

Pinal County, Arizona

Area Redesignation for the 1987 24-hour PM10
National Ambient Air Quality Standard

Technical Support Document

9/21/2010

US Environmental Protection Agency
Region 9

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TECHNICAL SUPPORT DOCUMENT
PINAL COUNTY, ARIZONA
AREA REDESIGNATION FOR THE 1987 24-HOUR PM₁₀ NAAQS

Introduction

Pursuant to section 107(d)(3) of the Clean Air Act (CAA), EPA may notify the governor of any state that available information indicates that the designation of any area should be revised. Based on monitoring data that indicated persistent violations of the 1987 24-hour PM₁₀ national ambient air quality standard (NAAQS), EPA notified the Governor of Arizona and tribal leaders for the Ak-Chin Indian Community (Ak-Chin), the Gila River Indian Community (GRIC), the San Carlos Apache Tribe, and the Tohono O'odham Nation (TON) that it was initiating the process to redesignate to nonattainment those violating areas within Pinal County, and any nearby areas that could be causing or contributing to those violations. EPA requested recommendations for the redesignation by February 11, 2010, consistent with the timelines set out in the CAA.

Under section 107(d)(3)(A) of the CAA, EPA is directed by Congress to evaluate “air quality data, planning and control considerations, or any other air quality-related considerations the Administrator deems appropriate” in its redesignation actions. Because our redesignation involves a nonattainment area (NAA), we are also taking into account CAA section 107(d)(1)(A), which provides that nonattainment areas are to include the geographic area that does not meet, or that contributes to ambient air quality in a nearby area that does not meet the NAAQS for a given pollutant.

This technical analysis for Pinal County identifies the monitors that violate the 24-hour PM₁₀ standard and evaluates surrounding areas for contributions to particulate concentrations in the area. EPA guidance¹ provides for the use of “a qualitative analysis of the area of representativeness of the monitoring station, together with the consideration of terrain, meteorology, and sources of emissions...” in defining area boundaries.

Consistent with that guidance, EPA has evaluated the area based on the weight of evidence of the following factors and other relevant information:

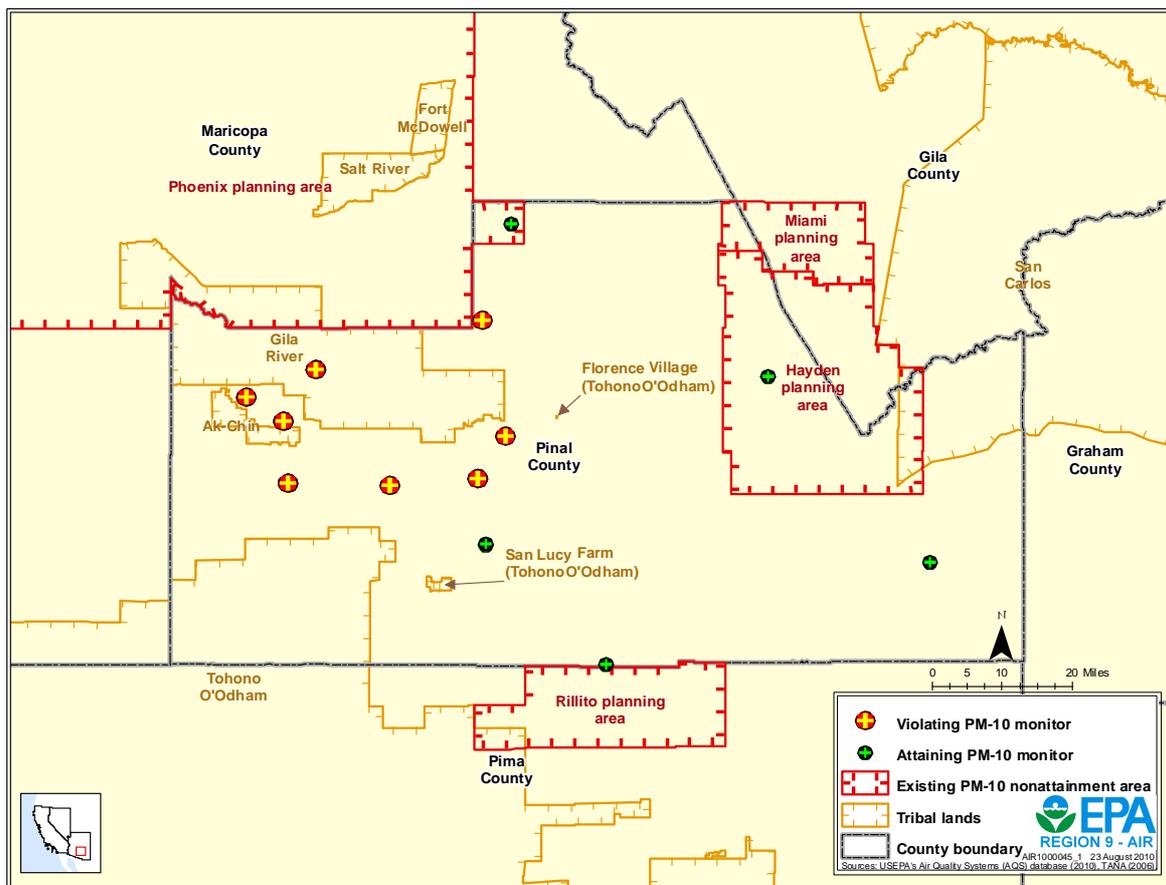
- air quality data
- pollutant emissions
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

¹ PM₁₀ SIP Development Guideline, EPA-450/2-86-001, June 1987.

We also used analytical tools and data such as wind roses, particle composition monitoring data, and the correlation between meteorological data and particle composition data to evaluate the area.

Figure 1 is a map of the area showing relevant information such as the locations of air quality monitors, boundaries for counties and Indian lands, and nearby PM₁₀ nonattainment areas.

Figure 1. Pinal County PM₁₀ Monitors and Nearby Nonattainment Areas



In response to EPA’s request for recommendations, on February 11, 2010, the Tohono O’odham Nation submitted a recommendation for designation as attainment/unclassifiable for TON’s lands. The Gila River Indian Community noted that certain exceedances have been flagged as caused by exceptional events, and declined to submit a recommendation until formal consultation has been conducted. GRIC reaffirmed this request in a letter dated May 27, 2010. The Ak-Chin Tribe made a verbal request for formal consultation and later, in a letter dated September 2, 2010, submitted a recommendation that EPA designate reservation lands as “attainment/unclassifiable.” The San Carlos Apache Tribe did not submit a recommendation. Arizona’s submittal, dated March 26, 2010, recommended that only a portion of central-western Pinal County be redesignated as nonattainment. EPA has taken these recommendations under consideration, and while EPA agrees that a partial county redesignation is appropriate, we find

that the information provided to date does not adequately support the State's recommended boundary. As discussed in more detail below EPA finds that the State's recommended boundary does not include sources of emissions that are likely causing or contributing to violations of the 24-hour PM₁₀ standard. Accordingly, a larger portion of Pinal County is included within EPA's intended nonattainment area boundary. See Figure 2. EPA will consider any additional information that is provided by the State, tribal leaders, and the public in making its final decision on the designation.

As shown in Figure 2, EPA is proposing that the main reservation of the TON, which lies to the south and west of EPA's proposed NAA remain "unclassifiable." EPA believes that the primary contributors to nonattainment in Pinal County, e.g., onroad emissions, agriculture, stationary industrial sources, and concentrated animal feedlot operations either are not present on the TON's main reservation, or are present in relatively small amounts, and population density is very low. See Figures 4 and 7 and Table 5. EPA has concluded that activities occurring there are not contributing to nonattainment of the PM₁₀ standard in Pinal County.

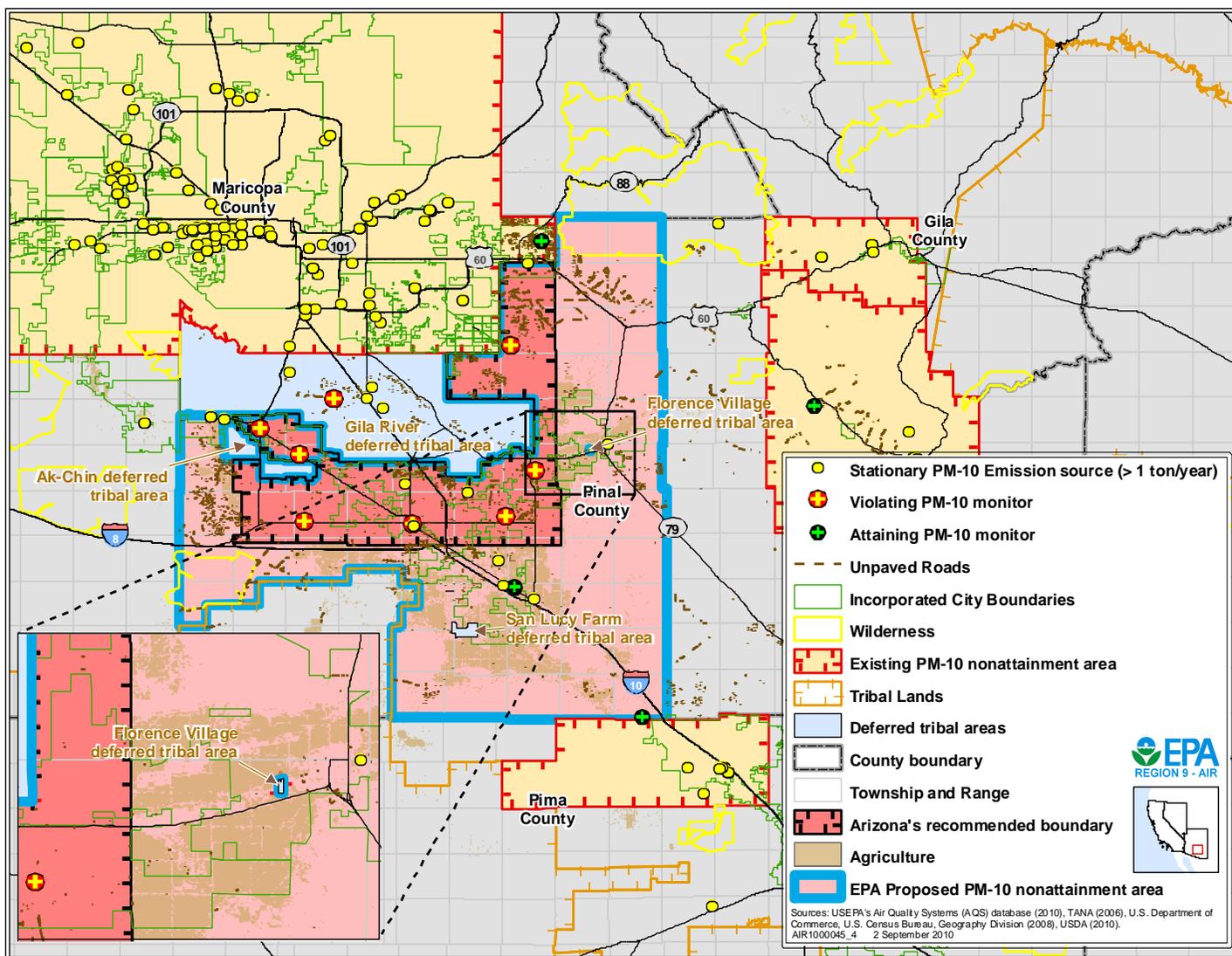
EPA is also proposing to find that the San Carlos Apache lands, which lie to the east of the Hayden and Miami NAAs,² remain "unclassifiable." The population density of the reservation is very low. See Table 5. Additionally, the San Carlos Apache reservation is located about 40 miles east of the proposed nonattainment area and is separated from it by mountainous terrain and existing nonattainment areas.

At this time, EPA is deferring its decision regarding redesignation of the Ak-Chin and GRIC, as well as the TON's Florence Village and San Lucy Farm, pending consideration of issues unique to tribal lands, completion of formal consultation with the tribal governments, and consideration of certain exceptional events flags affecting the GRIC lands.

Under EPA's proposal, the Apache Junction area of Pinal County remains part of the Phoenix PM₁₀ nonattainment area, and the existing Hayden and Miami PM₁₀ nonattainment areas are unchanged. The remainder of the County retains its designation of "unclassifiable" for the 1987 24-hour PM₁₀ NAAQS.

² A narrow strip of the San Carlos Apache Reservation is included within the eastern boundary of the Hayden PM₁₀ nonattainment area, which lies to the east of the proposed nonattainment area. See Figure 12. Its status is not changed by this action.

Figure 2. EPA Proposed Nonattainment Area Boundary



EPA Technical Analysis for Pinal County

Factor 1: Air Quality Data

This factor considers the 24-hour PM₁₀ rate of expected exceedances for air quality monitors in Pinal County and nearby areas based on data for the years 2007-2009, which were certified on April 9, 2010, by Pinal County in accordance with 40 CFR 58.15. The rate of expected exceedances indicates whether a monitor attains the specified air quality standard. The 24-hour PM₁₀ standard is met when the 3-year average of the expected exceedances is equal to or less than one. An “exceedance” of the 24-hour PM₁₀ standard is a daily value that is above 150 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) after rounding to the nearest 10 $\mu\text{g}/\text{m}^3$.

The monitors listed in Table 1 are identified by their air quality system (AQS)³ ID number, which consists of state code, county code, site code, and poc (parameter occurrence code) number (state-county-site-poc). Monitors that have either a POC 1 or POC 2 designation are part of Pinal County’s state or local air monitoring stations (SLAMS) network or GRIC’s tribal monitoring network, which consist of filter-based federal reference method (FRM) monitors that operate on a 1-in-3 or 1-in-6 day sampling schedule. The SLAMS/POC 1 or POC 2 monitors are primarily used for NAAQS comparison. The monitors in Table 1 that have a POC 3 designation are considered special purpose monitors (SPMs). All SPMs in Pinal County are designated federal equivalent methods (FEMS).⁴ Monitors eligible for providing design value data generally include SLAMS at population-oriented locations with a federal reference method (FRM) monitor. All data from SPMs using an FRM are eligible for comparison to the relevant NAAQS, subject to the requirements set out in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236).⁵

The 24-hour PM₁₀ expected exceedances for Pinal County are summarized in Table 1. The third column shows the number of days that are expected to exceed the standard, based on monitored exceedances. Pinal County has flagged a number of exceedances for the years 2007-2009 as “high wind” exceptional events.⁶ Without a more in-depth data analysis, it is difficult to determine which of the flagged days would be considered exceptional events under the Exceptional Events Rule (EER). However, given the overwhelming number of expected exceedances at multiple monitoring stations, even the exclusion of all flagged data would not bring Pinal County into attainment of the 24-hour PM₁₀ standard.

³ AQS is an EPA database of ambient air quality data.

⁴ All PM₁₀ SPMs in Pinal County are R & P TEOM 1400a (A/B) continuous analyzers, EPA designation number EQPM-1090-079, that produce hourly data.

⁵ Quality-assured SPMs are comparable to the NAAQS. 40 CFR 58.20 (c) states that “[a]ll data from a SPM using an FRM, FEM, or ARM which has operated more than 24 months is eligible for comparison to the relevant NAAQS...” subject to certain conditions. All SPM monitors in Pinal County have been operating for more than 24 months, and are otherwise eligible. Thus, data from the monitors are comparable to the 24-hour PM₁₀ NAAQS.

