

Technical Support Document

PUERTO RICO Area Designations For the 2008 Lead National Ambient Air Quality Standards

EPA has set the level of the primary (health-based) standard at 0.15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) measured as total suspended particles (TSP). EPA has set the secondary (welfare-based) standard to be identical in all respects to the primary standard.

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as “nonattainment” those areas that violate the National Ambient Air Quality Standards (NAAQS) and those nearby areas that contribute to violations. The table below identifies the counties¹ or portions of counties in the Commonwealth of Puerto Rico that EPA intends to designate “nonattainment” for the 2008 lead national ambient air quality standard (2008 Lead NAAQS).

Table 1

Area	Puerto Rico Recommended Nonattainment County	EPA’s Designated Nonattainment County
Arecibo, Puerto Rico	N/A ²	Arecibo

Technical Analysis for Arecibo, Puerto Rico

Introduction

This technical analysis for the Arecibo, Puerto Rico Area identifies a monitor in Arecibo County that violates the 2008 Lead NAAQS and evaluates nearby counties for contributions to lead concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following factors recommended in previously issued EPA guidance:

- Air quality in potentially included versus excluded areas;
- Emissions and emissions-related data in areas potentially included versus excluded from the nonattainment area, including population data, growth rates and patterns and emissions controls;
- Meteorology (weather/transport patterns);
- Geography/topography (mountain ranges or other air basin boundaries);
- Jurisdictional boundaries (e.g., counties, air districts, reservations, etc.); and
- Any other relevant information submitted to or collected by EPA.

¹ For these purposes EPA considers the municipios of Puerto Rico to be equivalent to counties and for consistency and convenience will use the term “county.”

² Puerto Rico submitted a recommendation of “unclassifiable” for the Arecibo area and “unclassifiable/attainment” for the rest of the areas of Puerto Rico on October 14, 2009. Puerto Rico has not submitted any other recommendations based on 2010 air quality data.

Figure 1: Sources in Arcibo County, Puerto Rico

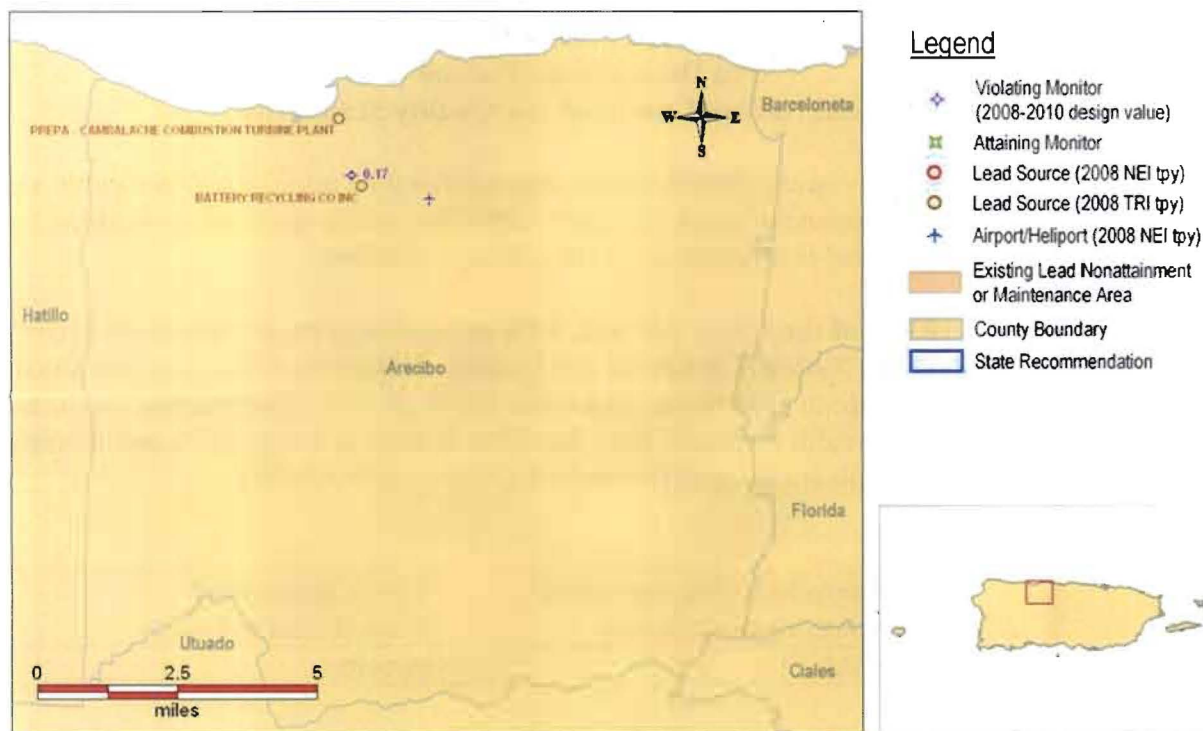


Figure 1 is a map of the area analyzed showing the location of the air quality violating monitor in the area, EPA’s recommended “nonattainment” boundary, and the counties surrounding the violating air quality monitor. The violating monitor is located in Arcibo County in close proximity to The Battery Recycling Company, shown in Figure 1.

