

# Improving Air Quality: Particles

## Metropolitan Washington Region Air Quality Plan



THE METROPOLITAN WASHINGTON AIR QUALITY COMMITTEE IS DEVELOPING A PLAN THAT IS MORE AGGRESSIVE THAN REQUIRED BY THE NATIONAL AIR QUALITY STANDARDS FOR FINE PARTICLES, IN ORDER TO IMPROVE THE REGION'S AIR QUALITY AND BE MORE PROTECTIVE OF PUBLIC HEALTH.

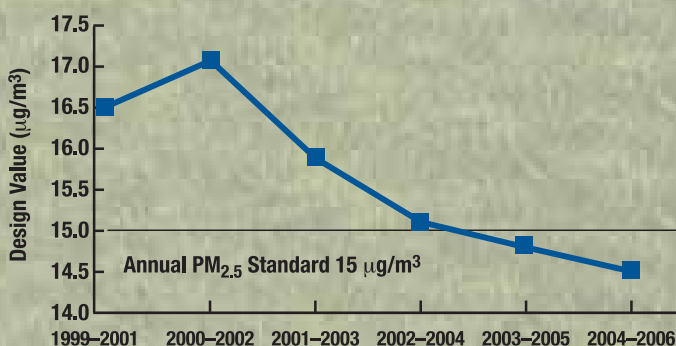
### Metropolitan Region Air Quality Plan

States are required to monitor air to ensure compliance with the U.S. Environmental Protection Agency's (EPA's) national air quality standards. A region with air containing more pollution than the standards permit is a "nonattainment area." The Clean Air Act sets deadlines for meeting the air quality standards, the timing of which depends upon the severity of the region's pollution. Each nonattainment area must prepare a State Implementation Plan (SIP) to show how it will meet the standards by the EPA deadline.

Fine particles—or soot—are a mixture of microscopic solid and liquid particles suspended in the air. The finest particulate matter, called  $PM_{2.5}$ , has a diameter of 2.5 micrometers or less. These particles may penetrate deep into the lungs and even into the bloodstream, causing asthma and other respiratory effects, and potentially serious cardiovascular problems.

To protect public health, in 1997 EPA adopted  $PM_{2.5}$  standards—an annual average standard of 15 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and a daily average standard of 65  $\mu\text{g}/\text{m}^3$ . Upon analyzing ambient monitoring data for the Washington region, in 2005 EPA designated the region as a nonattainment area for  $PM_{2.5}$  and required it to submit a SIP by April 2008. Although recent data for 2005 and 2006 show the region's PM levels are meeting the national standard, the Metropolitan Washington Air Quality Committee is preparing a SIP that will guarantee more protection than required by the national standard.

Annual  $PM_{2.5}$  Design Value in the Washington Region



Note: Design Value = 3-year average of the 4th highest 8-hour maximum  $PM_{2.5}$  concentration. Data for 2004-2006 are preliminary.

#### Metropolitan Washington Air Quality Committee

MWAQC is the regional air quality planning committee, consisting of elected officials from 21 cities and counties in the Washington nonattainment area, plus representatives from state legislatures, air agencies, and transportation agencies. MWAQC has primary responsibility for developing SIPs to achieve the air quality standard for ozone and fine particles.

*Recent data for 2005 and 2006 show the Washington region's PM levels are meeting the national annual average particle standard of 15  $\mu\text{g}/\text{m}^3$ .*



## Elements of Air Quality Plans

A SIP must contain an inventory of all man-made emissions in the region, an estimate of the quantity of emissions allowed under the air quality standard, a plan for reducing emissions to that level, and a plan for additional “contingency” reductions, to be implemented if the region fails to meet its attainment deadline. The region must also demonstrate that it considered all reasonably available emission control measures during the design of its air quality plan.

## Emission Inventories

EPA’s  $PM_{2.5}$  implementation rule requires state air agencies to determine the significance of  $PM_{2.5}$  pollutants/precursors, including motor vehicle emissions. EPA guidance notes that particulate matter and the precursors nitrogen oxide ( $NO_x$ ) and sulfur dioxide ( $SO_2$ ) are significant for SIP planning purposes.

The region’s new plan contains an accounting of  $SO_2$ ,  $NO_x$ , and  $PM_{2.5}$  emissions, starting with a 2002 baseline inventory and continuing through 2009, EPA’s deadline year. The 2002–2009 inventories include emissions from four source categories: point, on-road, non-road, and area sources. Because overall emissions are directly related to the number of people living and working in the region, future inventories will be calculated using population, household, and employment data.

## Federal and State Control Measures

More than 100 federal and state control measures have been or will be adopted to improve the Washington region’s air quality. The primary control measure expected to bring the region further into attainment of the annual  $PM_{2.5}$  standard is the Clean Air Interstate Rule (CAIR). EPA promulgated the CAIR in 2005, requiring states to reduce PM direct emissions from large fossil fuel-fired electric-generating units. The rule requires power plants to limit their  $NO_x$  and  $SO_2$  emissions to their state allocations, either through emission controls or through banking and trading. Maryland, Virginia, and the District of Columbia have adopted CAIR regulations that cap  $NO_x$  and  $SO_2$  emissions, but prohibit trading of allowances in order to maximize local reductions from power plants.

