EPA United States Environmental Protection Agency

Proposed National Ambient Air Quality Standards for Lead

Overview

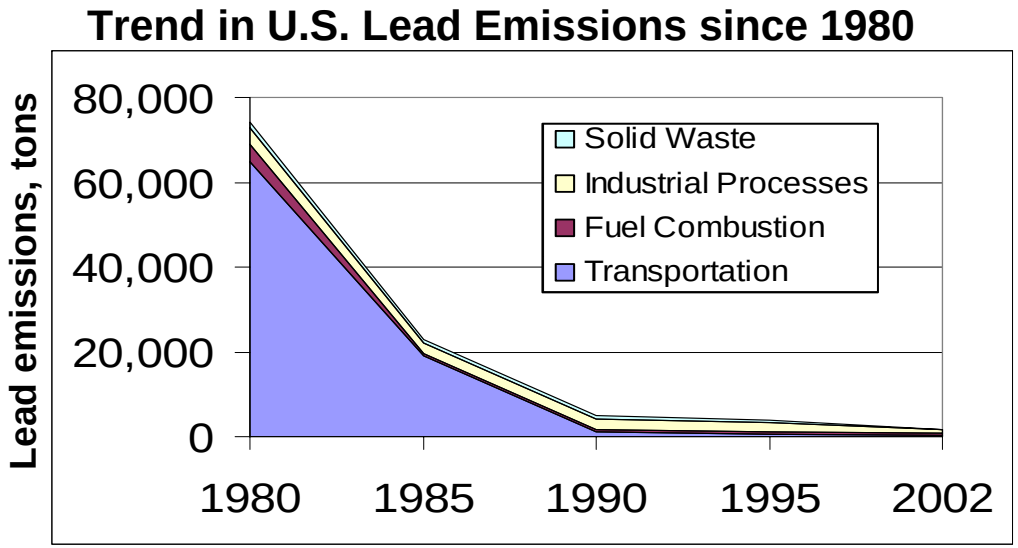
- On May 1, 2008, EPA proposed to strengthen the national ambient air quality standards (NAAQS) for lead (Pb) to increase protection of public health and the environment
  - Since 1978, ambient air lead standards have been set at 1.5 $\mu g/m^3$ (micrograms per cubic meter of air)
  - Now, EPA is proposing to strengthen the standards to a level between **0.10-0.30 $\mu g/m^3$**
  - The level is based on the concentration of lead in total suspended particles (TSP)
  - EPA also proposes corresponding changes to the lead monitoring network to ensure monitors are assessing air quality in all areas that might violate the new standards
- A public comment period for this proposal will end **August 4, 2008**
- On June 12, 2008, EPA hosted public hearings on this proposal in St. Louis and Baltimore
- For more information go to http://www.epa.gov/air/lead/

Basic Information About Lead Air Pollution

- Lead is a metal found naturally in the environment as well as in manufactured products
- Lead can be emitted into the air in the form of particles small enough to stay suspended in the air
- EPA measures lead air pollution with monitors that capture all of those suspended particles, known as total suspended particles or TSP
- Lead emitted into the air can be inhaled directly or ingested after it settles onto surfaces or soils
  - Ingestion is the main route of human exposure
- Once in the body, lead is rapidly absorbed into the bloodstream and can affect many of the body's organ systems
  - Exposures to low levels of lead early in life have been linked to effects on IQ, learning, memory, and behavior