⁶ On March 22, 2007, EPA adopted a final rule, *Treatment of Data Influenced by Exceptional Events* (EER) to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the rule, EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an “exceptional event” caused the exceedances. See 72 FR 13560.

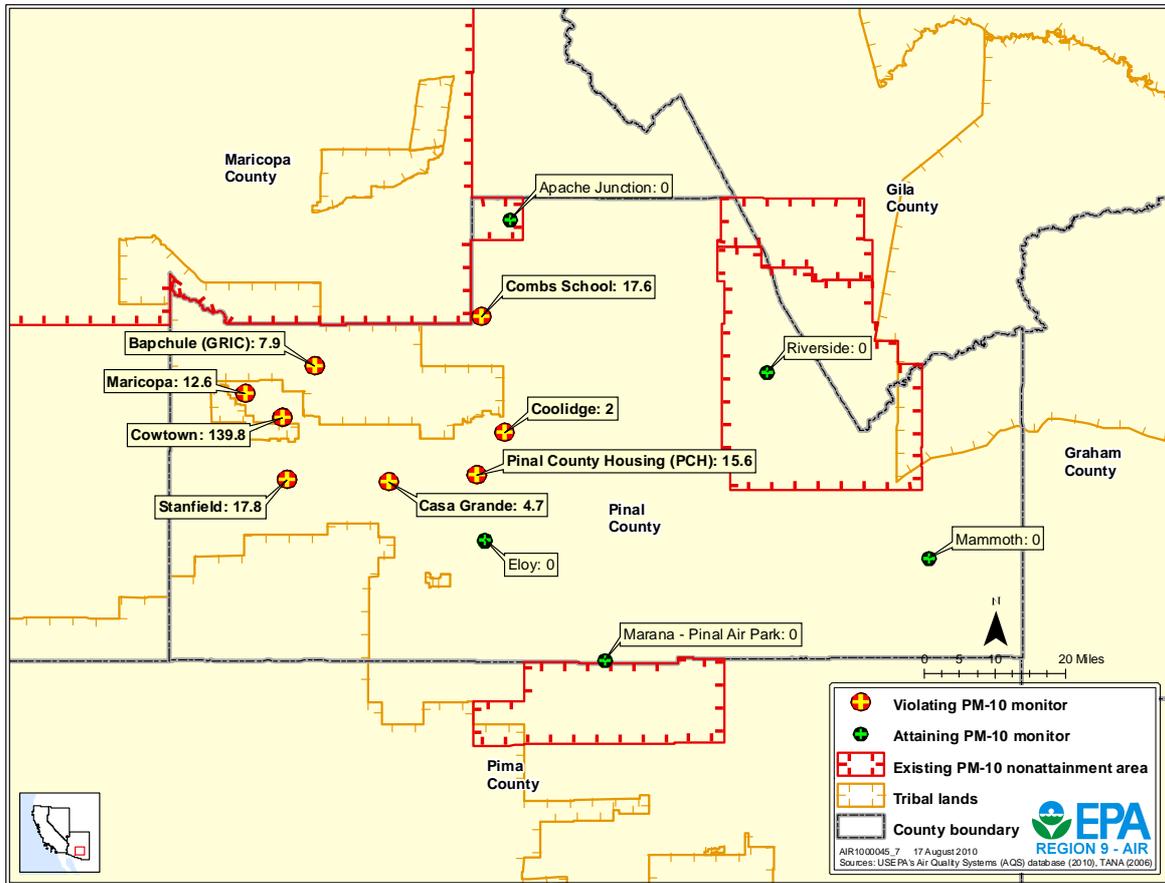
Table 1. Pinal County - PM₁₀ Air Quality Monitoring Data

| Site Name | AQS ID | PM ₁₀ Expected Exceedances 2007-2009 |
|------------------------------|---------------|---|
| Casa Grande | 04-021-0001-1 | 0 |
| | 04-021-0001-3 | 4.7 |
| Apache Junction | 04-021-3002-1 | 0 |
| Coolidge | 04-021-3004-1 | 2 |
| Mammoth | 04-021-3006-1 | 0 |
| Marana (Pinal Air Park) | 04-021-3007-1 | 0 |
| Stanfield | 04-021-3008-1 | 16.4 |
| | 04-021-3008-3 | 17.8 |
| Combs School | 04-021-3009-3 | 17.6 |
| Maricopa | 04-021-3010-3 | 12.6 |
| Pinal County Housing (PCH) | 04-021-3011-1 | 6.5 |
| | 04-021-3011-2 | 5.9 |
| | 04-021-3011-3 | 15.6 |
| Riverside | 04-021-3012-1 | 0 |
| Cowtown | 04-021-3013-1 | 112.9 |
| | 04-021-3013-3 | 139.8 |
| Eloy | 04-021-3014-1 | 0 |
| Bapchule* (GRIC monitors) | 04-021-7004-1 | 6.6 |
| | 04-021-7004-2 | 7.9 |

*EPA is deferring its decisions regarding redesignation of the Ak-Chin and Gila River Indian Community lands, as well as TON's Florence Village and San Lucy Farm, pending consideration of issues unique to tribal lands, completion of formal consultation with the tribal governments, and consideration of exceptional events flags.

Violating monitors are clustered in the central and western portion of Pinal County. See Figures 1 and 3. Monitors located in the southern and eastern portions of the county show attainment with the 24-hour PM₁₀ NAAQS, lending weight to a partial county redesignation.

Figure 3. PM₁₀ Monitors and Expected Exceedances



A summary of the 24-hour PM₁₀ expected exceedances for nearby counties is presented in Table 2.

Table 2. Nearby Counties – PM₁₀ Air Quality Monitoring Data, 2007 – 2009

| County Name | Total Number of PM ₁₀ Monitoring Sites | Number of Sites in Violation of PM ₁₀ NAAQS | Violating Monitor(s) Within Existing PM ₁₀ Non-Attainment Areas (NAAs) |
|-------------|---|--|---|
| Cochise | 2 | 1 | 1: Yes (Paul Spur NAA) |
| Gila | 4 | 1 | 1: Yes (Hayden NAA) |
| Graham | 1 | 0 | N/A |
| Maricopa | 23* | 14 | 13: Yes (Phoenix NAA) 1: No (Buckeye) |
| Pima | 11 | 2 | 1: Yes (Rillito NAA) 1: No (Santa Clara School, Tucson) |

*Includes sites located on both State and Tribal lands

Almost all of the surrounding counties have monitors that violate the PM₁₀ 24-hour standard, with the exception of Graham County, which lies to the east of Pinal. For the most part, these

monitors are included in nonattainment areas previously determined to be partial county designations to account for local conditions and air quality impacts. Given previous determinations regarding the more localized nature of the nonattainment problems in surrounding counties, they most likely do not contribute to exceedances of the PM₁₀ standard within Pinal County and should not be included in the proposed nonattainment area.

Nearby nonattainment areas are shown in Figure 1. A portion of Maricopa County and the Apache Junction area of Pinal County, which is contiguous with the Phoenix urban area, form the Phoenix planning area, a serious PM₁₀ nonattainment area. The Rillito planning area, a moderate PM₁₀ nonattainment area, is located in Pima County, just south of Pinal County. Each area has its own planning process in place to attain the standard. EPA determined in 2006 that the Rillito moderate nonattainment area had attained the PM₁₀ standard.⁷ In 2007, the Rillito monitor measured the only exceedance of the NAAQS since 2000. The exceedance was flagged as caused by an exceptional event, and the State of Arizona submitted a limited maintenance plan and redesignation request to EPA for the Rillito PM₁₀ nonattainment area in June of 2008.

Eastern Pinal County and southern Gila County share portions of two other nonattainment areas: the Hayden moderate PM₁₀ nonattainment area and the Miami moderate PM₁₀ nonattainment area. EPA determined in 2007 that the Miami PM₁₀ area in Gila and Pinal Counties had attained the PM₁₀ standard.⁸ The State of Arizona submitted a limited maintenance plan and redesignation request for the Miami PM₁₀ nonattainment area in July of 2008. Current data indicate the Miami area continues to attain the PM₁₀ standard.

Both Arizona's recommended nonattainment area and EPA's proposed nonattainment area encompass all violating monitors. However, section 107(d)(1)(A) of the Clean Air Act requires that areas that are contributing to ambient air quality must also be included within a nonattainment area. As described in more detail below, EPA believes that Arizona's recommended boundary excludes sources that are contributing to violations measured within the potential nonattainment area. In order to ensure contributing sources are included in the nonattainment area, EPA is proposing a nonattainment area boundary that encompasses more area to the east, south, and west.

Factor 2: Emissions data

For this factor, EPA evaluated emissions data for primary PM₁₀ from the violating area within Pinal County and from potentially contributing nearby areas. "Primary PM₁₀" represents direct emissions of PM₁₀ and includes: "PM₁₀ emissions carbon," "PM₁₀ emissions other," primary sulfate (SO₄), and primary nitrate (NO₃). (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO₂ and nitrogen oxides (NO_x), are part of "PM₁₀ emissions total," they are not shown in Table 3 as separate items). Emissions of SO₂, NO_x, VOCs (volatile organic compounds) and NH₃ (ammonia), which are precursors of secondary PM₁₀, are included for informational purposes in Appendix A but were not considered because the PM₁₀ problem in Pinal County is primarily a fugitive dust problem.

⁷ See 71 FR 44920, August 8, 2006.

⁸ See 72 FR 14422, March 28, 2007.

Table 3 shows total emissions of PM₁₀ as well as individual source categories in Pinal County that emit direct (primary) PM₁₀. The emissions data were derived from the most current version of the national emissions inventory - 2005 National Emissions Inventory, version 2 (NEIv2).⁹

**Table 3. Pinal County Primary PM₁₀ Emissions (2005 NEI version 2)
Includes Filterables + Condensibles***

| Source Category | Emissions (tons per year) | % of Total Primary PM ₁₀ Emissions |
|---|---------------------------|---|
| Nonpoint | | |
| Unpaved Roads | 6,253 | 28% |
| Construction | 5,439 | 25% |
| Agriculture – Crop Tilling & Livestock Dust | 5,008 | 23% |
| Paved Roads | 2,171 | 10% |
| Industrial Process – not elsewhere classified | 955 | 4% |
| Waste Disposal - Open Burning | 906 | 4% |
| Wildfires | 466 | 2% |
| Other Nonpoint | 149 | 1% |
| Nonroad | | |
| Non-Road Equipment – Diesel | 171 | 1% |
| Misc. Nonroad | 106 | 0% |
| Onroad | | |
| On-Road Vehicles – Diesel | 135 | 1% |
| On-Road Vehicles – Gasoline | 85 | 0% |
| Point | | |
| Waste Disposal | 205 | 1% |
| Misc. Point | 39 | 0% |
| TOTAL: | 22,088 | 100% |

* Filterable PM is particles that are directly emitted as a solid or liquid at stack or release conditions and captured on the filter of a stack test train. Condensable PM is material that is in the vapor phase at stack conditions but condenses and/or reacts upon cooling and dilution in the ambient air to form a solid or a liquid particulate immediately after discharge from the stack.

The Arizona Department of Environmental Quality’s (ADEQ’s) boundary recommendation technical support document (TSD) provides a “preliminary” 2007 PM₁₀ emissions inventory. Reproduced below, this emissions inventory identifies significant sources of PM₁₀ emissions in the county as including paved and unpaved road dust, active and fallow agricultural fields, sand and gravel facilities, concentrated animal feeding operations, cattle feedlots, and construction.¹⁰

⁹ <http://www.epa.gov/ttn/chief/net/2005inventory.html#inventorydata> . Retrieved February 3, 2010.

¹⁰ Arizona Air Quality Designations Technical Support Document -Boundary Recommendation for the Pinal County 24-hour PM₁₀ Nonattainment Area; March 15, 2010. Submitted to EPA March 26, 2010.

Table 4. Pinal County Preliminary 2007 PM₁₀ Emissions Inventory

| Source Categories | Emissions (tons per year) | % of Total Primary PM₁₀ Emissions |
|---|--------------------------------------|---|
| Onroad | 42,130 | 83% |
| Tilling, Harvesting, and Agriculture | 2,538 | 5% |
| Stationary Industrial Sources (including sand and gravel facilities) | 2,342 | 5% |
| Concentrated Animal Feeding Operations | 2,045 | 4% |
| Construction Emissions | 1,757 | 3% |
| Portable Industrial Sources | 38 | 0% |
| Off-highway Vehicles | 23 | 0% |
| Total | 50,873 | 100% |

While the NEI and ADEQ emissions inventories disagree in magnitude, there is general agreement in terms of significant sources of PM. These include generally:

- Onroad (including paved and unpaved road) emissions;
- Agriculture (including tilling and harvesting as well as concentrated animal feeding operations and livestock dust);
- Stationary industrial sources, including waste disposal; and
- Construction emissions.

Figures 4 and 5 illustrate the concentration of significant sources of PM₁₀ in the central-western portion of Pinal County, supporting a partial county nonattainment area. Appendix B contains additional maps showing individual source category emissions and locations.

