

2002 Periodic Emissions Inventory for PM₁₀ for the Maricopa County, Arizona Nonattainment Area

ERRATA

NOTE: All of the corrections described below have been incorporated into a revised electronic version of the 2002 PM₁₀ Periodic Emission Inventory, available at: <http://www.maricopa.gov/aq/ei/reports.aspx>. (The corrected chapters are indicated by the notation “Rev. 3/06” in the footer of each page). The revised emissions totals have also been submitted to the U.S. EPA, and are reflected in the most recent version (February 2006) of the 2002 National Emissions Inventory (NEI).

Chapter 1: Introduction

page 6: Changes to summary Tables 1.6–5 and 1.6–6 result from a significant change in the method used to estimate PM₁₀ and PM_{2.5} emissions from aircraft (described in more detail below).

pages 8, 10–11: The changes to the method used to estimate PM₁₀ and PM_{2.5} emissions from aircraft (described below) also necessitated changes to Figures 1.6–1 and 1.6–2 (pie charts of annual PM₁₀ and PM_{2.5} emissions, by source category) and Figures 1.6–6 and 1.6–7 (pie charts of typical daily PM₁₀ and PM_{2.5} emissions, respectively).

page 13: The above-mentioned changes in aircraft emissions estimates also produced changes in the comparative bar charts in Figures 1.6–11 and 1.6–12.

page 14: Incorrect emissions data for 1994 were inadvertently incorporated in Table 1.6–10. Also, the above mentioned changes in aircraft emissions estimates necessitated changes to 2002 data in Table 1.6–10.

Chapter 4: Nonroad Mobile Sources

pages 108–111: (Section 4.12, Aircraft): A recent review of the calculation methods used to calculate PM₁₀ and PM_{2.5} emissions from aircraft indicated that the prior approach led to a significant overestimate of these emissions from air carriers.

Three airports in Maricopa County reported air carrier activity in 2002: Phoenix Sky Harbor International Airport, Phoenix Goodyear Airport, and Williams Gateway Airport. The FAA’s Emissions and Dispersion Modeling System model (EDMS, version 4.11) was used to estimate annual and average daily emissions for these airports for a number of pollutants; however, the model does not calculate PM emissions for any aircraft type. Thus, based on earlier EPA guidance, PM₁₀ and PM_{2.5} were estimated by applying ratios of NO_x:PM₁₀ and NO_x:PM_{2.5} derived for air taxis. While this approach was used successfully for calculating PM from the air taxi, general aviation, and military aircraft sectors, its application led to unusually large estimates of PM emissions from air carriers.

More recent guidance¹ recommends instead using the following emission factors:

Pollutant	Emission Factor (tons/LTO per engine)
PM ₁₀	0.0002693
PM _{2.5}	0.0002628

¹ “Commercial Aircraft PM Emission Estimates”. Memorandum from R. Billings and R. Chang (ERG) to L. Driver *et al.* (EPA), Sept 21, 2004. Pp. 26–28 in “General Aircraft References”, available at: ftp://ftp.epa.gov/EmisInventory/draftnei2002/mobile/nonroad/documentation/2_aircraft.pdf

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ERRATA (continued)

Based on information supplied by airports reporting air carrier traffic, an average number of engines was determined. The EPA emission factors for PM₁₀ and PM_{2.5} (tons/LTO per engine), the average number of engines and the number of landing and take-off operations (LTOs) per affected airport were used to calculate a lbs/LTO emission factor.

Airport	Average number of engines	LTOs in 2002	PM₁₀ (lbs/LTO)	PM_{2.5} (lbs/LTO)
Phoenix Sky Harbor International Airport (PHX)	2.38	187,125	1.28	1.25
Phoenix Goodyear Airport (GYR)	2.75	131	1.48	1.45
Williams Gateway Airport (IWA)	2	421	1.08	1.05

Applying this new method greatly reduced estimates of PM₁₀ and PM_{2.5} emissions from air carriers. The corrected calculations are now in line with emissions estimates from similar-sized U.S. airports, as well as EPA-calculated national totals.

The following tables summarize the differences in 2002 annual and average daily aircraft emissions from the combined activity categories, for Maricopa County and the PM₁₀ nonattainment area, respectively.

Summary of emission changes for aircraft (all types):

Maricopa County	Annual emissions (tons/yr)		Typical daily emissions (lbs/day)	
	PM₁₀	PM_{2.5}	PM₁₀	PM_{2.5}
Original Calculations	15,987.67	11,030.94	87,603.7	60,443.5
Revised Calculations	1,719.37	1,220.22	9,421.2	6,686.1
Difference	-14,268.30	-9,810.72	-78,182.5	-53,757.4

PM₁₀ Nonattainment Area	Annual emissions (tons/yr)		Typical daily emissions (lbs/day)	
	PM₁₀	PM_{2.5}	PM₁₀	PM_{2.5}
Original Calculations	15,985.12	11,029.19	87,589.7	60,433.9
Revised Calculations	1,716.82	1,218.47	9,407.2	6,676.6
Difference	-14,268.30	-9,810.72	-78,182.5	-53,757.3

Note that totals shown in tables may not equal the sum of individual values due to independent rounding.

page 109: (First paragraph): “EDMS 4.1” should read “EDMS 4.11”.

page 110: Table 4.12–2 has been revised to reflect the corrected PM₁₀ and PM_{2.5} emission factors for air carriers as described above.

page 111: Table 4.12–3 has been revised to reflect the corrected PM₁₀ and PM_{2.5} annual and daily emissions for air carriers.

pages 113–114: The above-mentioned changes in aircraft emissions estimates also produced changes in summary Tables 4.14–1 and 4.14–2.