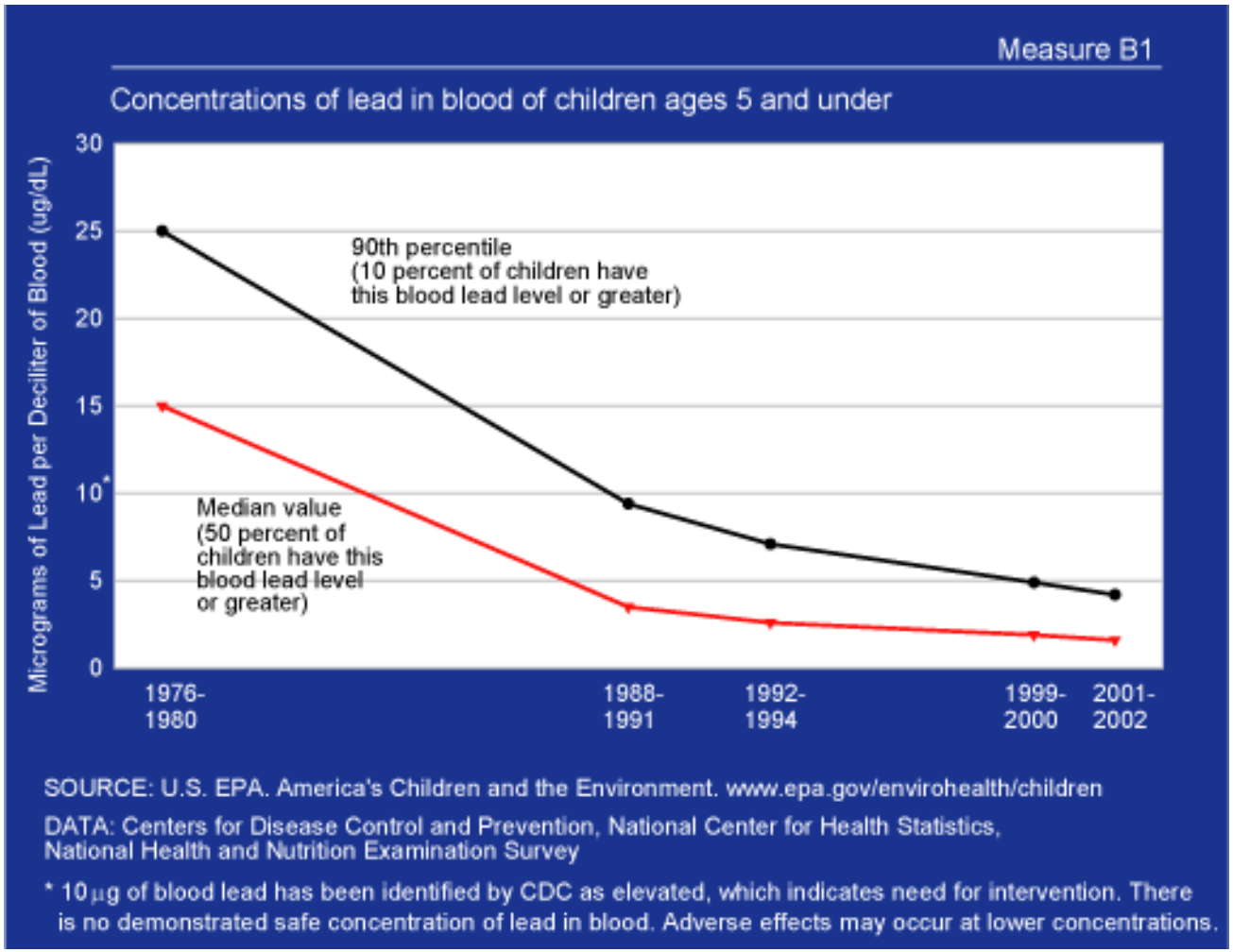
Reduction in Lead Pollution in the U.S.

- As a result of the permanent phase-out of leaded gasoline, controls on emissions of lead compounds through EPA's air toxics program, and other national and state regulations, airborne lead concentrations in the U.S. have decreased 94 percent since 1980



- Lead is also regulated through other EPA programs including:
  - Standards for lead-based paint hazards and lead dust cleanup in most pre-1978 housing and child-occupied facilities (such as daycare centers)
  - Standards for managing lead in solid and hazardous waste
  - Requirements for cleanup of lead contamination at Superfund sites
  - Standards for lead in drinking water
- In addition, the Agency's Lead Awareness Program works to protect human health and the environment by making people aware of the dangers of lead pollution