Figure 4. Pinal County Agriculture and Cattle Operations

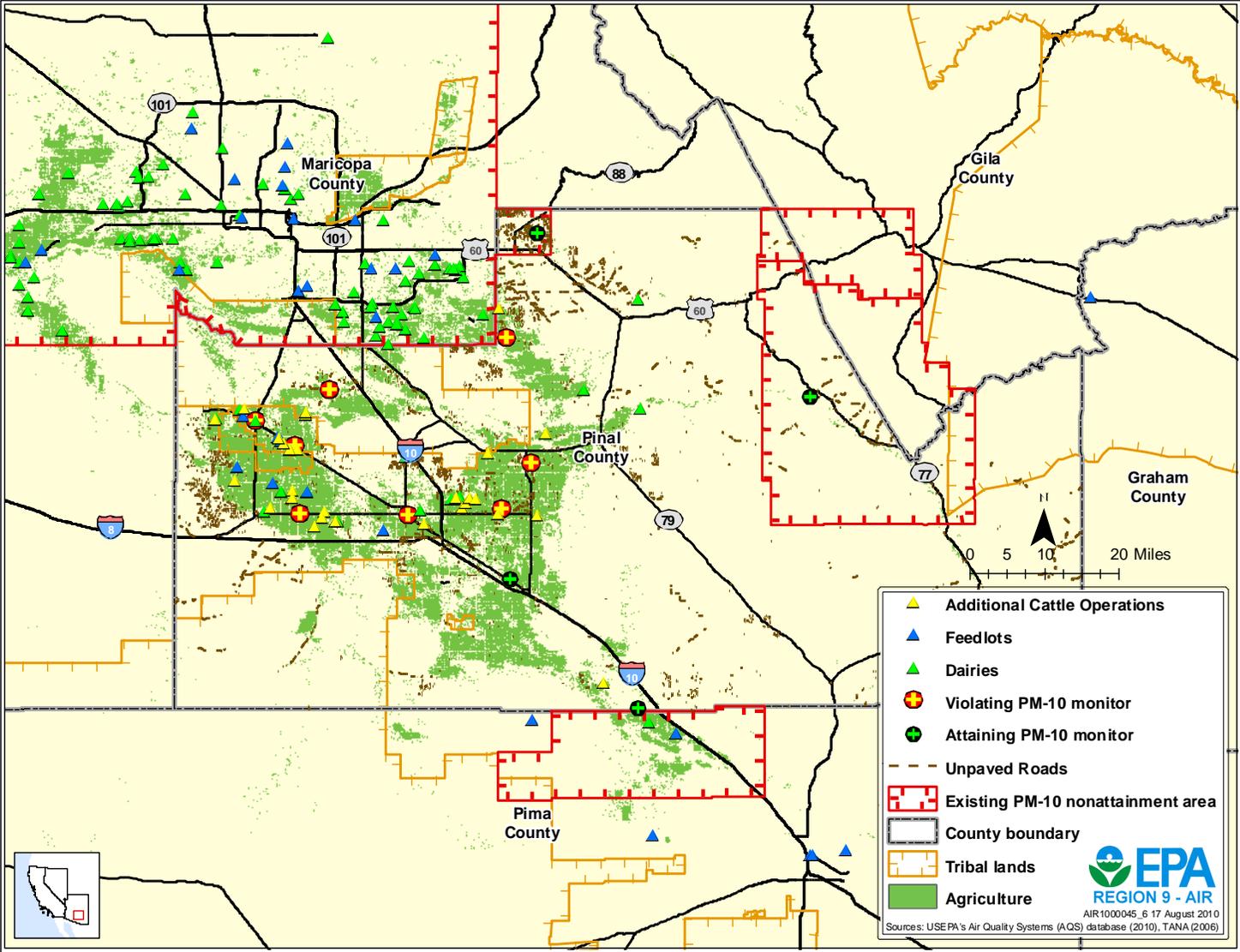
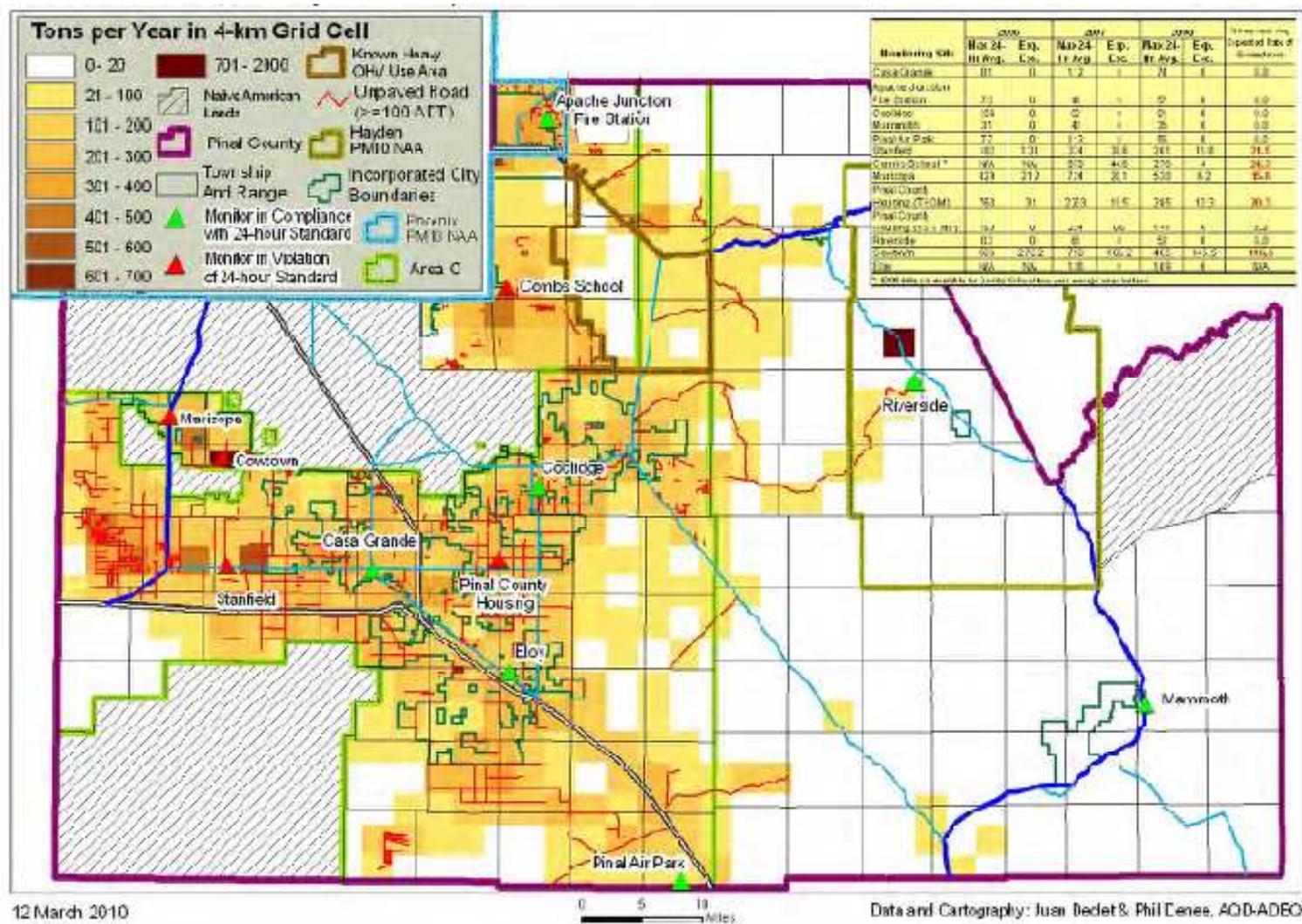


Figure 5. ADEQ Map of Preliminary 2007 Emissions Inventory for Pinal County

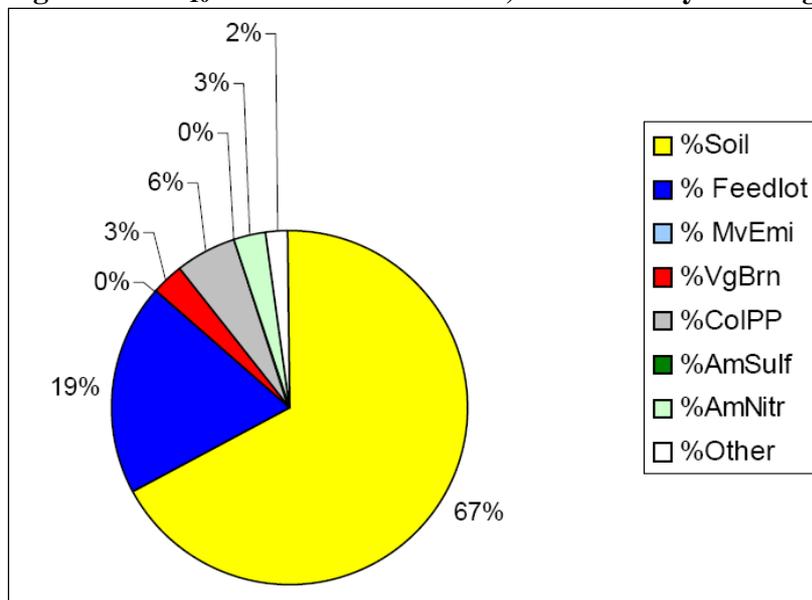


Source: ADEQ Boundary Recommendation for the Pinal County 24-hour PM₁₀ Nonattainment Area, March 15, 2010

Speciation analysis shows that the PM₁₀ in Pinal County contains a significant crustal component. The 2003 Source Apportionment Study, conducted from October to November of 2003, concluded that the dominant PM₁₀ source in Pinal County was soil, with the exception of the Cowtown monitor which was significantly influenced by cattle feedlot emissions.¹¹ For four of the five monitors studied, crustal emissions contributed between 62 and 73% of the total PM₁₀ concentration, while feedlot or other manure sources contributed between 9 and 20%. At the fifth monitor, Cowtown, the feedlot contribution was 59%, with crustal components adding 32%.¹² These findings were reinforced by information gathered in 2009 during an EPA-funded RARE project.¹³

Figure 6 presents the PM₁₀ source contributions for the Pinal County Housing (PCH) monitor.

Figure 6. PM₁₀ Source Contributions, Pinal County Housing (PCH) Monitor.¹⁴



| | | | |
|---------|------------------------------------|--------|------------------------|
| Soil | Geological soil | ColIPP | Coal fired power plant |
| Feedlot | Feedlot soil | AmSulf | Ammonium sulfate |
| MV Emi | Motor vehicle combustion emissions | AmNitr | Ammonium nitrate |
| VgBr | Vegetative burning | Other | Unclassified sources |

These source signatures align with the sources identified in the emissions inventories. Crustal PM₁₀ contributions may be associated with unpaved and paved roads, construction, and some stationary industrial sources (such as sand and gravel facilities). Agriculture (including tilling

¹¹ Pinal County Air Quality Control District Source Apportionment Study: July 29, 2005, page 43.

¹² Pinal County Air Quality Control District Source Apportionment Study: July 29, 2005

¹³ "Chemical Analysis for Source Attribution of Fine and Coarse Particulate Matter in Pinal County, AZ" Andrea L. Clements, Yuling Jia, Matthew P. Fraser, Pierre Herckes, Michael Sundblom, and Paul A. Solomon, presentation to American Aerosol Research Association (AARA) 28th Annual Conference, Minneapolis, Minnesota, October 26 - 30, 2009.

¹⁴ Pinal County Air Quality Control District Source Apportionment Study: July 29, 2005, p. 37.

and harvesting), concentrated animal feeding operations, livestock dust, and stationary industrial sources such as composting facilities may also emit both crustal PM₁₀ and feedlot/manure PM₁₀ emissions. Both emissions inventories and source apportionment studies indicate that these types of sources, which are concentrated in the western portion of the county, are responsible for the elevated PM₁₀ levels in Pinal County.

While EPA finds that the PM₁₀ emissions inventory for Pinal County and ADEQ's corresponding maps are helpful in defining the boundaries of the new nonattainment area, we do not believe that they justify ADEQ's conclusions about its recommended boundaries. ADEQ claims that the emissions inventory and maps demonstrate that sources in the eastern and southern regions of the county do not "significantly contribute" to violations in the other regions of the county. See page ES-3 of ADEQ's technical report. EPA notes, however, that CAA section 107(d)(1)(A) defines a nonattainment area as one that does not meet, or that "contributes to" ambient air quality in a nearby area that does not meet the NAAQS. The definition of nonattainment areas is not limited to areas that, in ADEQ's words, "significantly" contribute to a violating area. Moreover, ADEQ's maps show that areas immediately to the east and south of the recommended area (but still within the western half of the county) include the same types of emissions sources, with similar emissions densities, as those that predominate within the recommended area. For example, figure 3-3 (page 8 of State's technical report) shows emissions densities similar to those estimated within the State's recommended boundaries to the east in Coolidge and Florence, as well as south to Eloy. In addition, figures 3-4, 3-7, and 3-10 (on pages 11, 14, and 17, respectively, of the State's technical report) illustrate the locations of unpaved roads (with average daily traffic volumes greater than 100) and show that higher relative concentrations of PM₁₀ emissions from such sources as vehicle entrainment of dust over paved and unpaved roads, tilling and harvesting, and concentrated animal feeding operations (CAFOs) extend to central, and south central Pinal County. Thus, the emissions inventory data and related maps do not support the State's recommended boundaries but rather argue for a larger nonattainment area consisting of the western half of the county.

In contrast, EPA's proposed boundaries include all of the areas for which emissions data show relatively higher PM₁₀ emissions from the types of sources contributing the most to the overall PM₁₀ emissions inventory. For instance, based on the information sources described above in the State's technical report, EPA's proposed boundaries include the areas of relatively higher emissions densities in and around Coolidge, Florence, and Eloy that reflect the same types of PM₁₀-generating activities (vehicle entrainment of dust over paved and unpaved roads, tilling and harvesting, and CAFOs) as found within the smaller nonattainment area boundaries recommended by the State.

Factor 3: Population density and degree of urbanization

Table 5 shows the 2008 population density for municipalities and reservations within Pinal County.

Table 5. Population Density within Pinal County

| Entity | Area in Square Miles | 2008 Population Density | 2008 Population |
|---------------------|----------------------|-------------------------|---|
| Pinal County Total | 5,369.6 | 65.3 | 350,558 |
| Apache Junction | 34.2 | 958.4 | 32,776 |
| Casa Grande | 109* | 377.5 | 41,152 |
| Coolidge | 65* | 157.9 | 10,261 |
| Eloy | 110* | 115.9 | 12,750 |
| Florence | 50* | 415.6 | 20,781 |
| Kearny | 2.79 | 1,177.5 | 3,297 |
| Mammoth | 1.08 | 2,339.1 | 2,573 |
| City of Maricopa* | 43* | 1,059.8 | 45,571 |
| Queen Creek | 26* | 937 | Pinal Co: 5,700 Maricopa Co: 18,661 Total: 24,361 |
| Superior | 1.93 | 1,766.3 | 3,335 |
| Ak Chin | 87.2 | 48.3 | 1,591 |
| GRIC** | 581.1 | 37 | 21,665 |
| San Carlos Apache** | 2,896.6 | 3.6 | 10,416 |
| Tohono O'odham** | 4,453 | 3.1 | 13,635 |

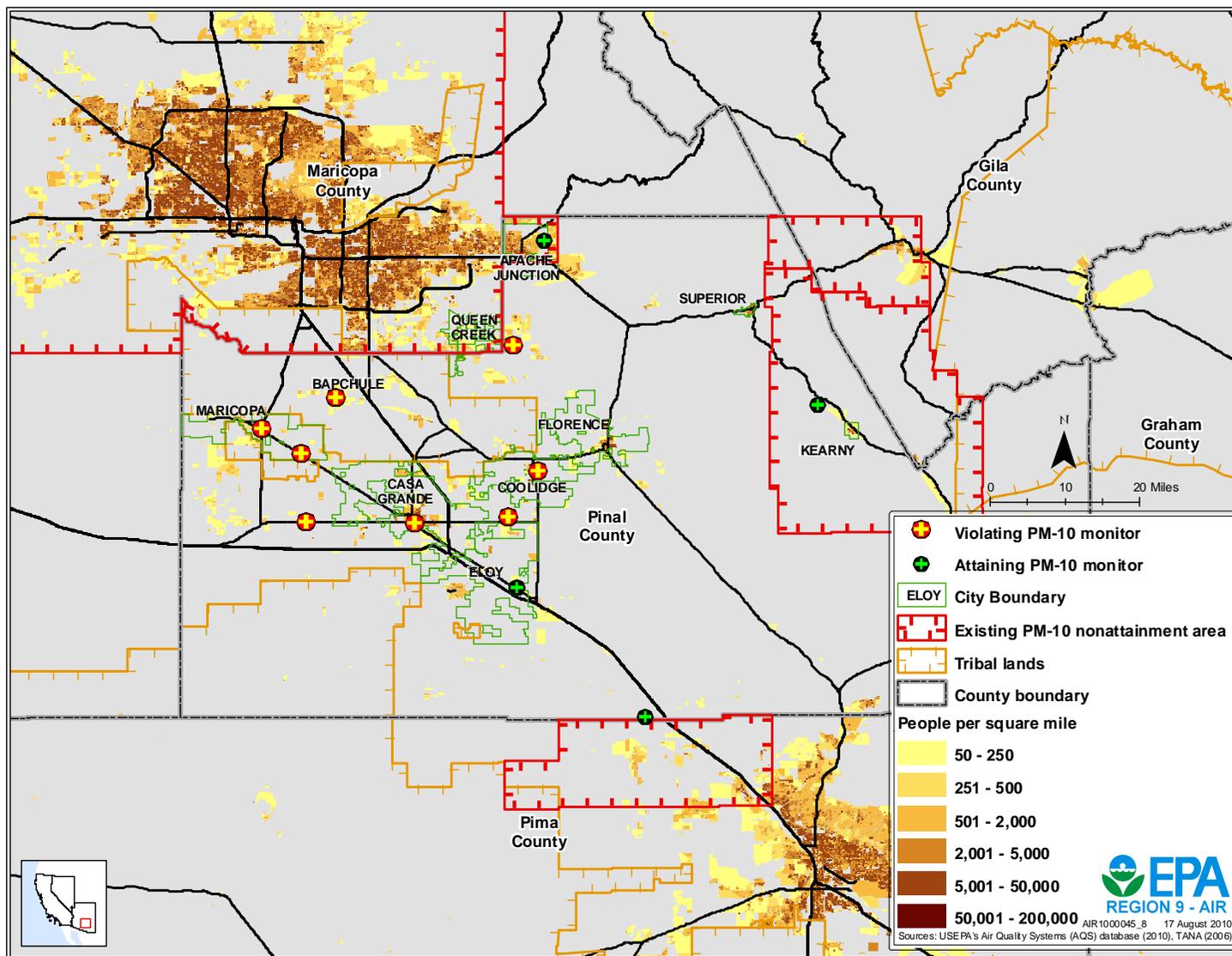
Source: U.S. Census Bureau and ADEQ's PM₁₀ boundary recommendation TSD dated March 15, 2010

*Area in square miles was taken from Table 3-5 of ADEQ's PM₁₀ boundary recommendation

**Population for entire reservation, including portions that lie outside of Pinal County.

Figure 7 illustrates that, as a whole, Pinal County is sparsely populated. Within Pinal County, about 95% of the population resides in the more urbanized areas that lie in the western/central portion of the county where a number of relatively densely populated areas are located. Even within those more densely populated areas, the numbers of inhabitants are relatively low (see Table 5).

