

## 6.0 **PM<sub>2.5</sub> REVIEW: MONITORING ACTIVITIES IN THE UNITED STATES AND CANADA**

As mentioned earlier in this report and in several preceding International Air Quality Advisory Board reports, fine particulate (PM<sub>2.5</sub>) is a transboundary pollutant which has an deleterious impact on human health. Sulfates and nitrates formed from acid gas emissions constitute a significant proportion of fine particulate. Both the United States and Canada have recognized the need to further determine prevailing concentrations of this pollutant to allow for development of appropriate source control actions.

In mid-1997, the United States Environmental Protection Agency (USEPA) published a Final Rule making a PM<sub>2.5</sub> in ambient air standard in the Federal Register. The ruling included two new primary PM<sub>2.5</sub> standards, an annual ambient air standard of 15 micrograms per cubic meter (g/m<sup>3</sup>) and a 24-hour standard of 65 g/m<sup>3</sup>. A new Federal Reference Method (FRM) for the determination of PM<sub>2.5</sub> in ambient air was included as part of the final rule.

Efforts to determine ambient concentrations of fine particulate have been underway for some time in various locales. However, in order to determine non-attainment under the new standard, a nationwide network of monitors conforming to the U.S. Federal Reference Method must be deployed imminently to allow the collection and analyses of appropriate data.

Current plans for the U.S. network identify a need for: 850 community-oriented FRM monitoring sites where the mass concentration of PM<sub>2.5</sub> in ambient air will be measured; some 300 sites at which the chemical composition of the PM<sub>2.5</sub> samples could be determined; approximately 100 IMPROVE (Interagency Monitoring of Protected Visual Environment) sites (remote location) which would also support visibility regulations; continuous monitoring at 50 urban centers with populations in excess of 1 million, along with 50 stations at other select locations; and 200 spatial averaging and special purpose monitors.

The establishment of 4 to 8 Supersites for instrument intercomparisons and more sophisticated sample collection and analysis to support future research on human health, is also noted. The EPA is committed to deployment of the FRM portion of the PM<sub>2.5</sub> monitoring network by December 31, 1999.

At the moment all state and local agencies have submitted and received approval of their 1998 network designs and the FRM and a limited number of continuous samplers are being deployed. Figure 6-1 indicates the density of deployment of FRM PM<sub>2.5</sub> samplers in the various U.S. states. Later in 1999, the focus will shift to additional continuous monitors and chemical composition or speciation samplers based on state network designs due in mid-1999.

These plans are roughly responsive to observations tabled at a USEPA/NARSTO (North American Research on Stratospheric and Tropospheric Ozone) workshop held at Chapel Hill, N.C. in July 1998. As a NARSTO event, the workshop attracted Canadian scientific expertise as well as input from the private sector. A focus on the larger population centers, the need for adequate speciation and other data for use in human health impact assessment, and development of nine Super Sites, including sites in the vicinity of Seattle and Chicago, were all advocated.

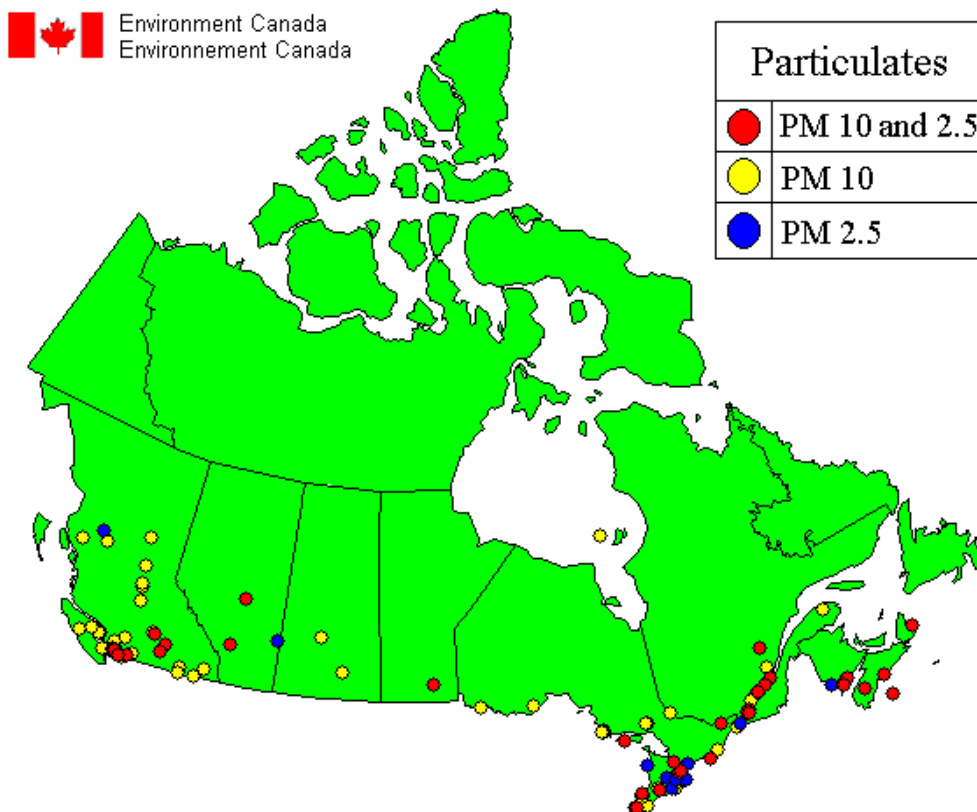
In Canada, as shown in Figure 6-2, PM<sub>10</sub> and PM<sub>2.5</sub> have been measured in approximately 17 cities since 1984. Filters are analyzed for 50 elements, including heavy metals, as well as organic and inorganic ions. Two Supersites, or research locations have been established in the vicinity of Toronto (Ontario), at Egbert (a relatively rural site) and Evans Ave in the SW part of the City of Toronto. Starting in February 1998,

Figure 6-1. Distribution of U.S. PM<sub>2.5</sub> (fine particulate) Samplers in 1st Year (1999/2000)

Source: USEPA-OAR/OAQPS, 1999



Figure 6-2. Canadian Particulate Monitoring Sites



both sites are currently performing intercomparisons of four different types of PM monitors, including those used in the U.S. IMPROVE program and the U.S. PM<sub>2.5</sub> FRM method.

## **Recommendation**

The International Joint Commission should seek further assurances that:

- the two governments are committed to reaching agreement on the use of monitoring techniques that will provide comparable (both in quality and quantity) PM<sub>2.5</sub> data in the U.S. and in Canada;
- speciation of PM<sub>2.5</sub> under U.S. and Canadian monitoring programs will be adequate to determine specific pollutants and, where possible, sources of particular concern to human health throughout both countries; and
- under the U.S. PM<sub>2.5</sub> monitoring program being currently deployed, at least two enhanced monitoring sites (Supersites), be established in the transboundary area.