Changes in Children's Blood Lead Levels Since 1978



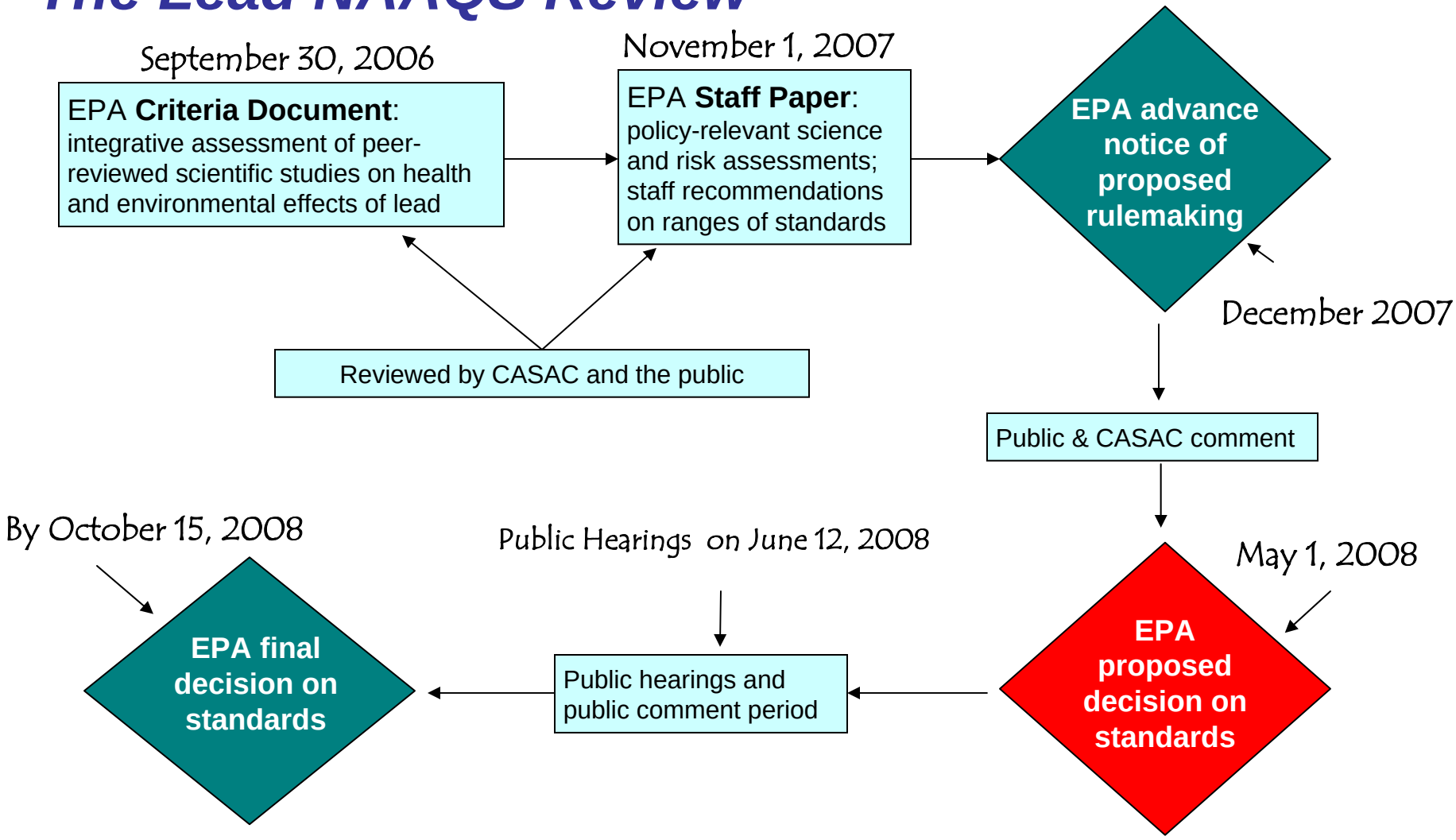
- Concentrations of lead in children's blood have dropped significantly, from a median level of 15 µg/dL in the late 1970s to less than 2 µg/dL today

Sources Contributing to Lead Pollution

- More than 1,300 tons of lead are still emitted each year from about 16,000 sources, many of which emit a fraction of a ton
- The highest levels of lead in air are generally found near lead smelters
- Other sources of current lead emissions include:
  - Iron and steel foundries
  - Copper Smelting
  - Metal mining
  - Industrial/commercial/utility boilers
  - Gasoline for small planes
    (not used in commercial passenger aircraft)
  - Waste incinerators
  - Cement manufacturing
  - Glass manufacturing

- Lead particles emitted into the air from these and other sources can end up in water, soil and dust, and over time can re-enter the air
- This cycling of lead in the environment means people can be exposed to lead that was emitted just yesterday or years ago

The Lead NAAQS Review



Clean Air Science Advisory Council (CASAC) Advice and Recommendations

- Current standards of 1.5 µg/m^3 quarterly average are not adequate to protect public health and welfare
- EPA should substantially strengthen the primary lead NAAQS to a level no higher than 0.2 µg/m^3
- EPA should revise the averaging time from quarterly to monthly
- The secondary standard should be revised to a level at least as low as that recommended for the revised primary standard
- EPA should transition to measuring lead particles with PM_{10} monitors (as opposed to TSP monitors) for quantifying ambient lead concentrations, taking into account that fewer lead particles are captured by a PM_{10} monitor