Figure 7. Population density, PM₁₀ monitors, and existing PM₁₀ nonattainment areas



EPA believes that the size, density, and location of population can be indicative of emissions activity that contributes to violations of the 24-hour PM₁₀ NAAQS in an area. For example, because on-road (paved and unpaved road) emissions contribute significantly to the PM₁₀ emissions inventory in Pinal County, population data can give an indication of whether it is likely that an area is causing or contributing to violations of the 24-hour PM₁₀ standard. Based solely on this factor, certain portions of Pinal County would not be considered for redesignation as nonattainment given their low population. Although areas with low population can nonetheless have activities that result in high emissions that contribute to violations of the NAAQS, EPA believes that, outside of the existing PM₁₀ nonattainment areas, the majority of PM₁₀-related emissions activities in Pinal County occur within the more densely populated central and western portion of the county, which is more urbanized and also includes the majority of agricultural lands, roads, and cattle operations, lending weight to a partial county redesignation. See Factor 2 discussion and Figures 4 and 5.

In its technical report, ADEQ concludes that the eastern and southern portions of the county are largely undeveloped and have very low population densities, and finds that this information provides support for the State's recommended boundaries. However, like the emissions data discussed above, we believe that the data do not justify the restricted nature of the State's recommended boundaries, which exclude much of the western half of the County. Specifically, EPA believes that the State's recommended exclusion of areas in the eastern and southern sections of the western half of the county is contradicted by evidence showing that land use development in Pinal County extends further east and south than the State's recommended boundaries. For example, the State's recommended boundaries fail to include the agricultural and more urbanized uses in and around Eloy and the future growth areas along the two Interstate corridors. See figures 3-13 and 3-14 from the State's technical report. In contrast, EPA's proposed boundaries would include all of the western half of Pinal County (excluding TON's main reservation and the Apache Junction portion of the Phoenix PM₁₀ nonattainment area) and thereby would include the areas with relatively higher population densities and most of the areas where significant levels of growth are expected.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each surrounding county who drive to Pinal County, the percent of total commuters in each county who commute to Pinal County, the percent of total commuters in each county who commute into the statistical area in which Pinal county is located, as well as the total vehicle miles traveled (VMT)¹⁵ for each county, in millions of miles per year (see Table 6).

¹⁵The 2005 VMT data used for Tables 6 and 8 of this analysis has been derived using a methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2, December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document can be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation//2005_mobile_nei_version_2_report.pdf.

Table 6. Traffic and Commuting Patterns – 2005

| County | 2005 VMT (millions of miles) | Number Commuting to Pinal County | Percent Commuting to Pinal County | Number Commuting into Statistical Area* | Percent Commuting into Statistical Area |
|----------|------------------------------------|---|--|---|---|
| Pinal | 3,126 | 35,960 | 60.1 | 55,880 | 93.4 |
| Maricopa | 32,392 | 7,750 | 0.6 | 1,389,480 | 98.9 |
| Cochise | 1,906 | 40 | 0.1 | 260 | 0.6 |
| Gila | 536 | 330 | 1.9 | 1,390 | 7.9 |
| Graham | 373 | - | 0.0 | 150 | 1.4 |
| Pima | 8,759 | 1,970 | 0.5 | 3,810 | 1.0 |

*Pinal and Maricopa Counties comprise the Phoenix-Mesa-Scottsdale CBSA

Data on commuting illustrate that the majority of Pinal County’s working residents are employed within the county. Data from 2000¹⁶ illustrate that a sizeable number (19,918) commute to Maricopa County to the north, with 7,750 commuters entering Pinal from Maricopa County. About 2,600 Pinal County residents commute to Pima County to the south, while 1,970 Pima County residents commute into Pinal County. The number of commuters to and from other surrounding counties is negligible. See Table 6 and Figure 8.

According to the 2005 NEIv2, on-road emissions (from paved and unpaved roads) are the largest source of PM₁₀ in Pinal County and account for 8,426 tpy, or 38% of the overall PM₁₀ inventory. Traffic and VMT are therefore important considerations in the process of determining the nonattainment area boundary. ADEQ’s preliminary 2007 PM₁₀ emissions inventory attributes 83% (42,130 tpy) to on-road sources. See Factor 2 discussion.

The principal route for traffic through Pinal County (serving in-county as well as out-of-county commuters) is Interstate 10, which bisects the western portion of the county and connects metropolitan Phoenix (largely in Maricopa County) to the north with metropolitan Tucson (in Pima County) to the south. Unpaved roads are also concentrated in the western side of the county. The eastern portion of the county has far fewer unpaved roads, and the main highways (AZ 77, 79, and 177) experience much lower traffic volumes. See Figure 8 and Appendix B, Figures 2 and 4. Figure 9, reproduced from Arizona’s boundary recommendation, illustrates the distribution of on-road emissions in Pinal County.

ADEQ cites traffic and commuting patterns as a factor supporting the exclusion of the eastern half of the county from the new nonattainment area. While EPA agrees that it is reasonable to distinguish between the eastern and western sides of the county, EPA believes that the entire western half of the county, and not a small portion of it, as the State recommends, should be redesignated to nonattainment. EPA finds that traffic and commuting patterns do not make a case for the state’s recommendation, but rather lend support to the creation of a larger nonattainment area generally encompassing the western half of the County. See figure 3-17 from the State’s technical report, which shows much higher employment densities projections for year 2030 in the western half of the county than those in the eastern half but which also show higher

¹⁶ Arizona Air Quality Designations Technical Support Document; Boundary Recommendation for the Pinal County 24-hour PM₁₀ Nonattainment Area, Table 3-6. March 15, 2010

employment densities east and south of the State's recommended boundaries (but still within the western half of the county).

Figure 8. Traffic, commuting patterns, and PM₁₀ monitors

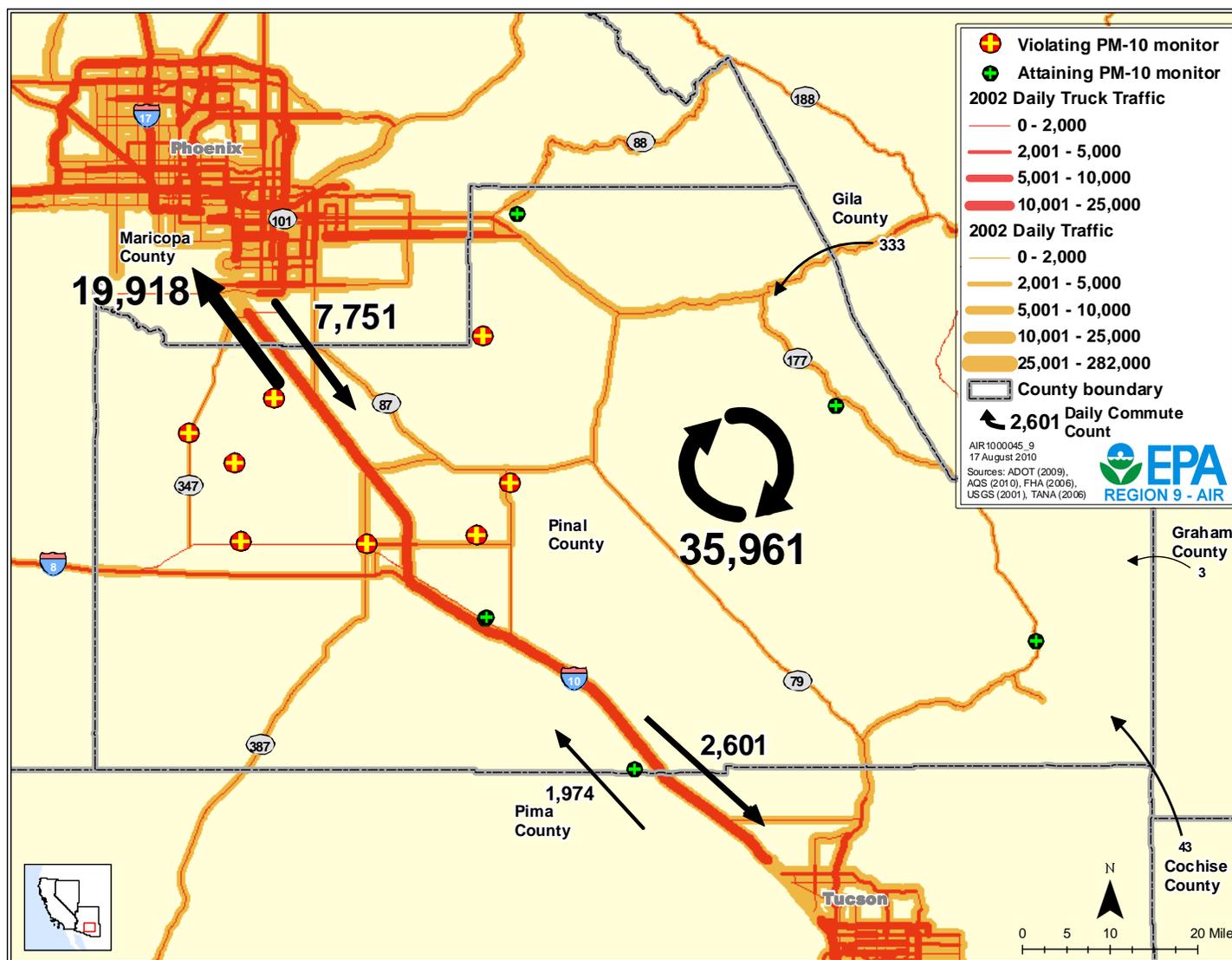
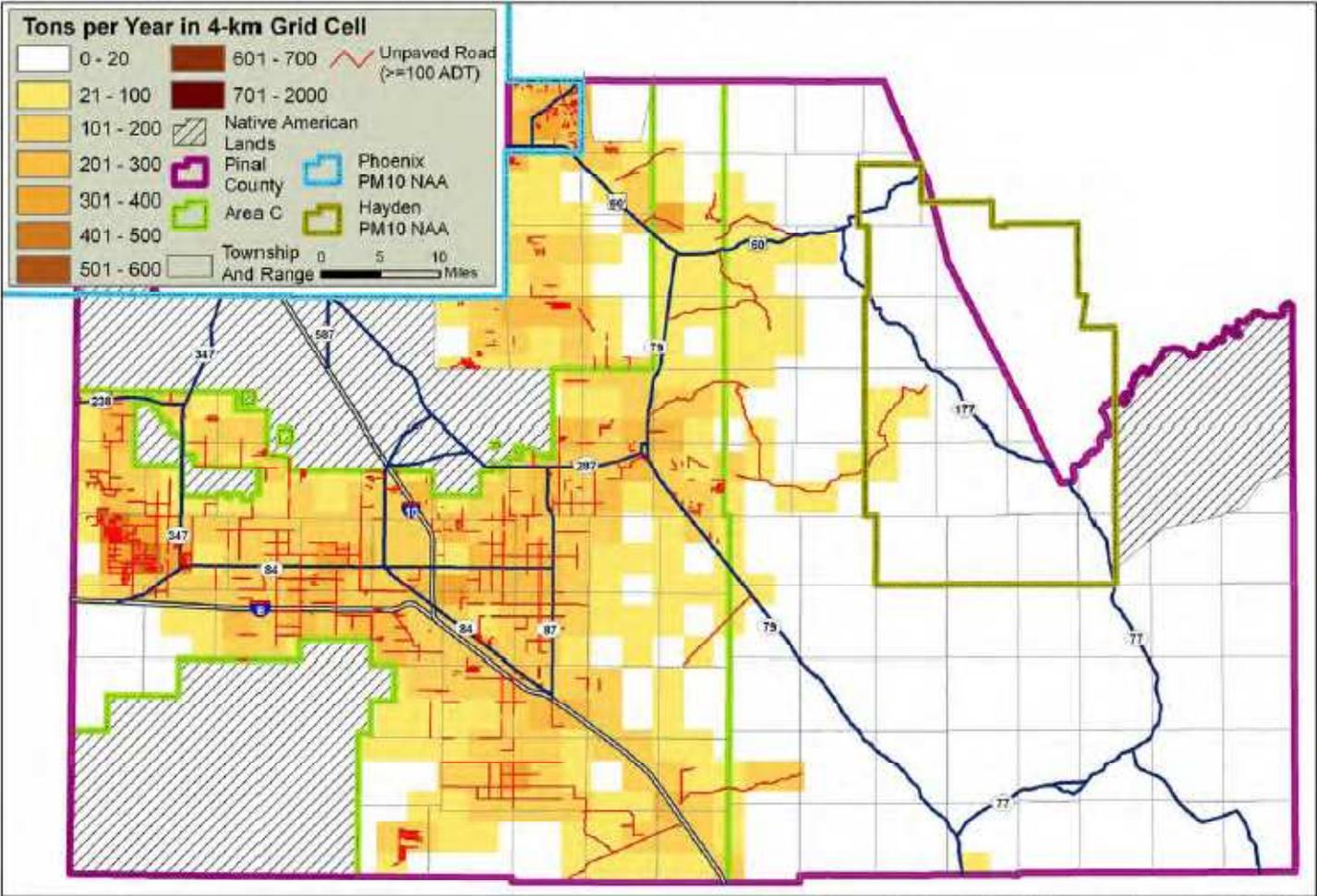


Figure 9. Preliminary PM₁₀ Emissions Inventory for Pinal County (2007) – Paved and Unpaved On-Road Sources (tons per year)



23 December 2009

Data and Cartography: Juan Declet, Phil Denee, and Nancy Caroli. AQD-ADEQ

Source: ADEQ Boundary Recommendation for the Pinal County 24-Hour PM₁₀ Nonattainment Area

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2008 and growth in vehicle miles traveled for 1996-2005 for Pinal County.

