <b>564,318.55</b>   | <b>345,923.17</b>                    | <b>551,441.49</b> | <b>3,806,995.91</b> |
| <b>Biogenic Sources:</b>            |                            |                   |                     |                                      |                   |                     |
|                                     | 132,535.47                 | 3,320.83          | 19,557.63           | 726,221.8                            | 18,196.4          | 107,165.1           |
| <b>TOTAL, All Sources:</b>          | <b>263,549.91</b>          | <b>125,698.59</b> | <b>1,319,397.60</b> | <b>1,580,404.7</b>                   | <b>746,232.0</b>  | <b>8,836,375.7</b>  |

**Table 1.6–9. Annual and season-day emissions from all sources in the ozone nonattainment area.**

| Source category                     | Annual emissions (tons/yr) |                 |                 | Ozone season-day emissions (lbs/day) |                 |                 |
|-------------------------------------|----------------------------|-----------------|-----------------|--------------------------------------|-----------------|-----------------|
|                                     | VOC                        | NO <sub>x</sub> | CO              | VOC                                  | NO <sub>x</sub> | CO              |
| <b>Point Sources</b>                | <b>3,866.87</b>            | <b>2,502.85</b> | <b>1,248.41</b> | <b>27,098.8</b>                      | <b>22,360.0</b> | <b>9,669.4</b>  |
| <b>Area Sources:</b>                |                            |                 |                 |                                      |                 |                 |
| <i><b>Fuel combustion:</b></i>      |                            |                 |                 |                                      |                 |                 |
| Industrial natural gas              | 15.46                      | 305.44          | 190.37          | 82.2                                 | 1,623.7         | 1,012.0         |
| Industrial fuel oil                 | 247.47                     | 3,410.20        | 731.08          | 1,617.3                              | 22,286.8        | 4,777.8         |
| Commercial/inst. natural gas        | 57.70                      | 1,144.67        | 701.60          | 293.2                                | 5,817.7         | 3,565.9         |
| Commercial/inst. fuel oil           | 84.96                      | 1,109.13        | 238.15          | 557.4                                | 7,277.2         | 1,562.6         |
| Residential natural gas             | 45.53                      | 778.14          | 331.12          | 148.1                                | 2,530.8         | 1,077.0         |
| Residential wood                    | 1,535.84                   | 17.44           | 1,694.12        | 0.0                                  | 0.0             | 0.0             |
| Residential fuel oil                | 0.03                       | 0.66            | 0.18            | 0.0                                  | 0.0             | 0.0             |
| <b>All fuel combustion</b>          | <b>1,986.98</b>            | <b>6,765.66</b> | <b>3,886.63</b> | <b>2,698.2</b>                       | <b>39,536.4</b> | <b>11,995.3</b> |
| <i><b>Industrial Processes:</b></i> |                            |                 |                 |                                      |                 |                 |
| Chemical mfg.                       | 44.28                      | 0.38            | 0.03            | 340.6                                | 2.9             | 0.2             |
| Commercial cooking                  | 207.40                     |                 | 591.87          | 1,139.6                              |                 | 3,252.0         |
| Bakeries                            | 86.35                      |                 |                 | 664.2                                |                 |                 |
| Secondary metal production          | 37.36                      | 4.53            | 12.21           | 208.0                                | 24.0            | 64.4            |
| Mineral processes                   | 0.11                       |                 |                 | 0.6                                  |                 |                 |
| Rubber/plastics mfg.                | 674.42                     |                 |                 | 5,187.8                              |                 |                 |
| Electric equipment mfg.             | 87.00                      | 0.01            | 0.17            | 478.0                                | 0.1             | 0.9             |
| State-permitted portable sources    | 55.66                      | 554.60          | 176.52          | 647.4                                | 5,377.5         | 1,357.8         |
| Industrial processes, NEC           | 22.96                      | 4.53            | 3.95            | 151.0                                | 26.3            | 25.6            |
| <b>All Industrial processes</b>     | <b>1,215.54</b>            | <b>564.05</b>   | <b>784.75</b>   | <b>8,817.3</b>                       | <b>5,430.8</b>  | <b>4,701.0</b>  |
| <i><b>Solvent Use:</b></i>          |                            |                 |                 |                                      |                 |                 |
| Architectural coatings              | 11,034.45                  |                 |                 | 80,030.1                             |                 |                 |
| Auto refinishing                    | 3,620.38                   |                 |                 | 27,849.0                             |                 |                 |