Proposed Revisions to the Lead Standards: Level

- EPA proposes to strengthen the primary standard from 1.5μg/m^3 to a level within the range of 0.10-0.30 μg/m^3
- EPA is requesting comment on alternative levels for the primary lead standard as high as 0.50 μg/m^3 and down to levels below 0.10 μg/m^3
- EPA also invites comment on when, if ever, it would be appropriate to set a NAAQS for lead at a level of zero
- EPA is proposing to make the secondary standard identical to the proposed primary standard

Proposed Revisions to the Lead Standards: Averaging Time and Form

- EPA is also proposing to revise the averaging time and form used to determine whether an area meets the standard, and has proposed two alternatives:
  - Retain the current form of a maximum (not-to-be-exceeded) quarterly average and evaluate whether an area meets the standard using 3 years (12 quarters) of data ("max quarterly")
  - Shift to a monthly averaging time and evaluate whether an area meets the standard using the second highest monthly average over 3 years ("2nd max monthly")

Proposed Revisions to the Lead Standards: Indicator

- EPA is proposing to retain the current indicator based on measuring lead in the air using total suspended particles (TSP) monitors
  - EPA's traditional approach of measuring lead in TSP reflects evidence that all lead particles, regardless of size, pose health risks.
- EPA is considering whether to allow the use of PM_{10} monitoring data to determine compliance with the proposed TSP standard
  - PM_{10} monitors, by design, do not capture particles larger than 10 micrometers in diameter
  - However, many of the lead particles measured in TSP are 10 micrometers or less in diameter, and PM_{10} monitors are more precise than TSP monitors
  - EPA is considering whether it would be appropriate to adjust lead PM_{10} data for use in comparison to a TSP-based standard, and if so, how to make those adjustments
    - EPA proposing to allow states to establish site-specific scaling factors for purposes of adjusting PM_{10} data based on data from co-located monitors
    - EPA taking comment on establishing default scaling factors
- EPA is also requesting comment on the alternative approach of basing the level of the standard on the concentration of lead in PM_{10}

Proposed Revisions to the Lead Monitoring Requirements

- The current monitoring network is inadequate to assess national compliance with the proposed revised lead standards
- EPA proposes to improve the lead monitoring network by focusing on sources of lead emissions such as smelters, metallurgical operations, battery manufacturers, fugitive dust sources (e.g., mine tailings piles) and airports
  - EPA proposes to require monitors near all sources that exceed an emission threshold of between 200 and 600 kilograms (441 and 1,323 pounds) per year, depending on the stringency of the standard
    - Requirement may be waived for sources emitting less than 1,000 kilograms (2,200 pounds) of lead per year through demonstration that ambient levels will not exceed 50% of the lead NAAQS
  - Depending on the number of new monitors that are necessary, either all will be required to be operational by January 1, 2010, or half of the new monitors will be required to be operational by January 1, 2010, with the other half operational by January 1, 2011

Proposed Revisions to the Lead Monitoring Requirements (Cont.)

- EPA also proposes to require monitors in urban areas with populations greater than 1 million
- EPA proposes changes to sampling and analysis methods (including quality assurance requirements), sampling schedule, data reporting and other miscellaneous requirements
  - If averaging time of the standard is set at monthly as opposed to quarterly, the sampling schedule is proposed to change from 1 in 6 days to 1 in 3 days.
  - EPA has proposed a Pb-PM_{10} FRM in case the final standard is set in Pb-PM_{10}. The analysis method for this FRM is proposed to be X-Ray Fluorescence, which is currently used in the $PM_{2.5}$ Speciation Network
  - Also, the proposed Pb-PM10 FRM is a low volume PM_{10} sampler