Arizona has experienced rapid population growth in recent years (26.7% between 2000 and 2008); however, vast areas remain sparsely inhabited. In Pinal County, the population increased 82% between 2000 and 2008, with almost all the population growth occurring in the central and western portion of the county. See Factor 3, Figure 7. Table 7 shows the 2008 population growth and density for municipalities within Pinal County. Decreases in population density for some areas reflect the expansion of the boundaries of municipalities, rather than reductions in population.

Table 7. Population Growth within Pinal County

| Entity | Area in Square Miles 2000/2009-10 | Population Density | | Population | |
|--------------------|--------------------------------------|--------------------|---------|--|--|
| | | 2000 | 2008 | 2000 | 2008 |
| Pinal County Total | 5,369.6 | 33.5 | 65.3 | 179,727 | 350,558 |
| Apache Junction | 34.23 | 929.3 | 958.4 | 31,814 | 32,776 |
| Casa Grande | 48.17/109* | 523.7 | 377.5 | 25,224 | 41,152 |
| Coolidge | 5.03/65* | 1,549.1 | 157.9 | 7,786 | 10,261 |
| Eloy | 71.67/110* | 144.8 | 115.9 | 10,375 | 12,750 |
| Florence | 8.29/50* | 2,056.2 | 415.6 | 17,054 | 20,781 |
| Kearny | 2.79 | 805.4 | 1,177.5 | 2,249 | 3,297 |
| Mammoth | 1.08 | 1,626.5 | 2,339.1 | 1,762 | 2,573 |
| City of Maricopa | 4.04/43* | 257.6 | 1,059.8 | 1,040 | 45,571 |
| Queen Creek** | 25.7 | 167.3 | 944.2 | Pinal Co: 119 Maricopa Co: 4,197 Total: 4,316 | Pinal Co: 5,700 Maricopa Co: 18,661 Total: 24,361 |
| Superior | 1.93 | 1,684.6 | 1,766.3 | 3,254 | 3,335 |

Source: U.S. Census Bureau and ADEQ's PM₁₀ boundary recommendation TSD, dated March 15, 2010.

*2009-2010 area in square miles is from Table 3.5 of ADEQ's PM₁₀ boundary recommendation TSD.

** Queen Creek straddles the Pinal and Maricopa County border, with about 23.4% of the city's area lying within Pinal County. The population figures in the table are pro-rated to reflect the proportion of the city that is within each county, but density is not pro-rated.

Along with the growth in population, VMT has increased dramatically.

Table 8. Population and VMT Values and Percent Change.

| Location | Population (2005) | Population Density (2005) | Population % change (2000 - 2005) | 2005 VMT (millions mi) | VMT % change (1996 to 2005) |
|----------|-------------------|---------------------------|-----------------------------------|------------------------|-----------------------------|
| Pinal | 240,044 | 45 | 32 | 3,126 | 54 |

ADEQ submitted maps showing population densities both under current conditions and projections for the year 2030 when the population of Pinal County is anticipated to exceed 1,000,000. Under existing conditions, higher population densities are found in the west central portion of the county, but there are also population centers in the northern (Apache Junction and Queen Creek) and southern portions (Eloy) of the county. ADEQ's maps show that future growth is expected to be concentrated in the Interstate 8 and 10 corridors which extend through the west central and southern portions of the county, although a certain amount of growth is also expected in the Falcon Valley area further to the east. See Figures 3-14 and 3-17 in ADEQ's technical report.

EPA finds that growth rates and patterns do not make a case for the state's recommendation, but rather lend support to the creation of a larger nonattainment area generally encompassing the western half of the County. By redesignating the western portion of Pinal County as nonattainment for PM₁₀, EPA would include most of the population and the rapidly growing areas along the I-10 and I-8 corridors.

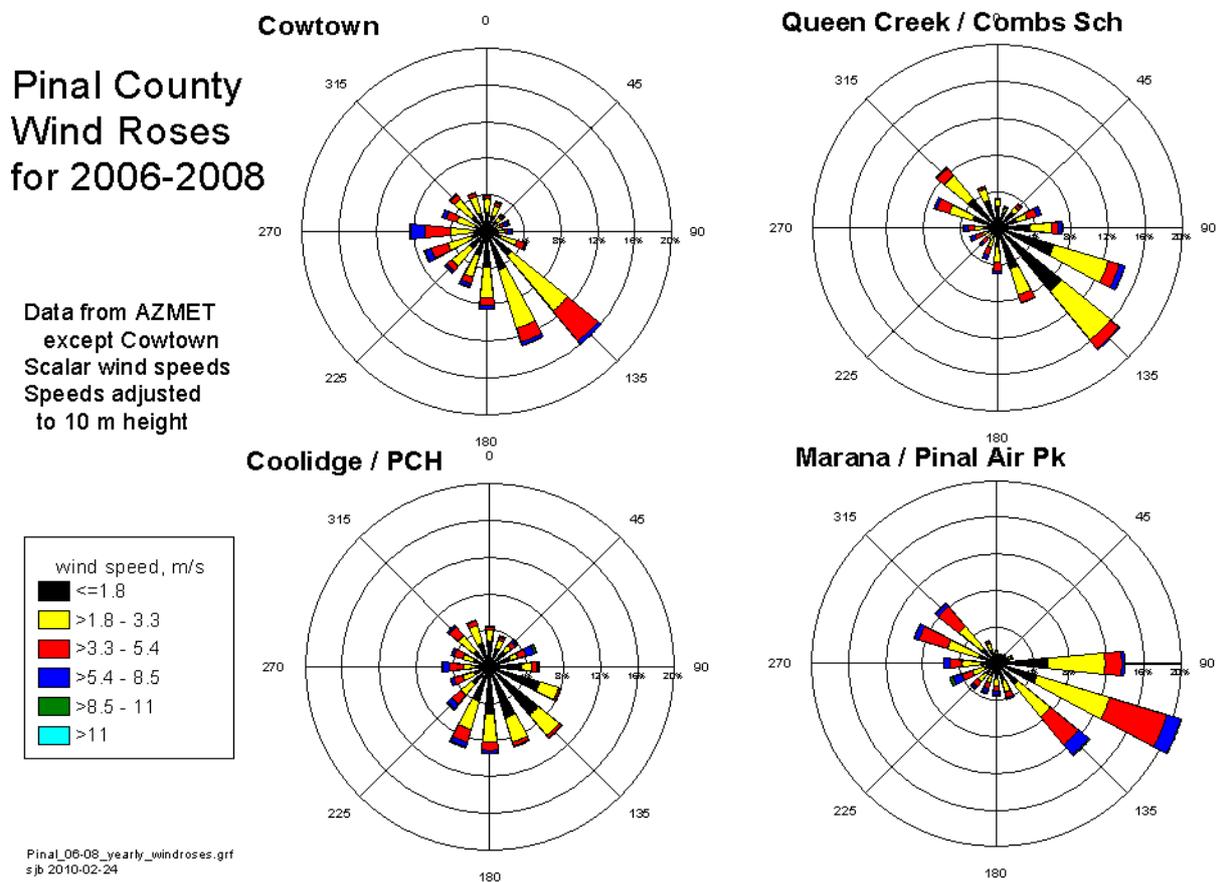
Factor 6: Meteorology

Like most of Arizona, Pinal County is generally hot and dry. Average maximum temperatures at the Maricopa weather station (part of the National Weather Service Cooperative Network) range from 67 degrees Fahrenheit (°F) in January to 107°F in July, and minimum temperatures from 25°F in January to 75°F in August. The rainiest month is July, with just over an inch of rain; the yearly total averages 8 inches. Despite the dryness, there is substantial agriculture in Pinal County, supported by irrigation from groundwater and the Central Arizona Project. Weather systems typically arrive from the west, except during "monsoon" season, which occurs during June through August or September, when moisture from the south arrives and creates thunderstorms.

EPA examined wind data collected at the Cowtown monitoring site and also at stations in the AZMET meteorological network. In the western portion of the County, at the Cowtown and Maricopa monitors, typically there is wind from the southeast during the cooler evening hours, corresponding to downhill drainage flow down the Gila River valley. Flow at other times is less consistent, though there can be steady winds from the west in late morning through the afternoon, and on occasion from the north or south. In the center of Pinal County, at Coolidge (near the Pinal County Housing monitor), flow can be from any direction, though it tends to range from the southwest to southeast in the second and third quarters of the year. In the north, at Queen Creek (near the Combs School monitor, where the Phoenix serious PM₁₀ nonattainment area lies immediately to the west and to the north), flow is mainly from the southeast. There is some northwest flow in May through July; exceedances may occur then though they are more common in winter. Finally, in the south at Marana (near the Pinal Air Park monitor, which does not violate the NAAQS), flow is mainly from the east-southeast, with easterly flow predominant in the winter. With a few exceptions, flow is not from the north and northwest, making transport of PM₁₀ from the metropolitan Phoenix area unlikely under most circumstances. See Figure 10.

While there are periods of high wind and gusts, especially during “monsoon” season, wind speeds are most often 3 meters per second or less, with higher speeds usually from the west. High wind and gusts, especially over disturbed desert areas, can lead to substantial fugitive dust emissions. Sometimes there are “haboob” dust storms that have the appearance of an approaching “wall of dust,” in which visibility is very low and gusts very strong. It is possible that some PM₁₀ exceedances are caused by wind-generated dust near the monitors, with some moderate-range transport.

Figure 10. Pinal County Wind Roses for 2006 – 2008



The State recommends including the agricultural basin region of the county where stagnation conditions are known to impact PM₁₀ concentrations. While we agree that the new nonattainment area should include the agricultural basin region where stagnation conditions occur, we find that the State's recommended boundaries do not in fact accomplish this. As shown on page 14 of ADEQ's technical report, the agricultural basin region of the county, roughly defined based on tilling and harvesting emissions within the county, lies in the western half of the county, and also extends south of Interstate 10 towards the southern county line. Moreover, as discussed in the following paragraph, a review of available wind data supports the inclusion of areas to the south and east of the violating monitors (i.e., beyond the State's recommended boundaries) based on the prevalence of winds from the southeast quadrant.

EPA has considered the information provided by ADEQ but also reviewed available wind data for Pinal County and finds that winds are similar throughout central and western Pinal County in that the predominant wind directions are from the southeast quadrant. See Figure 10. The predominance of southeast winds support boundaries that extend south and east of the violating monitors because PM₁₀ sources, including agricultural activities and unpaved roads, are found in those directions. EPA's recommended boundaries encompass the types of sources that are believed to cause or contribute to the monitored violations and that are located east and south of the violating monitors, whereas the State's recommended boundaries largely exclude these sources. See Figures 1, 4, and 5.

Lastly, EPA recognizes that high wind events do occur in Pinal County, and that some of these events may result in monitored particulate matter exceedances that qualify as caused by exceptional events under EPA's exceptional events rule.¹⁷ However, as ADEQ itself acknowledges, even if EPA were eventually to determine that all of the exceedances that ADEQ has flagged are caused by "exceptional events," the area would still clearly be in violation of the PM₁₀ NAAQS.

Factor 7: Geography and topography

The geography/topography analysis evaluates the physical features of the land that might have an effect on the airshed and, therefore, on the distribution of PM₁₀ over the Pinal County area.

Pinal County has topographical barriers significantly limiting air pollution transport within its airshed and from neighboring airsheds, though these barriers are not absolute. Therefore, this factor provides some support for EPA's suggested boundary for the nonattainment area.

As shown in Figure 11, Pinal County generally has fairly low relief and is at around 1,200 feet elevation, but it is punctuated by various mountains and ranges having peaks generally from

¹⁷ On March 22, 2007, EPA adopted a final rule, *Treatment of Data Influenced by Exceptional Events*, to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the rule, EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an "exceptional event" caused the exceedances, and satisfies other criteria set forth by the rule. See 72 FR 13560.

3,000 to 5,000 feet. Some 50 miles east of the violating monitors, the eastern quarter of the county becomes more mountainous, ultimately rising to some 6,000 feet near the eastern borders with Gila and Graham Counties. The mountain ranges generally run southeast-northwest, and do not form closed basins. Rather, there are broad desert valleys. In the vicinity of the violating monitors, there are the Sacaton Mountains to the east, rising to 2,235 feet, the Maricopa Mountains to the west, with elevations up to 2,400 feet. Nearest is the southeastern tip of the Sierra Estrella Mountains, starting at about 10 miles northwest of the Cowtown monitor; they have peaks to 3,000 and 4,500 feet. To the north, between Pinal and Maricopa Counties, are the South Mountains rising to 2,500 feet; they run west-southwest to east-northeast, unlike most of the ranges. They are only 10 miles long, but along with the Sierra Estrella they do form a partial barrier between Pinal County and metropolitan Phoenix to the north.

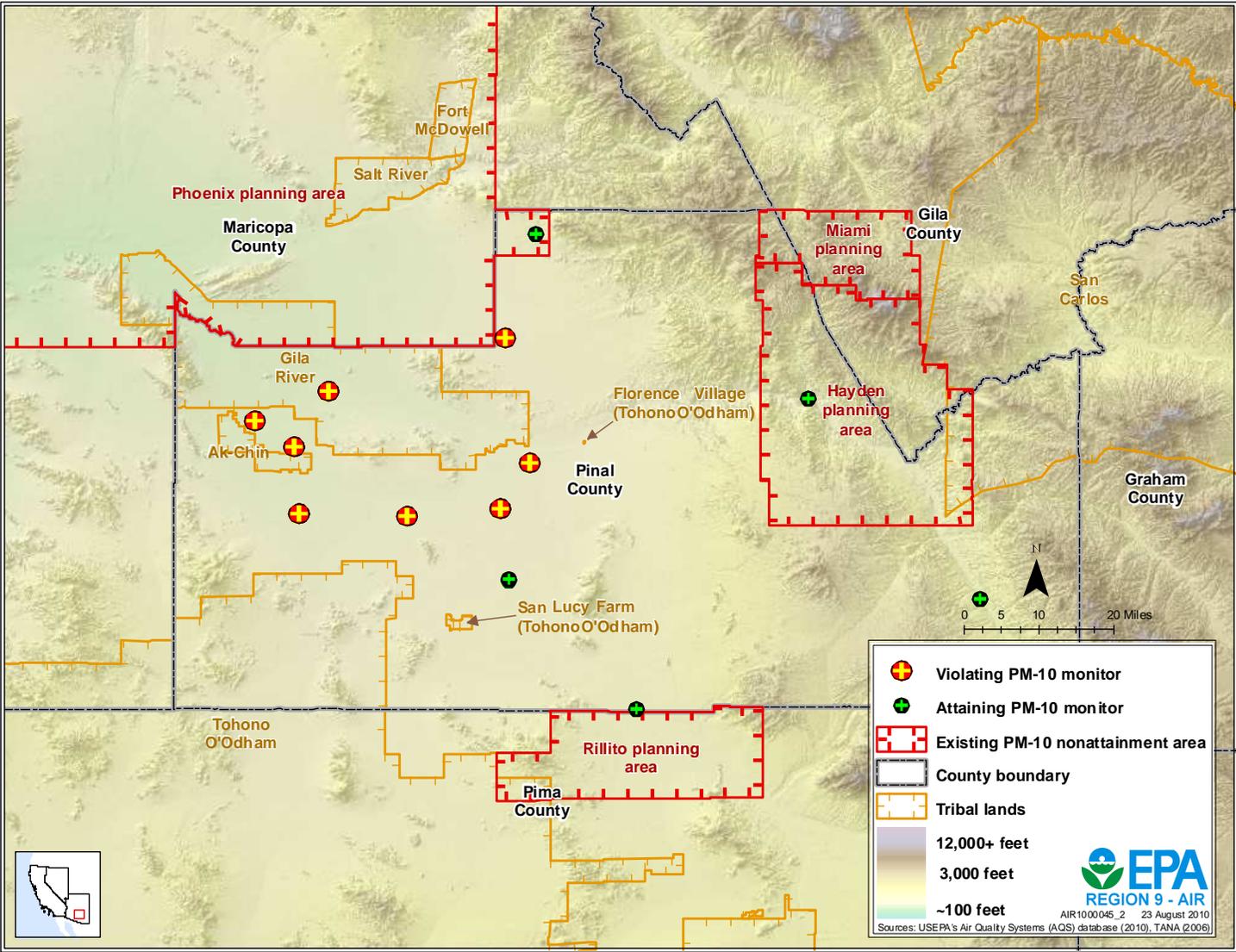
Overall, the mountains within the county can redirect winds, and form a partial barrier to transport from the eastern portions of Pinal County.

