

NEW PRIORITIES IN AIR POLLUTION CONTROL

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The "Air Quality Act of 1967," (P.L. 90-148, November 21, 1967) by legislation, established a number of "scientific" principles and a system ("Air Resource Management") to relate and apply these principles. Subsequently, the mandated scientific principles were found to be not completely verifiable and, in practice, the system fell apart.

It is not unusual for governmental programs to fail, but this program has had a number of unique aspects. First, there is the almost ludicrous occurrence of a legislatively mandated science. Congress, though, must be given credit for holding extensive and detailed hearings prior to the passage of the 1967 Act. Also, the Senate Committee which reported out the Bill, prepared an excellent committee report clearly indicating legislative intent and carefully defining procedures and terminology. Second, Congress recognized and remedied its mistake in a relatively short period of time (3 years) with the passage of the "Clean Air Act Amendments of 1970." Third, there are presently a number of people in the profession who fail to recognize that the approach to air pollution control has been significantly modified. They tenaciously continue to attempt to prove that certain scientific principles (various elements of "Air Resource Management") exist—even though the system, in which these principles are to operate, has proved unworkable and has been made obsolete by recent legislation.

The 1970 Act has not only provided for an adjustment in various time schedules and priorities—but, it has forced an almost complete reorganization and change in approach of the federal step-by-step system to improve the nation's air quality. The 1967 Act's "Air Resource Management" system has been replaced by a more pragmatic and realistic approach. In order to work effectively under the rules of the new "game plan" it is necessary to understand how and why the 1967 system failed and is modified. It is also necessary to recognize how the new system is requiring a reordering of priorities with respect to programs involving diffusion modeling, control technology and the development of standards (both emission and ambient).

In 1967, The Department of Health, Education and Welfare published "guidelines" (1) for a step-by-step implementation of the provisions of the 1967 Act. The Act and the "guidelines" established the following system:

1. Designate "Air Quality Control Regions"—Considering various meteorological, topographical, urban-industrial concentration and jurisdictional boundary factors, geographical areas are established which constitute a region "relevant to effective implementation of air quality standards." Such regions were often referred to as "air basins," "air sheds," or "problem sheds." It was originally conceived that these would be areas of uniform air quality, demography or problem (emission) types.

The designation of the first series of Regions was accompanied by rather elaborate hearings, the issuance of press releases and the publication of "Consultation Reports." These reports sought to justify the proposed regional boundaries with "relevant" demographic data and predicted concentration isopleths (based upon a diffusion modeling technique, of questionable accuracy).

After the first series of designations, the hearings became perfunctory, the press releases became routine and the Consultation Reports were discontinued. Designations were primarily based upon the "Standard Metropolitan Statistical Areas" and other political considerations. Apparently it was realized that the question of political jurisdiction (the governmental entity capable of implementing the standards) was of primary importance. Also, it became obvious that the proposed Regions were too large to be considered "air basins" or areas of uniform problems. The diffusion models became an exercise to justify a previously made administrative decision.

The 1970 Act recognized that the regional designations were a pointless charade and provided that by the end of March 1971, EPA complete its designation of

Regions. The states are then responsible for dividing the remaining area under their jurisdiction into "two or more air quality control regions."

Thus, the Regions no longer have practical significance—except in instances where state implementation plans will have to give recognition to interstate problems. The extent of this recognition, though, will require further examination since the federal Regions have mostly been designated according to county lines—which are not directly related to diffusion phenomena.

The discontinuance of the time effort and money devoted to this activity is long overdue. Later this year, when the entire nation is covered by Regions, (as required by law) this whole process should be forgotten. State implementation plans will consider coordinated control programs for the entire state. Special attention can be given to local "air basin" and interstate problems—but, there is no need to (and, in fact, could lead to a fallacious approach to) base control efforts on rather arbitrarily defined regions.

2. Publish "Air Quality Criteria" Documents—"Air quality criteria represents a scientific evaluation of the extent to which individual pollutants or combinations of pollutants are harmful to health and damaging to property. By providing an indication of the predictable effects of various levels of pollutant concentrations on public health and welfare, the criteria provide guidelines for the establishment of air quality standards. They are thus an integral part of the information that the States will need to set meaningful air quality standards for various pollutants." (2)

A number of criteria documents have been published. These documents mainly consist of well-referenced excerpts from published information on the effects of air pollutants. Knowledgeable and interested persons can examine this material and refer back to the original articles, which often contain reservations and qualifications with respect to the published information. Information such as sampling and analytical techniques, which is vital to an informed evaluation of study results, is contained in the original work. The final chapter in the criteria document is the "Summary and Conclusions." This chapter contains extracts from the main body of the report with some discussion. The references are not given and therefore all of the caveats contained in the original work are lost. Probably the most important (or at least most quoted) section of the criteria documents is a "resume." This is an extract of the "Summary and Conclusions" and gives the appearance of a series of straightforward unqualified facts.