In addition, several required and voluntary federal and state measures controlling emissions from point, on-road, non-road, and area sources are continuing to enhance the region's air quality:

**Point Sources**

- CAIR power plant controls to reduce smokestack SO<sub>2</sub> and NO<sub>x</sub> emissions

**On-road Sources (Cars, Trucks, Buses)**

- Inspection and maintenance programs for vehicle emission systems
- Cleaner-burning gasoline
- Low-sulfur diesel fuel
- National controls requiring cleaner engines on all new cars, SUVs, and heavy-duty trucks

**Non-road Sources**

- National standards for locomotive engines
- National standards for marine diesel engines
- National standards for cleaner heavy-duty engines

**Area Sources**

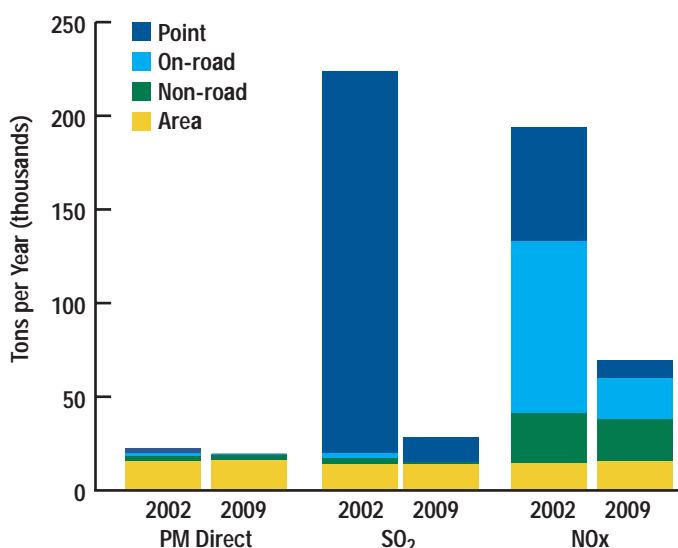
- Reformulated consumer products—aerosols, portable fuels, and adhesives—to reduce vapors
- Open-burning restrictions
- Fugitive construction dust control



**State and Local Government Initiatives**

The region's new air quality plan contains a group of innovative, nonregulatory programs developed and funded by state and local governments. These programs focus on reducing local emissions by purchasing low-emission and renewable-energy vehicles, retrofitting diesel school and transit buses to run on biodiesel fuels, implementing truck-idling guidelines, constructing green buildings, and using low-emission paint. In addition, local governments are adopting energy efficiency initiatives that produce air quality benefits beyond the plan's 2009 horizon, setting the stage for future emission reduction strategies.

Planned PM Decreases in the Washington Region



Sources: Mid-Atlantic Regional Air Management Association and Visibility Improvement State and Tribal Association of the Southeast.





## Transportation

The region's proposed SIP will establish motor vehicle emission budgets for fine particles ("PM direct") and the precursor NO<sub>x</sub> only. State air agencies, in consultation with state transportation agencies, have determined that volatile organic compounds and ammonia are not significant precursors for SIP planning purposes.

While SO<sub>2</sub> is a significant precursor for SIP planning purposes, the region has decided that a motor vehicle emission budget for SO<sub>2</sub> is not required because on-road emissions of SO<sub>2</sub> are not a significant source of total overall SO<sub>2</sub> precursor emissions in the region, and existing controls are expected to substantially mitigate future on-road emissions of SO<sub>2</sub>. These determinations are consistent with the Transportation Planning Board's current scope of work for analyzing regional emissions and demonstrating compliance with national PM<sub>2.5</sub> standards.

## Next Steps

Maryland, Virginia, and the District of Columbia will submit the new regional air quality plan to EPA in the spring of 2008. Once EPA verifies that the plan is technically correct and meets all Clean Air Act

requirements, it will issue an official rulemaking approving the plan. EPA will also conduct a separate review of the mobile emissions budget to determine whether it is consistent with the goal of attaining the national annual PM<sub>2.5</sub> standard. EPA is expected to complete the rulemaking process in 2009. The Metropolitan Washington Air Quality Committee will periodically revisit the plan to review its assumptions and determine if the region is still on course to meet the national annual PM<sub>2.5</sub> standard.

## Regional Air Quality Contacts

MWAQC [www.mwcog.org/environment/air](http://www.mwcog.org/environment/air)

District of Columbia Department of Environment [www.ddoe.dc.gov](http://www.ddoe.dc.gov)

Maryland Department of the Environment [www.mde.state.md.us](http://www.mde.state.md.us)

Virginia Department of Environmental Quality [www.deq.virginia.us](http://www.deq.virginia.us)

Clean Air Partners [www.cleanairpartners.net](http://www.cleanairpartners.net)

Air Quality Hotline 202-962-3299

Real-Time Air Quality Data [www.air-watch.net](http://www.air-watch.net)

Alternative formats of this publication can be made available for persons with disabilities.

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