ADEQ finds that topographic considerations support the State's inclusion of the basin region of the county, which is characterized by open-ended valleys with few topographic barriers within the recommended boundaries. Conversely, ADEQ finds that topographic considerations support the State's exclusion from the recommended boundaries of the eastern portion of the county, which is characterized by rough terrain and steep mountain ranges reaching over 7,000 feet in elevation.

EPA generally agrees with ADEQ's description of the topography of Pinal County. We believe that the various mountain ranges found on each side of the county inhibit transport of PM₁₀ (which is largely crustal in composition – see Figure 6) from outside the county to the violating monitors within the county. Within the county itself, we believe that the mountains in the eastern quarter of the county, which rise to approximately 6,000 feet near the eastern borders with Gila and Graham counties, inhibit intra-county transport from sources located in the eastern quarter to the violating monitors. See figure 11 of EPA's TSD. (The portion of the San Carlos Apache Reservation that lies within Pinal County is located in the eastern quarter of the county.)

However, the existence of the steep mountain ranges in the eastern quarter of the County does not justify ADEQ's recommendation to exclude from redesignation a much larger section of the western half of the County. EPA believes that, taking other factors into account, the western half of the County, located in the basin region that features few topographic barriers, should be redesignated to nonattainment. Indeed, it is arguable that topography alone would lend support to redesignating a far larger area than EPA is proposing, one that would encompass the entire county, excepting only the eastern quarter. However, EPA believes that topography when evaluated in the context of the various other factors, supports redesignation of the western half of the county, rather than the much more restricted boundaries that ADEQ suggests.

Figure 11. Topography



Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional factor, EPA considered the planning and organizational structure of Pinal County and the State of Arizona to ensure that the implementation of controls within the prospective nonattainment area can be carried out in a cohesive manner. Figure 12 shows boundaries for Pinal and neighboring counties, nearby nonattainment areas, and Indian lands.

The Arizona Department of Environmental Quality has overall jurisdiction over environmental programs in the state of Arizona, as well as jurisdiction over certain source types, including smelters, refineries, coal-fired power plants, and retains authority for regulating emissions from agricultural operations. Three Arizona counties, Maricopa, Pima, and Pinal, have their own air pollution control programs and operate pursuant to agreements with ADEQ. The lead air quality planning agencies responsible for state implementation plans (SIPs) for Maricopa County and Pima County are the metropolitan planning organizations (MPO), the Maricopa Association of Governments (MAG) and the Pima Association of Governments (PAG), respectively. There is no MPO and thus no lead air quality planning agency for SIP purposes in Pinal County. Therefore, ADEQ is responsible for developing SIPs for Pinal County. Pinal County has permitting authority, and can adopt control measures by rule, but is preempted from adopting rules regulating certain categories of sources that are regulated by the State.

Four tribes are located in Pinal County. The Ak-Chin Indian Community tribal lands lie entirely within the County, and are encircled by the proposed nonattainment area. Approximately two-thirds of the Gila River Indian Community tribal lands lie within the boundaries of Pinal County; the other third is in Maricopa County and is part of the Maricopa County serious PM₁₀ nonattainment area. A portion of the main reservation of the Tohono O'odham Nation lies in southeastern Pinal County, south of the proposed nonattainment area. Two additional areas (San Lucy Farm and Florence Village) lie to the east and northeast of the main TON reservation, within the proposed nonattainment area. A portion of the San Carlos Apache tribal lands lie within the eastern part of Pinal County, east of the proposed nonattainment area. See Figure 12.

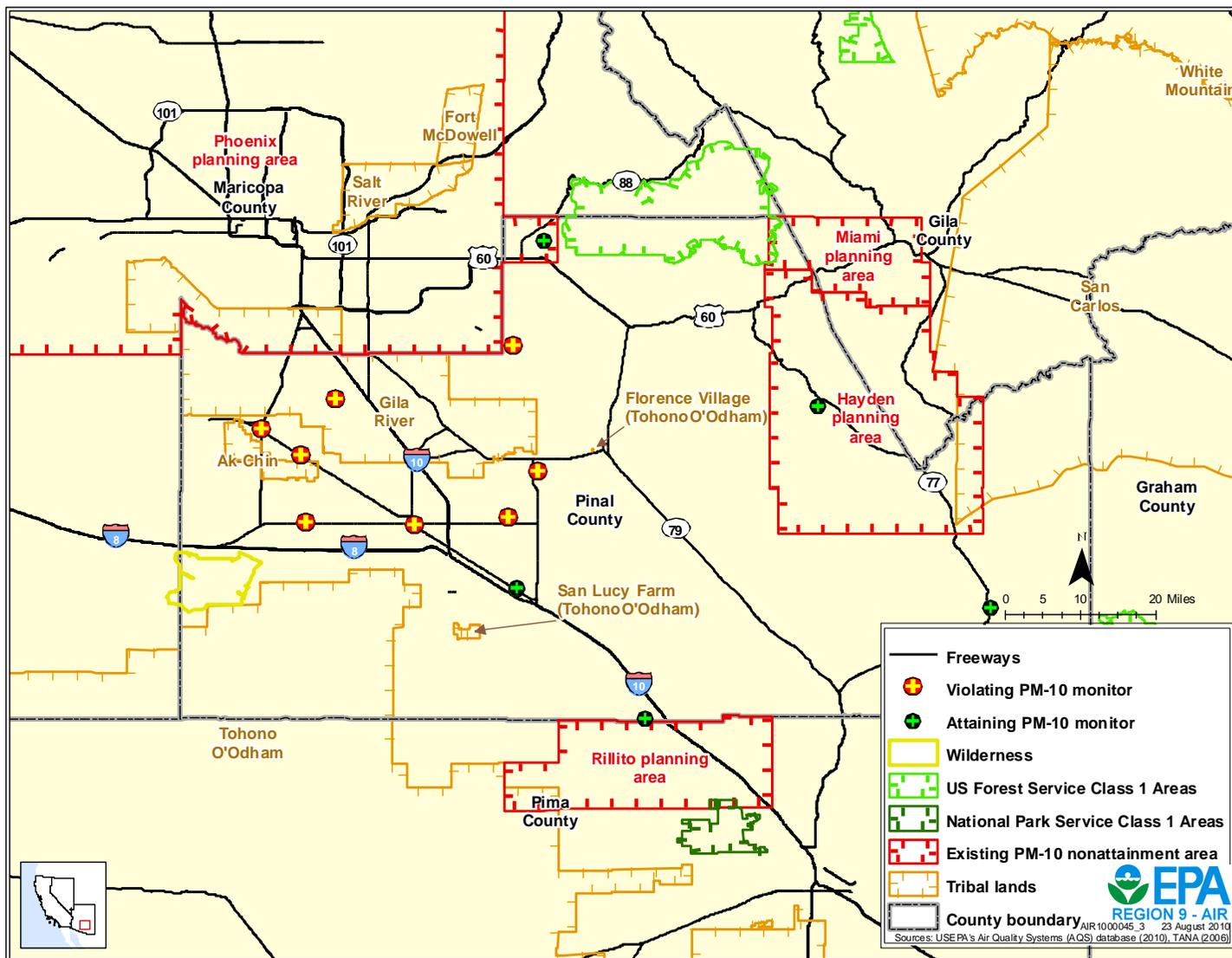
Of the four tribes, only the Gila River Indian Community has treatment as a state (TAS) status for Clean Air Act section 107 designations and an air quality monitoring network that reports quality-assured data to EPA's Air Quality System (AQS). We recently proposed approval of GRIC's submitted tribal implementation plan. See 75 FR 48880, August 12, 2010. None of the other tribes currently monitor for PM₁₀, although the Ak-Chin Indian Community has been developing an air monitoring program.

As noted above, EPA is deferring action on the Ak Chin and Gila River Indian Community lands within Pinal County, and the San Lucy Farm and Florence Village portions of the TON, which lie to the east and northeast of the main reservation in order to allow time for formal consultation to occur. Neither ADEQ nor Pinal County has jurisdiction over tribal lands.

The Apache Junction area of Pinal County is part of the Phoenix PM₁₀ nonattainment area. The Hayden and Miami PM₁₀ nonattainment areas lie to the east.

In its technical report, ADEQ notes that five cities and towns (Casa Grande, Coolidge, Eloy, Florence, and City of Maricopa), as well as a portion of a sixth (Queen Creek) are located in central and western Pinal County. ADEQ indicates that the incorporated boundaries of these municipalities have been taken into account in developing the nonattainment area boundaries. However, EPA's review of the incorporated boundaries of these municipalities (see, e.g., Figure 2) shows that the State's recommended boundaries omit portions of the City of Maricopa and Coolidge, and most of Florence and Eloy. In contrast, EPA's proposed nonattainment area boundaries encompass all of these cities and towns, where most of the county's population resides. Inclusion of entire cities and towns within the nonattainment area boundaries would facilitate attainment planning to the extent that such local governments will ultimately be relied upon for development and/or implementation of specific PM₁₀ control measures.

Figure 12. Jurisdictional Boundaries



Factor 9: Level of control of emission sources

Under this factor, we consider the existing level of control of emissions. The emissions data used by EPA in this technical analysis and provided in Table 3 (under Factor 2) represent emissions levels taking into account any control strategies implemented in Pinal and nearby counties before 2005 on stationary, mobile, and area sources. EPA is not aware of any additional information on emissions controls that is relevant to assessing sources contributing to the monitored violations. EPA is proposing to designate those portions of Pinal County that encompass the emissions sources and activities that contribute to the violations in this area.

Pinal County AQCD has established rules for dust abatement purposes that apply within a subarea of Pinal County established under state law (Arizona Revised Statutes section 49-541) and referred to as “Area A.” Within Pinal County, “Area A” generally refers to an area encompassing the Pinal County portions of Apache Junction and Queen Creek. Pinal County has also adopted a number of ordinances that are also intended to reduce dust generated within “Area A.” These include ordinances placing restrictions on residential fireplaces, leaf blowers, open burning, vehicle commute trips, and vehicle idling. For one township located within “Area A,” the township included in the Phoenix Area PM₁₀ nonattainment area (i.e., Township 1 north, range 8 east; referred to as “Apache Junction”), Pinal County AQCD has adopted further dust abatement rules.¹⁸ The State’s recommended boundaries include a portion, but not all, of “Area A.” In contrast, EPA’s proposed boundaries for the new nonattainment area would encompass all of “Area A,” thereby facilitating review and modification of these existing PM₁₀ emissions controls within the broader SIP attainment planning context.

Conclusion

Based on the weight of evidence, and an evaluation of all the factors discussed above, EPA is proposing to redesignate the western portion of Pinal County, Arizona (excluding the main TON reservation), as nonattainment for the 1987 24-hour PM₁₀ NAAQS, as set forth in Figure 2. Inventory and speciation data point to onroad emissions (paved and unpaved), agriculture (including feedlots), construction, and industrial processes as the primary contributors to nonattainment. The vast majority of these activities are occurring on the western side of Pinal County leading EPA to conclude that a nonattainment area (NAA) that incorporates the western portion of the County is appropriate.

The expected exceedance values of monitors deployed throughout the area reinforce the partial county redesignation. EPA’s intended nonattainment area boundary encompasses all violating monitors that are not otherwise included in previously designated nonattainment areas. The intended nonattainment area also includes areas that are not

¹⁸ The township referred as to Apache Junction would be unaffected by our proposed action and would remain part of the Phoenix planning area, which is designated as a “serious” PM₁₀ nonattainment area.

violating the standard, but by virtue of the source mix and meteorology, may be contributing to the violations recorded elsewhere.

CAA section 107(d)(3)(C) provides that after notifying the Governor of State of its intent to redesignate an area, EPA shall promulgate the redesignation, if any, of the area or portion thereof, submitted by the Governor, "making such modifications as EPA may deem necessary...." Pursuant to CAA section 107(d)(3), we have reviewed the State's recommendation (dated March 23, 2010) and related technical report (submitted on March 26, 2010).

Both EPA and the State agree that sources outside of the county do not contribute to PM₁₀ violations at the violating monitors within the county, and that sources in the eastern half of the county do not contribute to the violating monitors (which are concentrated in the central and western portions of the county). But while EPA and the State both use the nine-factor analysis for evaluation of the prospective nonattainment area boundaries, we reach quite different results.

As explained above, EPA does not believe that the State's recommended boundaries encompass the full geographic area from which emissions-generating activities contribute to the monitored PM₁₀ violations. More specifically, we believe that the Governor's recommended boundaries, which cut through municipalities and contiguous expanses of agricultural fields, exclude sources that have been identified as dominant sources of PM₁₀ and that are contributing to elevated levels of PM₁₀ at violating monitors.

We believe that our proposed boundaries, which are defined as all land geographically located within Pinal County west of the north-south line defined by the boundary between Townships 10E and 11E, but excluding TON's main reservation and excluding the existing Apache Junction portion of the existing Phoenix PM₁₀ nonattainment area, encompass the areas in which PM₁₀ violations are being monitored, as well as the areas that contribute to the monitored violations, and that they are thus consistent with the definition of nonattainment areas in CAA section 107(d)(1)(A). Our conclusion is based on EPA's analysis of the factors as set forth in the body of this document. In sum, we base our proposed boundaries on the following considerations: (1) monitored violations occur in the west, central and northern portions of the western half of the county, not in the eastern half (i.e., outside of existing PM₁₀ nonattainment areas); (2) the emissions from agricultural operations, feedlots, dairies, and other cattle operations, as well as roads, are concentrated in the western half of the county; (3) population densities are much greater in the western half of the county than in the eastern half and growth is expected to be concentrated primarily along the Interstate corridors that extend through the western half of the county; (4) Interstate 10, which connects Pinal County with the employment centers in metropolitan Phoenix and Tucson, bisects the western half of Pinal County; (5) predominant southeasterly winds support inclusion of PM₁₀ sources in areas to the south and east of the violating monitors; (6) the western half of Pinal County encompasses the incorporated boundaries of all of the cities in Pinal County (Apache Junction, Casa Grande, Coolidge, Eloy, Maricopa), as well as the larger towns (Florence and Queen Creek) thereby potentially facilitating implementation of future control

measures; and (7) dust abatement measures already in effect in “Area A” (within Pinal County) can readily be applied, as necessary and appropriate, throughout the other portions of the western half of Pinal County. Figure 2 compares the State’s recommended boundaries to EPA’s proposed boundaries.