On October 14, 2009, Pedro J. Nieves Miranda, Chairman of Puerto Rico Environmental Quality Board, recommended that San Juan be designated as attainment, the Arcibo area be designated unclassifiable, and for the rest of Puerto Rico be designated unclassifiable/attainment for the 2008 Lead NAAQS based on air quality data from 2006-2008. His recommendation was based on data from a Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor(s) located in the Commonwealth. EPA understands the recommendation for unclassifiable designation for the “Arcibo area” to refer to Arcibo County. EPA is revising Puerto Rico’s recommendation based on recent 2010 data from a Federal Reference Method or Federal Equivalent Method monitor that had been operated by the Commonwealth showing a violation of the 2008 Lead NAAQS. The revised recommendation is for the county which surrounds The Battery Recycling Company facility to be designated nonattainment. Thus, the boundary of the nonattainment area is consistent with the boundary recommended by the Governor as unclassifiable.

Based on EPA's technical analysis described below, EPA is intending to designate the entire Arcibo County in Puerto Rico as nonattainment for the 2008 Lead NAAQS as the Arcibo nonattainment area, based upon currently available information. This county is listed above in Table 1.

Detailed Assessment

Air Quality Data

This factor considers the lead design values (in $\mu\text{g}/\text{m}^3$) for air quality monitors in Arecibo County and the surrounding area based on data for the 2010 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 2008 Lead NAAQS are met at a monitoring site when the identified design value is valid and less than or equal to $0.15 \mu\text{g}/\text{m}^3$. A design value is only valid if minimum data completeness criteria are met. A lead design value that meets the NAAQS is generally considered valid if it encompasses 36 consecutive valid 3-month site means (specifically for a 3-year calendar period and the two previous months). For this purpose, a 3-month site mean is valid if valid data were obtained for at least 75 percent of the scheduled monitoring days in the 3-month period. A lead design value that does not meet the NAAQS is considered valid if at least one 3-month mean that meets the same 75 percent requirement is above the NAAQS. That is, a site does not have to monitor for three full calendar years in order to have a valid violating design value; a site could monitor just three months and still produce a valid (violating) design value.

The 2008 Lead NAAQS design values for Arecibo County and surrounding area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Monitor Name	Monitor Air Quality System ID	Monitor Location	Lead Design Value, 2007 – 2009 ³ ($\mu\text{g}/\text{m}^3$)	Lead Design Value, 2008 - 2010 ³ ($\mu\text{g}/\text{m}^3$)
Arecibo County, PR	No ⁴	Arecibo	720130001	Victor Santoni Cordero	N/A	0.245

Arecibo County shows a violation of the 2008 Lead NAAQS. Therefore some area in Arecibo County and possibly additional areas in surrounding counties must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status. Each area has been evaluated based on the weight of evidence of the eight factors collectively combined into five like groupings and other relevant information.

The violating monitor located in Arecibo County is located in close proximity to The Battery Recycling Company, Road No. 2 km 72.2 Barrio Cambalache in Arecibo, Puerto Rico. The monitoring objective, according to the EPA monitor locator report is "source-oriented". The

³ Note: Monitoring did not start at this site until January 1, 2010.

⁴ Governor recommended an unclassifiable designation for Arecibo prior to the measured violation. The monitor is within Arecibo County.

emissions from The Battery Recycling Company will be discussed in the corresponding section below.

Emissions and Emissions-Related Data

Evidence of lead emissions sources in the vicinity of a violating monitor are an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emission data for lead and any growth in lead emitting activities.

Emissions

Emissions data for industrial and airport sources (there are approximately 20,000 airport facilities in the U.S. at which leaded aviation gasoline is consumed) were initially derived from the 2008 National Emissions Inventory, version 1 (NEI08V1). See <http://www.epa.gov/ttn/chief/net/2008inventory.html#inventorydoc>. Puerto Rico has provided updated 2009 emissions inventory information for the industrial sources. These data are provided in Table 3. EPA recognizes that we have no information on any emissions increases that may have occurred since 2009. For example, certain large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2009.