| Traffic markings                    | 420.92                     |                 |                 | 4,273.8                              |                 |                 |
| Factory finished (flat)wood         | 188.97                     |                 |                 | 1,392.0                              |                 |                 |
| Wood furniture                      | 883.38                     |                 |                 | 6,803.8                              |                 |                 |
| Aircraft                            | 51.94                      |                 |                 | 378.6                                |                 |                 |
| Misc. surface coating.              | 365.46                     |                 |                 | 2,807.4                              |                 |                 |
| Degreasing                          | 655.93                     |                 |                 | 4,484.7                              |                 |                 |
| Dry cleaning                        | 21.19                      |                 |                 | 162.4                                |                 |                 |
| Graphics arts                       | 206.69                     |                 |                 | 1,463.5                              |                 |                 |
| Misc. industrial solvent use        | 31.50                      |                 |                 | 219.4                                |                 |                 |
| Agricultural pesticide use          | 69.62                      |                 |                 | 255.3                                |                 |                 |
| Consumer/comm. solvent use          | 14,982.14                  |                 |                 | 82,093.9                             |                 |                 |
| Asphalt application                 | 1,731.47                   |                 |                 | 9,534.9                              |                 |                 |
| <b>All solvent use</b>              | <b>34,264.03</b>           |                 |                 | <b>221,748.8</b>                     |                 |                 |
| <i><b>Storage/Transport:</b></i>    |                            |                 |                 |                                      |                 |                 |
| Bulk plants/terminals               | 26.35                      |                 |                 | 138.6                                |                 |                 |
| VOL storage/transport               | 17.10                      |                 |                 | 126.5                                |                 |                 |
| Fuel delivery                       | 317.55                     |                 |                 | 2,050.1                              |                 |                 |
| Trucks in transit                   | 58.81                      |                 |                 | 379.6                                |                 |                 |
| Station losses                      | 784.07                     |                 |                 | 4,338.8                              |                 |                 |
| Vehicle refueling                   | 1,105.30                   |                 |                 | 6,498.6                              |                 |                 |
| <b>All storage/transport</b>        | <b>2,309.17</b>            |                 |                 | <b>13,532.1</b>                      |                 |                 |

**Table 1.6–9 (continued). Annual and season-day emissions from all sources in the ozone nonattainment area.**

| Source category                     | Annual emissions (tons/yr) |                   |                     | Ozone season-day emissions (lbs/day) |                   |                     |
|-------------------------------------|----------------------------|-------------------|---------------------|--------------------------------------|-------------------|---------------------|
|                                     | VOC                        | NO <sub>x</sub>   | CO                  | VOC                                  | NO <sub>x</sub>   | CO                  |
| <b>Waste Treatment/Disposal:</b>    |                            |                   |                     |                                      |                   |                     |
| On-site incineration                | 0.07                       | 2.54              | 0.46                | 0.3                                  | 18.0              | 3.4                 |
| Open burning                        | 20.66                      | 9.19              | 195.41              | 122.9                                | 54.6              | 1,160.2             |
| Landfills                           | 6.81                       | 6.50              | 8.42                | 37.0                                 | 35.5              | 46.2                |
| Publicly owned treatment works      | 620.78                     |                   |                     | 4,775.3                              |                   |                     |
| Leaking undergd. storage tanks      | 3.92                       |                   |                     | 120.6                                |                   |                     |
| Other waste disposal                | 10.56                      | 4.15              | 14.57               | 58.2                                 | 22.8              | 80.1                |