EPA therefore deems it necessary and appropriate to propose boundaries that differ from the State’s recommended boundaries and that we believe better satisfy air-quality data, planning, control and other air-quality related considerations. CAA Section 107(d)(3). Under CAA section 107(d)(3)(C), EPA must notify the State whenever EPA intends to modify State recommendations concerning boundaries for areas to be redesignated, at least 60 days prior to EPA promulgation of final redesignations. EPA will provide notification to Arizona shortly after the Federal Register notice proposing our action is signed.

Appendix A
Emissions in Pinal County: Primary PM₁₀, NO_x, NH₃, SO₂, VOCs.

Pinal County: Emission Totals Per County (tons per year). 2005 NEI version 2.

| County | Primary PM₁₀ Emissions | NO_x | NH₃ | SO₂ | VOC |
|---------------|--|-----------------------|-----------------------|-----------------------|------------|
| Pinal | 22,088 | 12,545 | 5,646 | 757 | 9,217 |

Pinal County: Primary PM₁₀ (Includes Filterables + Condensibles) Sources. 2005 NEI version 2.

| Source Category | Emissions (tpy) | % of Total Primary PM₁₀ Emissions |
|---------------------------------------|------------------------|---|
| Nonpoint | | |
| Unpaved Roads | 6,253 | 28% |
| Construction | 5,439 | 25% |
| Agric - Crop Tilling & Livestock Dust | 5,008 | 23% |
| Paved Roads | 2,171 | 10% |
| Indus Process - NEC | 955 | 4% |
| Waste Disposal - Open Burning | 906 | 4% |
| Wildfires | 466 | 2% |
| Other Nonpoint | 149 | 1% |
| Nonroad | | |
| Non-Road Equipment - Diesel | 171 | 1% |
| Misc. Nonroad | 106 | 0% |
| Onroad | | |
| On-Road Vehicles - Diesel | 135 | 1% |
| On-Road Vehicles - Gasoline | 85 | 0% |
| Point | | |
| Waste Disposal | 205 | 1% |
| Misc. Point | 39 | 0% |
| TOTAL: | 22,088 | 100% |

Pinal County: Nitrogen Oxides (NO_x) Sources. 2005 NEIv2.

| Source Category | Emissions (tpy) | % of Total NO _x Emissions, Pinal County |
|--------------------------------------|-----------------|--|
| Onroad | | |
| On-Road Vehicles - Diesel | 3,889 | 31% |
| On-Road Vehicles - Gasoline | 3,715 | 30% |
| Nonroad | | |
| Planes, Trains, & Ships | 2,275 | 18% |
| Non-Road Equipment - Diesel | 1,775 | 14% |
| Non-Road Equipment - Gasoline | 142 | 1% |
| Nonpoint | | |
| Waste Disposal - Open Burning | 235 | 2% |
| Wildfires | 113 | 1% |
| Fuel Comb - Industrial Boilers, ICEs | 81 | 1% |
| Fuel Comb - Residential Fossil | 65 | 1% |
| Other Nonpoint | 35 | 0% |
| Point | | |
| Fuel Comb - Electric Utility | 173 | 1% |
| Misc. Point | 47 | 0% |
| TOTAL: | 12,545 | 100% |

Pinal County: Ammonia (NH₃) Sources. 2005 NEIv2.

| Source Category | Emissions (tpy) | % of Total NH ₃ Emissions, Pinal County |
|------------------------------|-----------------|--|
| Nonpoint | | |
| Livestock Waste | 4,344 | 77% |
| Fertilizer Application | 845 | 15% |
| Other Nonpoint | 75 | 1% |
| Onroad | | |
| On-Road Vehicles - Gasoline | 305 | 5% |
| On-Road Vehicles - Diesel | 9 | 0% |
| Point | | |
| Fuel Comb - Electric Utility | 65 | 1% |
| Nonroad | | |
| Misc. Nonroad | 2 | 0% |
| TOTAL: | 5,646 | 100% |

Pinal County: Sulfur Dioxide (SO₂) Sources. 2005 NEIv2.

| Source Category | Emissions (tpy) | % of Total SO ₂ Emissions, Pinal County |
|--------------------------------------|-----------------|--|
| Nonroad | | |
| Non-Road Equipment - Diesel | 244 | 32% |
| Planes, Trains, & Ships | 163 | 22% |
| Non-Road Equipment - Gasoline | 1 | 0% |
| Nonpoint | | |
| Fuel Comb - Industrial Boilers, ICEs | 130 | 17% |
| Wildfires | 48 | 6% |
| Other Nonpoint | 21 | 3% |
| Onroad | | |
| On-Road Vehicles - Diesel | 105 | 14% |
| On-Road Vehicles - Gasoline | 38 | 5% |
| Point | | |
| Misc. Point | 7 | 1% |
| TOTAL: | 757 | 100% |

Pinal County: Volatile Organic Compounds (VOC) Sources. 2005 NEIv2.

| Source Category | Emissions (tpy) | % of Total VOC Emissions, Pinal County |
|---------------------------------|-----------------|--|
| Onroad | | |
| On-Road Vehicles - Gasoline | 3,539 | 38% |
| On-Road Vehicles - Diesel | 200 | 2% |
| Nonroad | | |
| Non-Road Equipment - Gasoline | 1,476 | 16% |
| Non-Road Equipment - Diesel | 195 | 2% |
| Planes, Trains, & Ships | 96 | 1% |
| Nonpoint | | |
| Wildfires | 978 | 11% |
| Gas Stations | 687 | 7% |
| Waste Disposal - Open Burning | 642 | 7% |
| Solvent - Non-industrial | 518 | 6% |
| Surface Coating - Industrial | 206 | 2% |
| Miscellaneous Sources | 186 | 2% |
| Surface Coating - Architectural | 176 | 2% |
| Other Nonpoint | 239 | 3% |
| Point | | |
| Misc. Point | 80 | 1% |
| TOTAL: | 9,217 | 100% |

Appendix B.
ADEQ Maps of PM₁₀ Sources.

From Arizona Department of Environmental Quality, Boundary Recommendation for the Pinal County 24-hour PM₁₀ Nonattainment Area: March 15, 2009.
<http://www.azdeq.gov/environ/air/plan/download/032910c.pdf>

Figure 1. ADEQ Map of significant sources of PM₁₀ in Pinal County (preliminary 2007 emissions inventory)

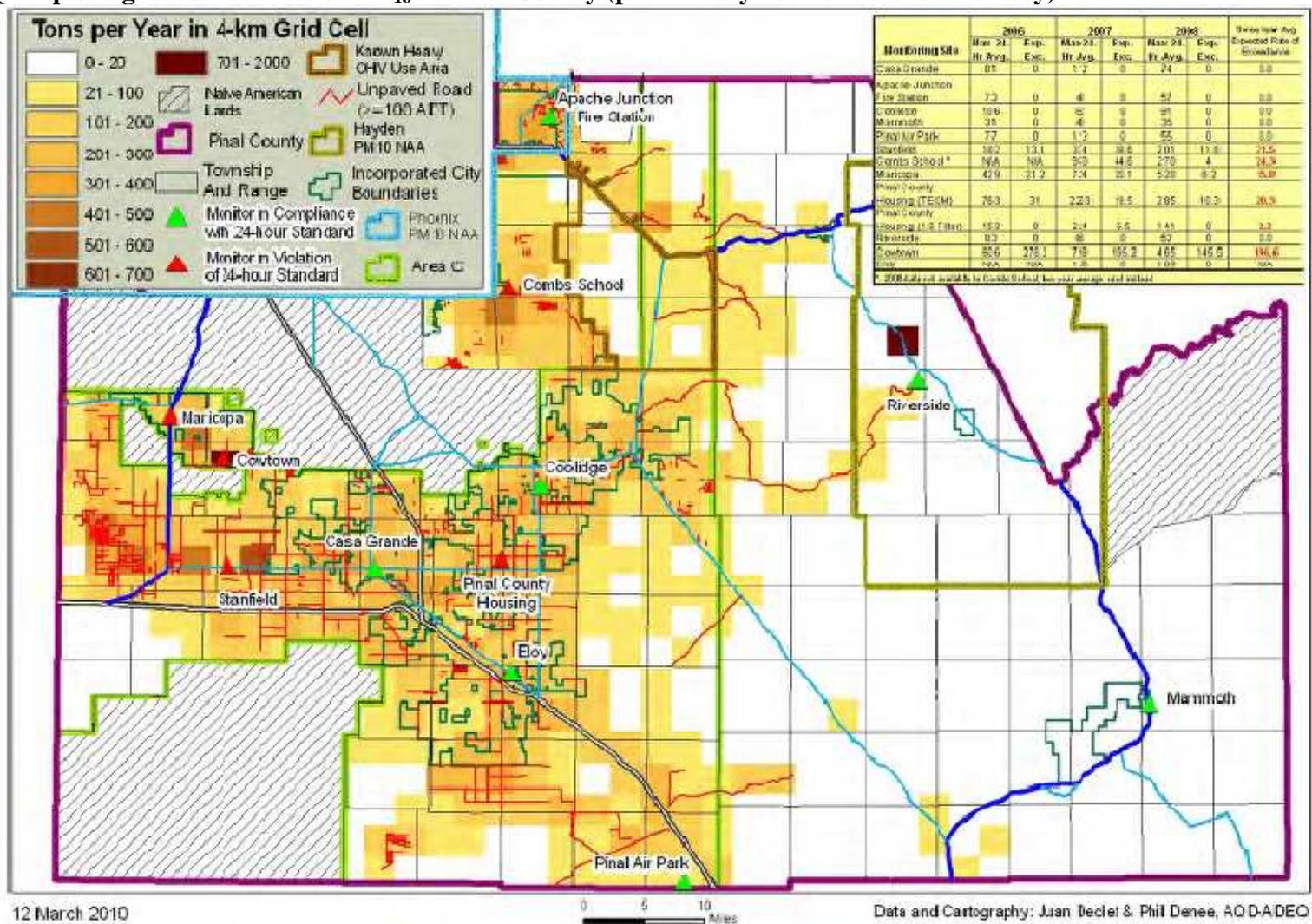
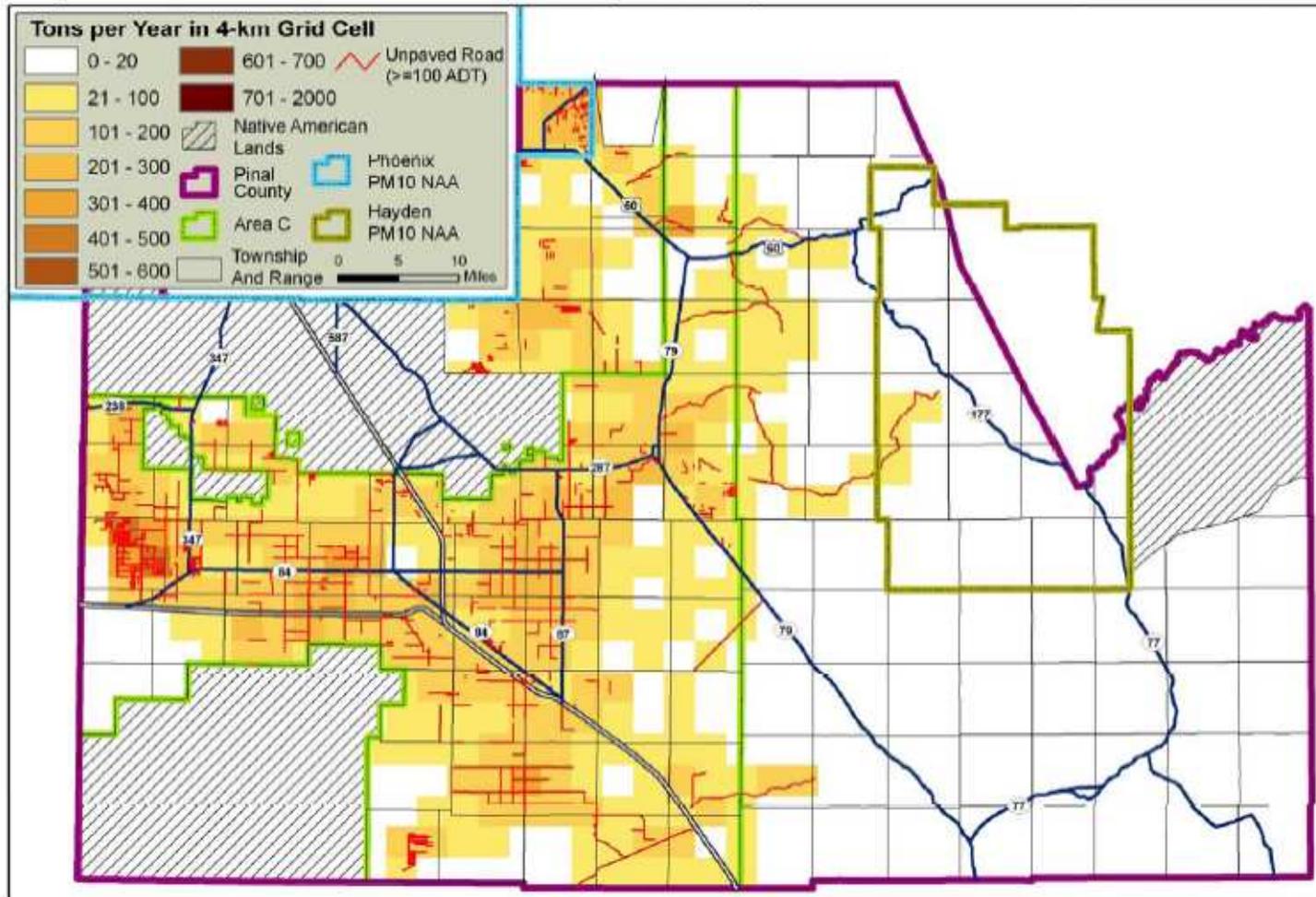