Anticipated Timeline For Revised Lead NAAQS

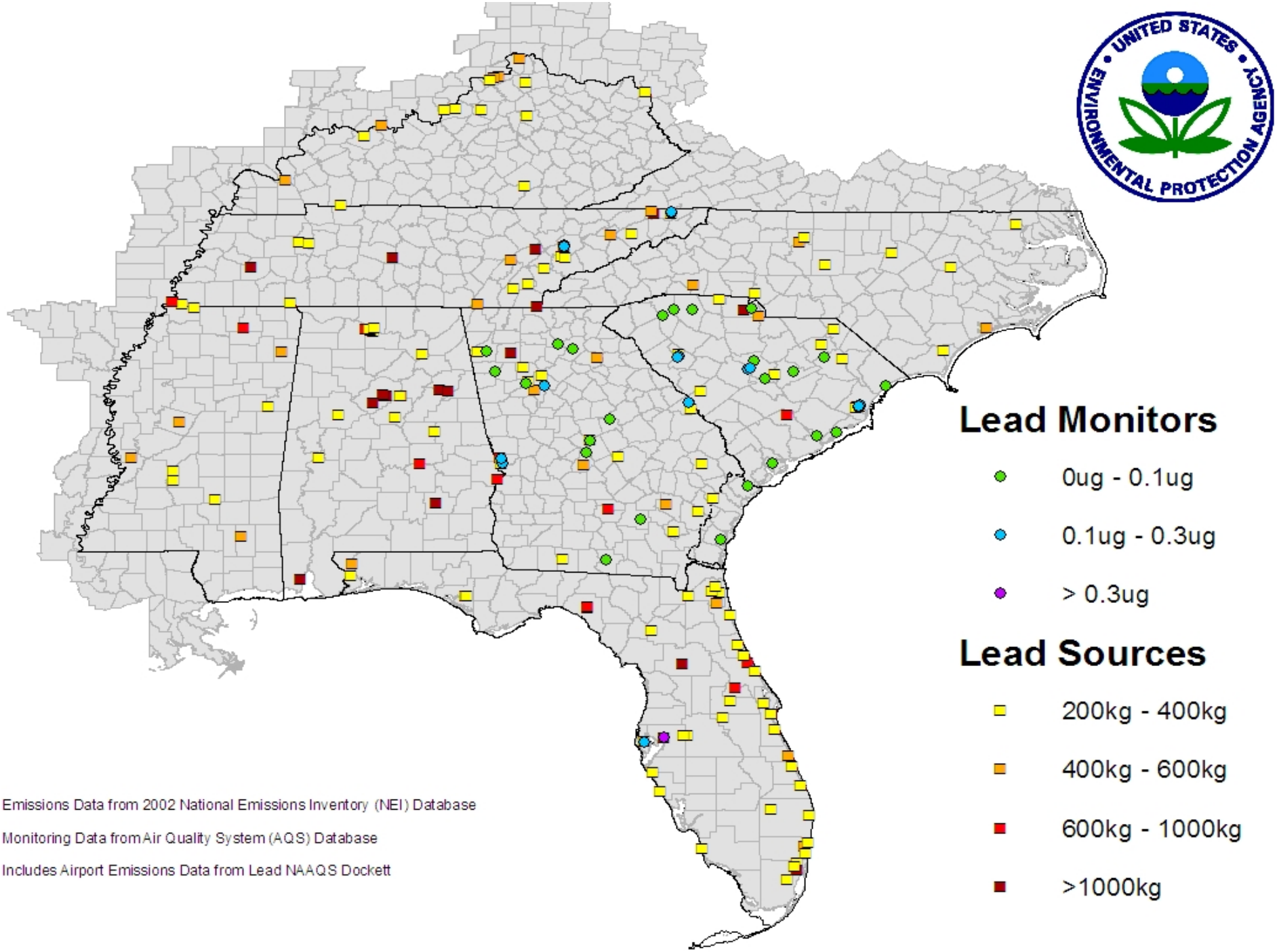
Milestone	Date
Signature—Final Rule	**October 15, 2008**
State Designation Recommendations to EPA	No later than **October** 2009 (based on 2006-2008 data)
Monitoring Network	Operational by January 1, 2010* *If a large number of new monitors are necessary, half of the new monitors must be operational by January 1, 2010, with the other half operational by January 1, 2011
Final Designations Signature	No later than **October** 2011
Attainment Demonstration SIPs Due	No later than Spring 2013
Attainment Date	No later than Fall 2016

Monitoring Implications for Region 4

- Four states currently not operating any lead monitors
- Number of monitors required will depend on the level of the final standard

If the standard is set at…	**Monitoring will be required for sources with emissions above…**	**And the number of required source monitors in Region 4 will be…[1]**
0.3µg/m^3	600 kg/year	32
0.2µg/m^3	400 kg/year	59
0.1µg/m^3	200 kg/year	158

[1] Based on data from 2002 NEI


Lead Monitors
0ug - 0.1ug
0.1ug - 0.3ug
> 0.3ug
Lead Sources
200kg - 400kg
400kg - 600kg
600kg - 1000kg
>1000kg
Emissions Data from 2002 National Emissions Inventory (NEI) Database
Monitoring Data from Air Quality System (AQS) Database
Includes Airport Emissions Data from Lead NAAQS Dockett