

short-term releases due to events discussed later.

Group A consists of the following source categories: Sulfite pulp and paper mills, primary copper smelters, primary lead smelters, aluminum smelters, and the top 20 percent of the petroleum refineries in terms of projected annual emissions of SO₂ as listed in the Geographic Targeting Data Base.

Source categories were selected for group B because they have high annual emissions or are subject to events leading to short-term releases of SO₂. In addition, in some instances, there were air quality or exposure data which indicate the source category to be of concern for emitting short-term SO₂ peaks.

The EPA judged group B source categories to have the potential to produce high 5-minute peaks of SO₂ but to pose less risk than group A because: (1) Air quality or exposure data indicated that the potential to emit high 5-minute peaks of SO₂ was less than for group A; (2) the grouping was based on annual emission data, but lacked 5-minute data to estimate risk; or (3) the overall risk posed by the source category was judged to be low. This was the case for industrial boilers because, while exposure analysis indicated that this group was responsible for a considerable number of exposures, the exposures were attributed to a very small subset of industrial boilers. The EPA expects that States will examine their source categories within this group very closely for inclusion in the targeted SO₂ monitoring plan.

The group B sources are as follows: Kraft sulfate pulp and paper mills, secondary copper smelters, secondary lead smelters, the remaining petroleum refineries, iron and steel mills, carbon black manufacturing, portland cement manufacturing, crude petroleum and natural gas extraction processes, phosphatic fertilizer manufacturing, industrial boilers, and sulfuric acid plants.

Industrial boilers were placed in this group because they accounted for about 30 to 50 percent of the 5-minute SO₂ exposure events given in the staff paper supplement (Table 3-5, EPA, 1994b). However, in a study by Stoeckenius et al. (Table 2-14, 1990), approximately half of the total industrial boiler exposures were attributed to a very small proportion (≤2 percent) of the total population of industrial boilers analyzed. Good engineering judgment suggests that the use of higher sulfur coal and short stack height would contribute to an increased likelihood of producing ambient SO₂ peaks.

The group C source category consists of utility boilers. Although utility boilers can emit large quantities of SO₂, many power plants are not anticipated to cause 5-minute violations despite their high emission rates due to tall stacks and steady-state operating conditions. They are placed in group C because as a source category, utility boilers may be responsible for approximately 17 to 37 percent of total estimated exposures (Table 3-5, EPA, 1994b). However, the risk of exposures is very unevenly distributed across the sources in this category. Approximately 75 percent of the utility sector's post-title IV exposures were estimated to result from less than 10 percent of the power plants (Rosenbaum, 1992, Table 3, Burton et al., 1987).

With the passage of the 1990 Amendments, Congress created under title IV an SO₂ emission trading program as an integral part of the Acid Rain Program, which is designed to reduce SO₂ emissions by 10 million tons nationwide by the year 2010. Phase I, which begins in 1995, reduces emissions from the 110 largest emitting power plants, which are identified in table A of section 404 of the Act. The Acid Rain Program introduces a flexibility for sources to choose the most cost-effective compliance strategy to achieve their emission reduction obligations and to maintain the national cap of 8.95 million tons of SO₂ emissions. Compliance flexibility may involve switching to low-sulfur coal, scrubbing, conservation, other emission control technologies, or buying SO₂ allowances.

Title IV sources participating in the Acid Rain Program are under the obligation to match their annual SO₂ emissions with their allowance holdings. They are also required to meet all other requirements of the Act and regulations that apply to them, including the NAAQS. Therefore, the compliance flexibility offered under the Acid Rain Program does not permit any source to violate regulations adopted to attain or maintain the SO₂ NAAQS. Emissions from these sources will be closely tracked, because title IV sources are also required to install continuous emissions monitoring systems (CEMS) and report to EPA on a quarterly basis their emissions of SO₂, nitrogen oxides, and carbon dioxide.

Further improvements in air quality are expected to be realized from the SO₂ emission reductions under Phase II of the Acid Rain Program to be implemented by January 1, 2000 under title IV of the Act. Because of the potential to have higher emissions and because of potential plume downwash

and interaction of complex terrain, EPA is mainly concerned with those power plants that buy allowances rather than reduce emissions themselves in order to comply with title IV and those located in complex terrain, respectively. Complex terrain is defined for modeling applications as that terrain exceeding the height of the stack, but this definition is being applied here for monitoring applications as well. In a study done for EPA, that is contained in the docket for this rulemaking (Polkowsky, 1991), many of the predicted exceedances of the SO₂ standards in the vicinity of power plants should be reduced or eliminated by allocating allowances based on a reduced rate under Phase II. Any remaining exceedances not addressed by the more restrictive Phase II emission rates will require a reanalysis of the SO₂ NAAQS control strategy demonstration and consideration of more restrictive emission limits to protect the air quality standards.

Because of the SO₂ reductions that will occur under the Acid Rain Program, the accurate stack monitoring of their emissions, and the long-range atmospheric transport of these emissions due to taller stacks at most large utilities, EPA believes that higher priority in placing ambient monitors should be given to nonutility sources. However, in instances at a particular power plant where the possibility of high 5-minute emission peaks still exists, EPA believes that consideration should be given by the State to locating monitors near the facility.

2. Other Considerations

In addition to the guidelines and groupings listed above, which are based largely on available information concerning the likelihood of a source type to produce concentrated peaks of SO₂, States may have other information which may lead them to believe that a source located in a lower probability group should be made a higher priority for SO₂ monitoring. Of particular importance to consider is any available information on potential population exposure, inferred in part by the population in the vicinity of the source.

In addition, other information can be incorporated by States into an evaluation of the relative likelihood of sources under their jurisdiction to produce SO₂ exposures, thus refining their judgments on priority of monitoring decisions. Such other information can include the type of process being used (i.e., one type of process within a source category may be less efficient and known to emit more SO₂ than a newer one), a history of past