This resume has been further interpreted and embellished—especially at public hearings on air quality standards—to the point where the original work is almost unrecognizable. Over-simplified, erroneous conclusions have been drawn by the uninformed and presented to the public in a manner to support the positions, programs or previously arrived at conclusions of various groups.

Although public hearings are no longer required for the adoption of ambient standards (as discussed below) and the public use of the criteria documents has been somewhat restricted, there is a need to simplify and clarify criteria information. Suppositions and extrapolations based upon information taken out of context must be eliminated. Additional research on the effects of air pollutants and a thorough review of existing criteria documents is needed to provide facts upon which to base standards.

3. Adopt Ambient Air Quality Standards—The 1967 Act provided that (assuming adverse levels of pollutants were indicated in the criteria documents) the states hold public hearings and adopt Air Quality Standards. The achievement of these standards would then protect public health and welfare.

Because of misinterpretation of the criteria documents and a logical position by the public that the goal should not be "safe" levels, but the cleanest air possible—ambient standards, quite close to background levels, were adopted by many states. Thus, for the purposes of adopting standards, the criteria documents have become somewhat moot. The goal has become (and properly so) to obtain the cleanest air possible—in the shortest possible time.

The 1970 Act provides for EPA to adopt ambient air quality standards for any pollutants for which criteria are issued. Public hearings are not required.

Based upon previous indications of the public's desire, it would seem appropriate that consideration of the lowest levels of pollutants achievable be a major factor in setting these standards.

4. Adopt Emission Standards—Both the 1967 and 1970 Acts require that the states develop "Implementation Plans" for achieving the established ambient standards. Emission standards (upon which regulations are primarily based) are an essential part of these plans.

The federal guidelines⁽¹⁾ propose an elaborate system for establishing emission standards. Emission inventory information is used with diffusion modeling to determine the reduction needed in present emissions to achieve the ambient standards. This technique requires accurate and detailed emission inventory information (which could take years to gather and still not be useful in predicting short-term concentrations) the availability of accurate and long-term aerometric and meteorological data, and the availability of an acceptable diffusion prediction technique. Aside from the fact that the proposed system is impractical and thus far unworkable (no definitive federal review of a state implementation plan has been based upon diffusion modeling)—it is unnecessary. As previously indicated, ambient standards are close to background levels. This requires that emission standards be close to zero. Also, in order to achieve the cleanest air possible (a proposed basis for ambient standards) it is necessary to apply the best available control technology to air pollution sources.

Thus, the basis for emission standards should be the best available control technology. This was recognized in the 1970 Act, which provides for federal emission standards for new or modified stationary sources of air pollutants. The federal emission standards are to reflect "the degree of emission limitation achievable through the application of the best system of emission reduction..." It is obvious that these standards will be incorporated in state regulations for existing sources (especially since federal regulations will cover "modifications" to existing sources).

Diffusion modeling, therefore, need not (and probably will not) be used in relating ambient to emission standards. The effort now being devoted to this exercise (although academically interesting) should be replaced with a program to develop emission standards—numbers, not just the general type of information contained in the "Control Techniques" documents issued under the Clean Air Act. Modeling could be employed in evaluating other emission control techniques (such as land use planning, alternate methods of waste disposal, etc.) to augment the implementation of emission standards in achieving the established ambient standards.

5. Monitor Air Quality—A major purpose of ambient air sampling is to determine if ambient standards are being met so as to adjust implementation plans (revise emission standards, enforcement priorities or other control techniques) if needed. This would be possible if sampling equipment (not just analytical techniques) was standardized and uniform criteria for sampling station location were developed. Because this standardization does not exist, compilations and comparisons of air quality data are leading to erroneous conclusions (e.g., interpretation of air quality criteria) and considerable difficulties in evaluating the success of air pollution control programs. Millions of dollars are now being spent on air sampling systems, and it is vital that these systems be standardized as soon as possible.

A number of programs were initiated as a result of the Air Quality Act of 1967 and the mandated Air Resource Management approach. The 1970 amendments have provided for a more practical and effective program. It is necessary to decrease emphasis on such activities as regional designations, extensive publication of criteria, detailed studies of the relationship of criteria to ambient standards and the development of exotic models to relate ambient standards to emissions standards. It is important to overcome the momentum built up in attempting to implement elements of the previously accepted Air Resource Management system, in order to have sufficient resources for more meaningful and productive activities such as the development of realistic emission standards, the standardization of air sampling systems, and the application of land use and waste management techniques to control air pollution.

REFERENCES

- (1) "Guidelines for the Development of Air Quality Standards and Implementation Plans," U.S. Dept. of H.E.W., May 1967.
- (2) "Progress in the Prevention and Control of Air Pollution," Document No. 92, 90th Congress, 2nd Session, June 28, 1968.