Table 3 shows total emissions of lead sources emitting greater than 0.1 tons per year for the violating county according to the Puerto Rico 2009 Emissions Inventory. The airport located in Arecibo County emissions is less than 0.1 tons per year based on 2008 NEI emissions inventory, and therefore, is not included in this table. Potentially contributing counties in and around the Arecibo area were also evaluated. However, there are no industrial and airport sources emitting (or anticipated to contribute) greater than 0.1 ton per year of lead in neighboring counties.

Table 3. Lead Emissions [Puerto Rico 2009 Supplied]

County	Facility Located in Puerto Rico Recommended Nonattainment Area?	Facility – Total Air Emissions [Information Source] (tons per year)	Facility Location	Distance from monitoring site	Total County Lead Emissions (tons per year)
Arecibo County, PR	No ⁴	The Battery Recycling Company 1.22 tpy	Road No. 2, km 72.2, Barrio Cambalache, Arecibo	388 meters	1.385 tpy
		PREPA Cambalache Combustion Turbine Plant 0.165 tpy	PR 681, km 0.5, Arecibo	1.5 kilometers	

Population Data, Growth Rates, and Patterns

Table 4 shows the 2008 population for the county being evaluated. These data help assess the extent to which the concentration of human activities in the area and concentration of population-oriented commercial development may indicate emissions-based activity contributing to elevated ambient lead levels. This may include ambient lead contributions from activities that would disturb lead that has been deposited on the ground or on other surfaces. Re-entrainment of historically deposited lead typically is not reflected in the emissions inventory.

Table 4. Population Data

County	State Recommended Nonattainment?	2008 Population	2008 Population Density (pop/sq mi)	Population Change 2000-2008	Population % Change 2000-2008
Arecibo County, Puerto Rico	No ⁴	102,643	801	2,273	2

Source of data: U.S. Census Bureau estimates for 2008 (<http://www.census.gov/popest/datasets.html>) and estimation of the area of U.S. Counties.

EPA has considered the population growth rate for this area and determined it does not affect EPA's proposed nonattainment boundary.

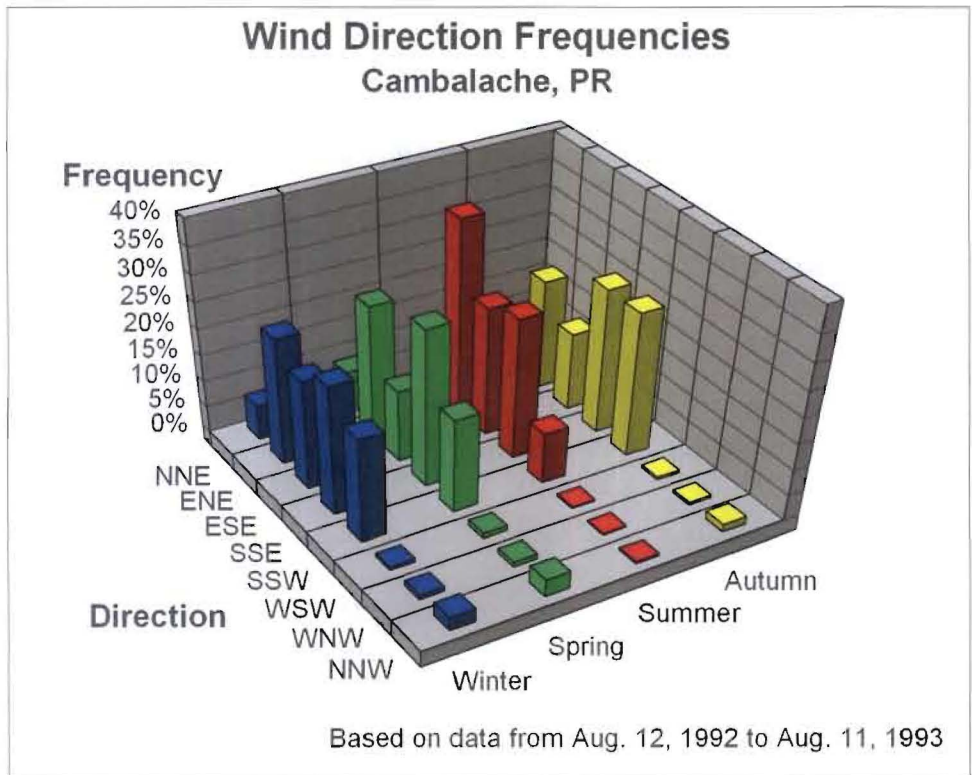
Emissions Controls

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 3 represent emissions levels taking into account any control strategies implemented on stationary sources in the Arecibo area before 2008. PREPA is an electric power company that provides minimum lead emissions in its operations. EPA has not received any additional information on emissions reductions resulting from controls put into place since 2008. The Battery Recycling Company is currently using one baghouse with an efficiency of 99.5% for its lead smelting furnace and five molten lead refining kettle burners. The PREPA Cambalache facility is currently not using any control equipment for lead emissions for its three gas turbines.

Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind speed and direction were analyzed from August 1992 to August 1993 for a meteorological site located in Cambalache, PR.

Figure 2: Historic Wind Direction Frequency in each of Four Seasons for Arecibo County, Puerto Rico



As seen in Figure 2 above, on months with the highest observed lead levels, the prevailing surface winds were predominantly from the Northeast/Southeast.

Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of lead over the Arecibo Area. The Arecibo Area does appear to have southern geographical and topographical barriers which may limit air-pollution transport within its air shed. However, Puerto Rico did not recommend a boundary smaller than the county or provide information to support such a boundary.

Jurisdictional boundaries

Existing jurisdictional boundaries may be helpful in articulating a boundary for purposes of nonattainment designations, and for purposes of carrying out the governmental responsibilities of planning for attainment of the lead NAAQS and implementing control measures. These existing boundaries may include an existing nonattainment or maintenance area boundary, a county or township boundary, a metropolitan area boundary, an air management district, or an urban planning boundary established for coordinating business development or transportation activities. In light of EPA’s existing guidance on beginning the boundary analysis for nonattainment areas with county boundaries, and the Governor’s recommendation with regard to boundaries for an unclassifiable area, this was a significant factor in determining the nonattainment boundary.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, EPA has preliminarily determined that it is appropriate to include Arecibo County in the Puerto Rico nonattainment area for the 2008 Lead NAAQS.

EPA based this preliminary nonattainment designation determination and boundary on the fact that Arecibo County contains an air quality monitor that shows a violation of the 2008 Lead NAAQS, based on 2010 air quality data. The Battery Recycling Company facility is the largest emissions source located upwind of the violating monitor, and EPA believes this facility caused and/or contributed to the violating monitor during the period.

Based on its considerations of all the relevant, available information, as described above, EPA believes that the boundaries described herein encompass the entire area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2008 Lead NAAQS.

Definition of important terms used in this document:

- 1) **Designated “nonattainment” area** – an area which EPA has determined, based on a State recommendation and/or on the technical analysis included in this document, has violated the 2008 Lead NAAQS, based on the most recent three years of quality assured air quality monitoring data from 2008-2010 including at least one valid three-month site mean above the level of the 2008 Lead NAAQS, or that contributes to a violation in a nearby area.
- 2) **Designated “unclassifiable/attainment” area** – an area which EPA has determined does not contribute to a violation of the 2008 Lead NAAQS in a nearby area and either: (1) meets the 2008 Lead NAAQS, based on the most recent three years of quality assured air quality monitoring data from 2008-2010 including 36 consecutive valid three-month site means (including the last two months of 2007), or (2) has no monitors or has incomplete air quality monitoring data for 2008-2010 but has no violations of the 2008 Lead NAAQS.
- 3) **Designated “unclassifiable” area** – an area which EPA has determined cannot be classified on the basis of available information as meeting or violating the 2008 Lead NAAQS, based on the most recent three years of quality assured air quality monitoring data from 2008-2010, but for which available monitoring data from the same or a recent period indicate a significant likelihood that the area may be violating the 2008 Lead NAAQS.
- 4) **Prior nonattainment area** – an area that was previously designated as nonattainment for the 1978 Lead Standard (including both current nonattainment areas and maintenance areas).
- 5) **Recommended nonattainment area** – an area a State or Tribe has recommended to EPA be designated as nonattainment.
- 6) **Violating monitor** – an ambient air monitor whose valid design value exceeds 0.15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). As described in Appendix R of part 50, a violation can be based on either Pb-TSP or Pb- PM_{10} data and only three months of data are necessary to produce a valid violating design value.
- 7) **1978 Lead NAAQS** – $1.5 \mu\text{g}/\text{m}^3$, National Ambient Air Quality Standard for lead promulgated in 1978. Based on Pb-TSP indicator and averaged over a calendar quarter.
- 8) **2008 Lead NAAQS** - $0.15 \mu\text{g}/\text{m}^3$, National Ambient Air Quality Standard for lead promulgated in 2008. Based on Pb-TSP indicator and a three-month rolling average. Pb- PM_{10} data may be used in limited instances, including to show nonattainment.