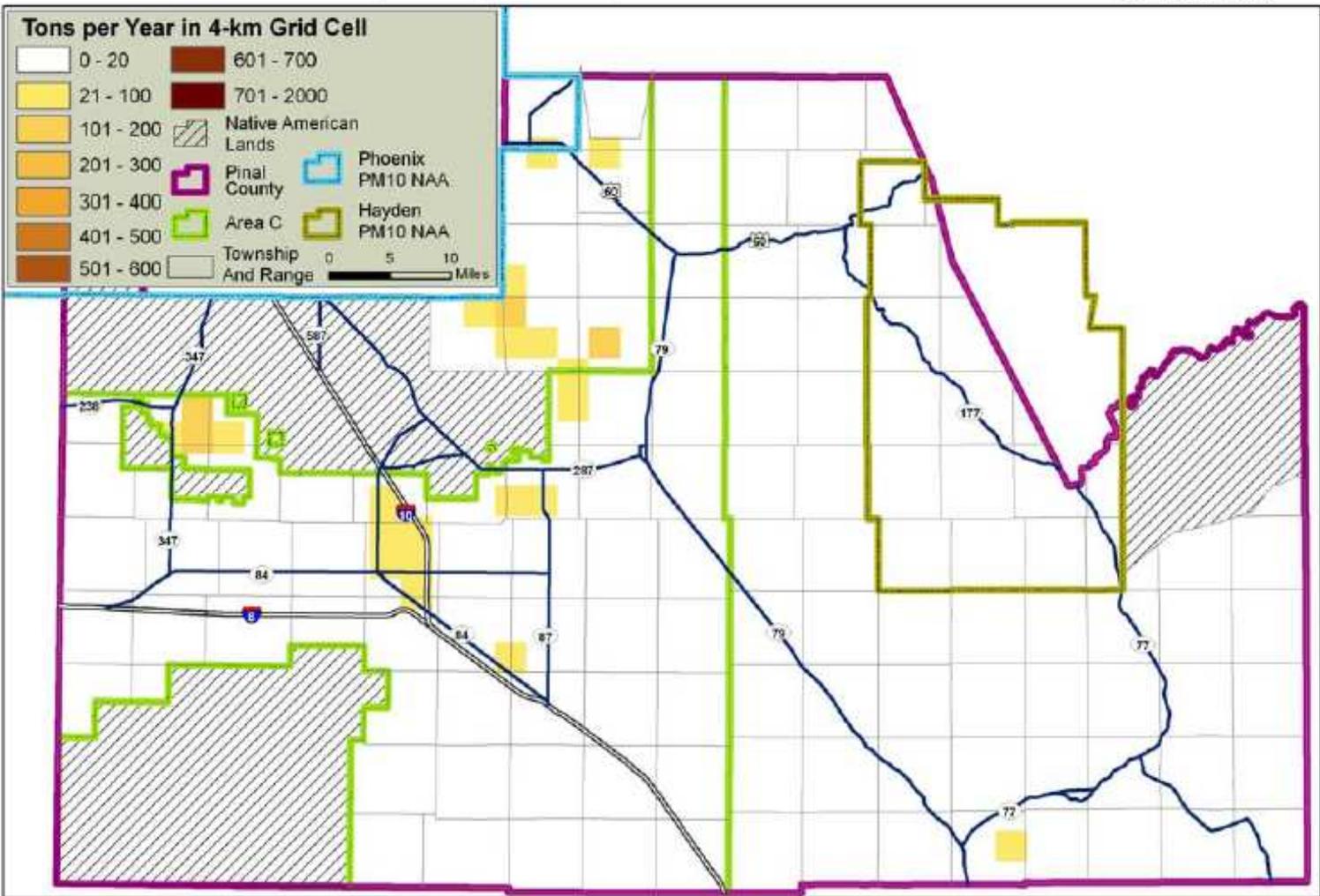
Figure 2. ADEQ Map of Onroad Emissions - Unpaved Roads (preliminary 2007 Emissions Inventory)



28 December 2009

Data and Cartography: Juan Declet & Phil Denee, AQD-ADEQ

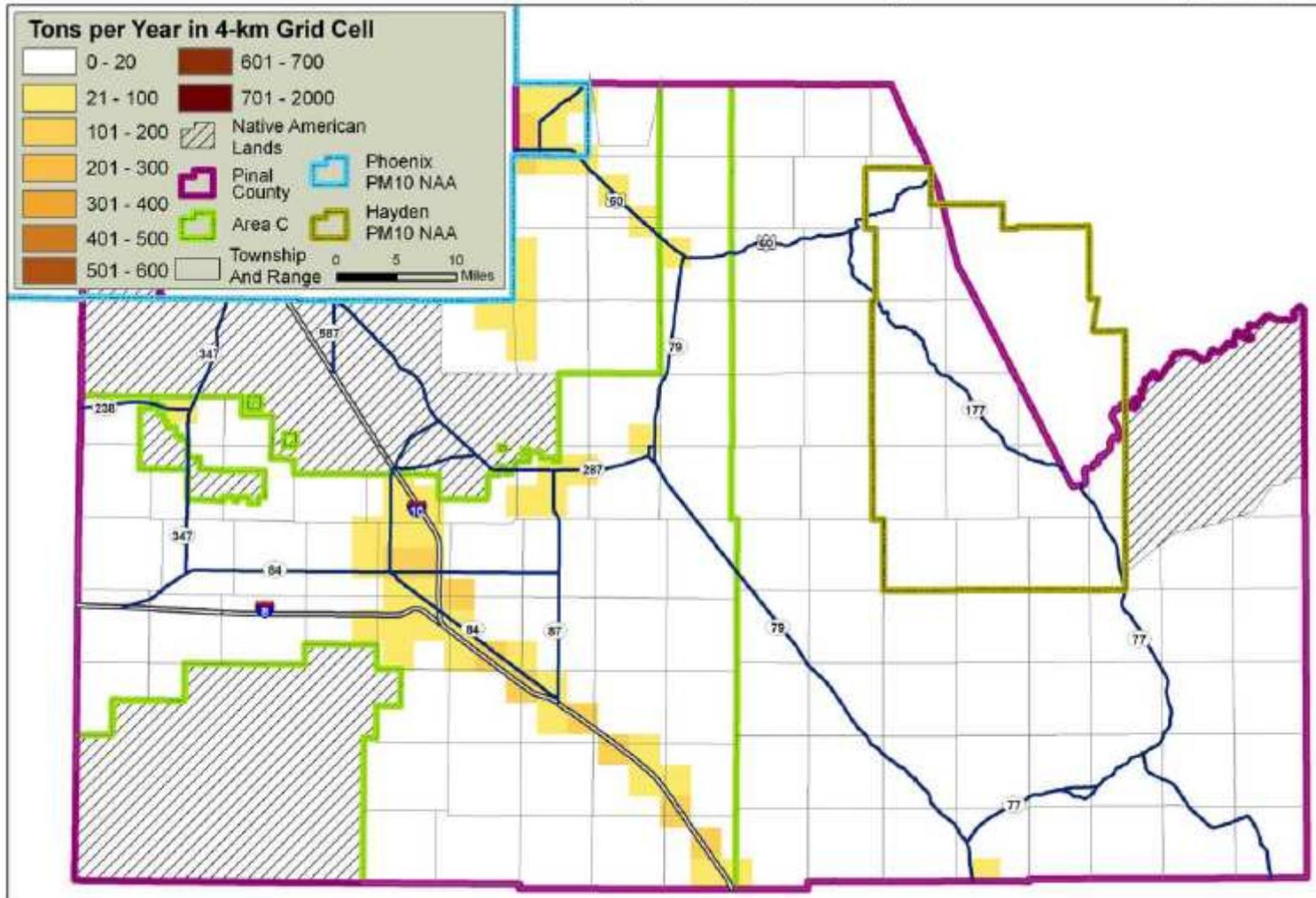
Figure 3. ADEQ Map of Construction Sources (preliminary 2007 Emissions Inventory)



23 December 2009

Data and Cartography: Juan Declet, Phil Denee, and Nancy Caroli, AQD-ADEQ

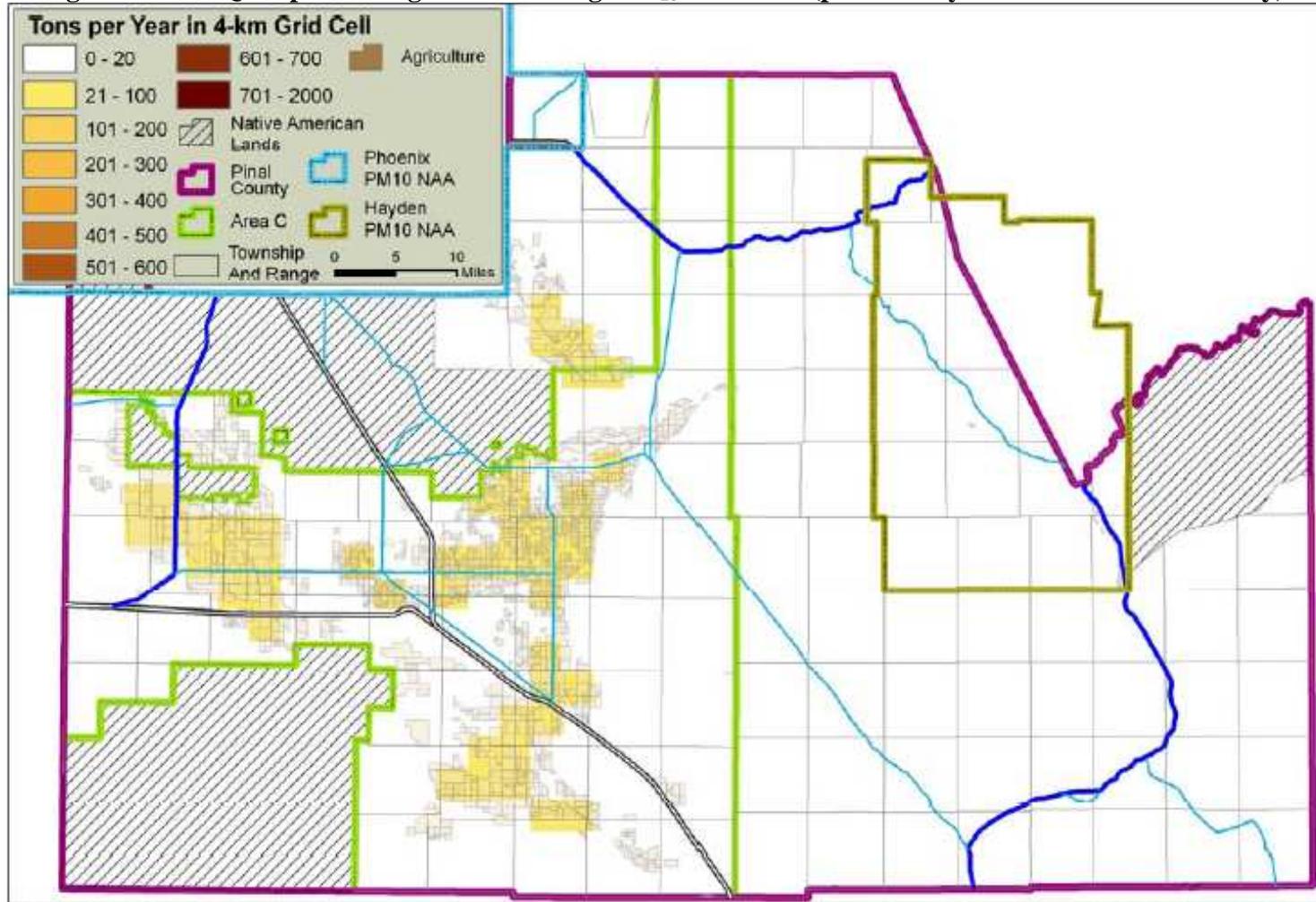
Figure 4. ADEQ Map of Onroad Emissions – Paved Roads (preliminary 2007 Emissions Inventory)



23 December 2009

Data and Cartography: Juan Declet, Phil Denee, and Nancy Caroll, AQD-ADEQ

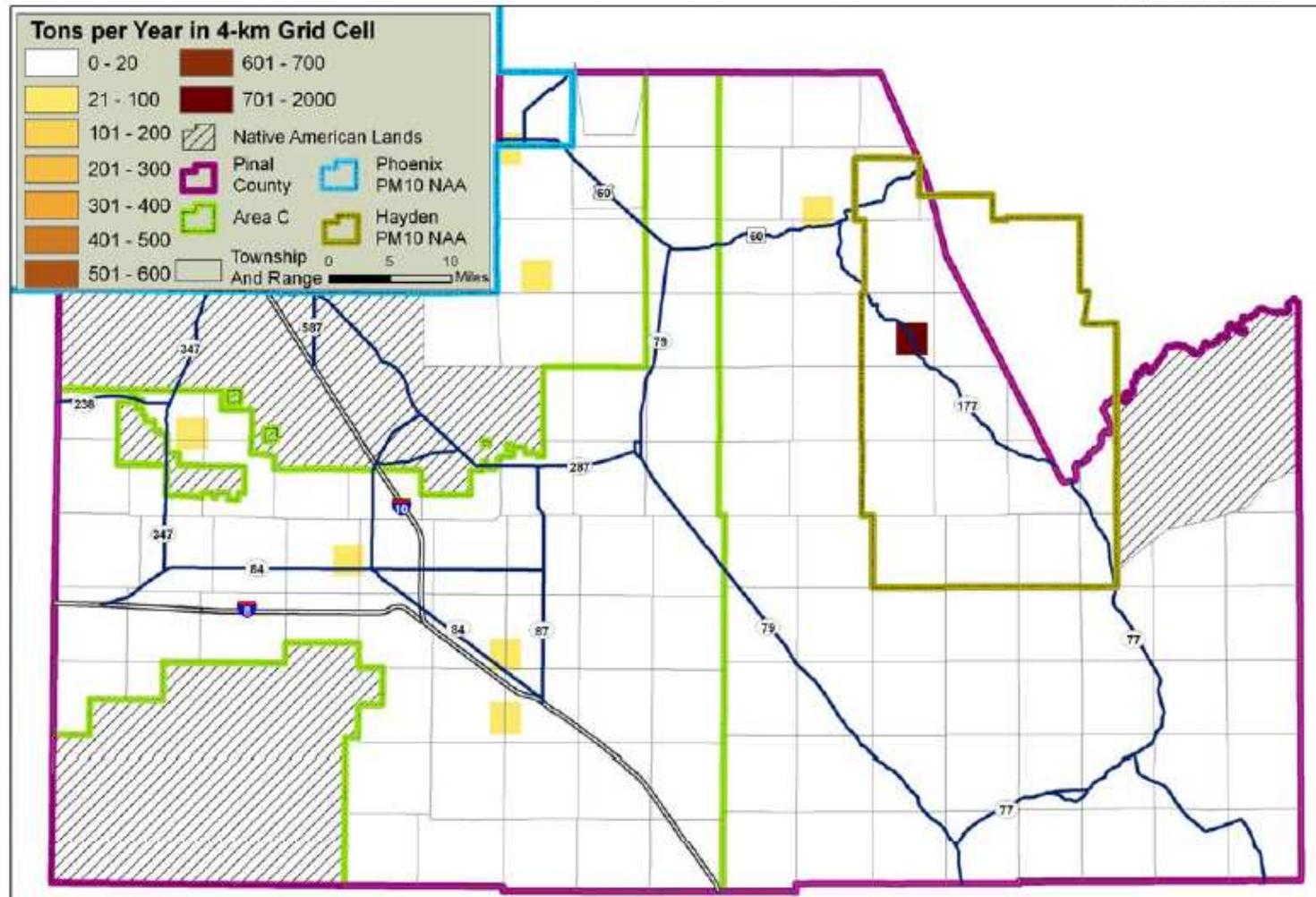
Figure 5. ADEQ Map of Tilling and Harvesing PM₁₀ Emissions (preliminary 2007 Emissions Inventory)



14 December 2009

Data and Cartography: Juan Declat & Phil Denee, AQD-ADEQ

Figure 6. ADEQ Map of Stationary Industrial Source PM₁₀ Emissions (preliminary 2007 Emissions Inventory)



23 December 2009

Data and Cartography: Juan Deplet, Phil Denee, and Nancy Caroli, AQD-ADEQ

Figure 7. ADEQ Map of Concentrated Animal Feeding Operation (CAFO) PM₁₀ Emissions. (preliminary 2007 Emissions Inventory)