| <b>All waste treatment/disposal</b> | <b>662.81</b>              | <b>22.38</b>      | <b>218.87</b>       | <b>5,114.3</b>                       | <b>130.9</b>      | <b>1,289.8</b>      |
| <b>Misc. Area Sources:</b>          |                            |                   |                     |                                      |                   |                     |
| Wildfires                           | 25,480.36                  | 11,616.05         | 541,457.70          | 221,532.3                            | 100,992.6         | 4,707,560.5         |
| Prescribed fires                    | 0.05                       | 0.05              | 0.56                | 0.0                                  | 0.0               | 0.0                 |
| Structure fires                     | 23.06                      | 2.94              | 125.80              | 113.0                                | 14.4              | 616.6               |
| Vehicle fires                       | 8.50                       | 1.06              | 33.19               | 46.6                                 | 5.8               | 181.9               |
| Aircraft engine testing             | 0.48                       | 4.61              | 1.41                | 1.3                                  | 34.1              | 8.7                 |
| Hospitals                           | 54.11                      |                   |                     | 311.6                                |                   |                     |
| Crematories                         | 0.28                       | 11.45             | 0.63                | 2.1                                  | 88.0              | 4.8                 |
| Accidental releases                 | 0.03                       | 0.00              | 0.00                | 0.2                                  | 0.0               | 0.0                 |
| <b>All misc. area sources</b>       | <b>25,566.88</b>           | <b>11,636.15</b>  | <b>541,619.29</b>   | <b>222,007.1</b>                     | <b>101,135.0</b>  | <b>4,708,372.4</b>  |
| <b>All Area Sources:</b>            | <b>66,005.41</b>           | <b>18,988.24</b>  | <b>546,509.54</b>   | <b>473,917.9</b>                     | <b>146,233.0</b>  | <b>4,726,358.5</b>  |
| <b>Nonroad Sources:</b>             |                            |                   |                     |                                      |                   |                     |
| Agricultural equipment              | 34.32                      | 248.69            | 268.97              | 291.7                                | 2,076.8           | 2,386.8             |
| Airport gd. support equip.          | 137.28                     | 467.82            | 5,944.39            | 752.2                                | 2,563.4           | 32,572.0            |
| Commercial equipment                | 2,331.28                   | 1,444.50          | 54,743.73           | 17,842.5                             | 8,523.0           | 409,025.7           |
| Construction & mining equipmt.      | 2,720.45                   | 16,192.81         | 23,927.55           | 19,047.3                             | 109,982.3         | 179,211.8           |
| Industrial equipment                | 769.39                     | 3,304.73          | 13,548.45           | 5,017.5                              | 21,033.0          | 90,517.8            |
| Lawn & garden equipment             | 6,658.83                   | 852.37            | 103,000.01          | 74,867.6                             | 6,480.4           | 1,097,371.4         |
| Pleasure craft                      | 809.50                     | 70.58             | 1,748.83            | 17,294.9                             | 1,347.2           | 40,149.6            |
| Railway maintenance equipment       | 2.35                       | 9.37              | 28.69               | 17.0                                 | 64.6              | 223.8               |
| Recreational equipment              | 911.28                     | 38.59             | 6,868.11            | 10,636.3                             | 344.5             | 87,326.0            |
| Aircraft                            | 1,419.35                   | 2,944.42          | 6,512.18            | 7,798.6                              | 16,178.1          | 35,781.2            |
| Locomotives                         | 79.04                      | 1,933.42          | 193.95              | 433.1                                | 10,594.1          | 1,062.7             |
| <b>All Nonroad Sources:</b>         | <b>15,873.05</b>           | <b>27,507.30</b>  | <b>216,784.87</b>   | <b>153,998.8</b>                     | <b>179,187.3</b>  | <b>1,975,628.9</b>  |
| <b>Onroad Sources:</b>              |                            |                   |                     |                                      |                   |                     |
| Exhaust                             | 35,773.10                  | 67,249.70         | 341,465.40          | 184,867.9                            | 363,196.8         | 1,776,755.0         |
| <b>All Mobile Sources:</b>          | <b>51,646.15</b>           | <b>94,757.00</b>  | <b>558,250.27</b>   | <b>338,866.68</b>                    | <b>542,384.15</b> | <b>3,752,383.89</b> |
| <b>Biogenic Sources:</b>            | <b>90,819.25</b>           | <b>1,820.27</b>   | <b>12,345.81</b>    | <b>497,639.7</b>                     | <b>9,974.1</b>    | <b>67,648.3</b>     |
| <b>TOTAL, All Sources:</b>          | <b>212,337.68</b>          | <b>118,068.36</b> | <b>1,118,354.03</b> | <b>1,337,523.0</b>                   | <b>720,951.3</b>  | <b>8,556,060.0</b>  |