

EQL MEMORANDUM NO. 13

OUTLINE OF AN APPROACH TO MANAGEMENT STANDARDS

by

Kenneth Heitner\* and James E. Krier\*\*

January 1974

Supported in part by the National Science Foundation, Research Applied to National Needs (RANN), under Grant No. GI-29726

\*Research Engineer, Environmental Quality Laboratory.

\*\*Professor of Law, UCLA, and consultant to EQL.

## Introduction

In its book SMOG: A REPORT TO THE PEOPLE (1972), the Environmental Quality Laboratory (EQL) proposed that "management standards" be used as an approach to air quality in the Los Angeles Basin. The concept of management standards is based on technical, economic, and social feasibility. It envisions a relatively long-term, relatively stringent ambient air quality goal to be achieved eventually through a specified series of time-phased steps. Each step would set a target date by which there must be achieved substantial percentage reductions in the number of days per year on which the long-term ambient air quality goal is violated, reducing this figure by the ultimate target date to no (or insignificant) days of violation annually. Management standards thus aim at long-term goals, but they insist as well upon short-term, time-phased improvements -- each of which demands all feasible control steps, and each of which enhances air quality relative to what it was before.

The outline that follows represents a first attempt at thinking about application of the management standards concept on a nationwide basis. The purpose is to achieve the commendable objectives of the Clean Air Amendments of 1970 in a manner that takes into account the varying problems and conditions that exist in different air quality regions. The approach suggested in the outline would preserve the strong features of the Clean Air Amendments; it would also require by law certain planning steps that have in fact been taken under, though they were not a formal

part of, the Clean Air Amendments. The suggested approach would work as follows, the items on the outline being given in the order of their occurrence.\*

I. Promulgation of Uniform National Primary Ambient Standards

A. The EPA would (as at present) promulgate uniform national primary ambient air quality standards to serve as long-term goals.\*\*

The standards should be expressed in terms of zero days of violation, as opposed to the present expression of no more than one day annually.

B. Each region would be required ultimately to reach these standards, but (unlike the provisions of present law) there would be regional variations among the prescribed times of attainment, as shown below.

II. Designation of Regional Classifications

The EPA would designate that as to each pollutant for which an ambient standard has been promulgated, each region will fall into one of the following two classes:

Class A. Regions in this class can in the judgment of the EPA meet the primary ambient standard by 1977 in accord with present law.

Class B. Regions in this class cannot in the judgment of the EPA meet the primary standard by 1977 in accord with present law.

---

\*This discussion is concerned with primary air quality standards; some remarks about a possible approach to secondary standards are made later (p. 15).

\*\*Strong arguments can be made for the proposition that, even in the long term, air quality standards should vary region by region. At least for the present and near future, however, there appears to be a commitment to uniform national standards. Accordingly, we search for a rational approach within this constraint. Decisions can be made later about whether uniformity in the long term represents good policy. Should the ultimate judgment be that it does not, the approach we sketch here would be equally, if not more, applicable.

III. Promulgation of Management Standards

- A. Within a specified period of time the EPA would promulgate management standards for each pollutant, expressed in terms of percentage reductions (in the number of days of violation of the ambient standard) required by given dates for Class B regions. The percentage reduction required of each region would depend upon the number of days each region's average ambient air quality for the years 1968-72 exceeded the ambient standard. As an example, for oxidant the EPA might promulgate the percentage reductions and dates of attainment illustrated in Figure 1 and Table 1.
- B. Depending upon its starting point (see Item IV), each region would be required to meet at least the required reductions by the specified time. That is, the requirements as to both time and degree of reduction are minimums. The negotiation process (Item IV) could result in requiring more. In addition, when justified by subsequent events, a Class B region could be reclassified to Class A and taken off the management standards schedule.
- C. Note that the hypothetical management standards schedule, illustrated in Figure 1 and Table 1, operates such that the worse the quality of a region's air (in terms of number of days of violation annually), the more it is required to improve in both absolute and relative terms. In other words, the more serious a region's problem, the more resources it must devote to it.

FIGURE 1 - PROPOSED  
MANAGEMENT STANDARDS  
FOR CLASS B REGIONS

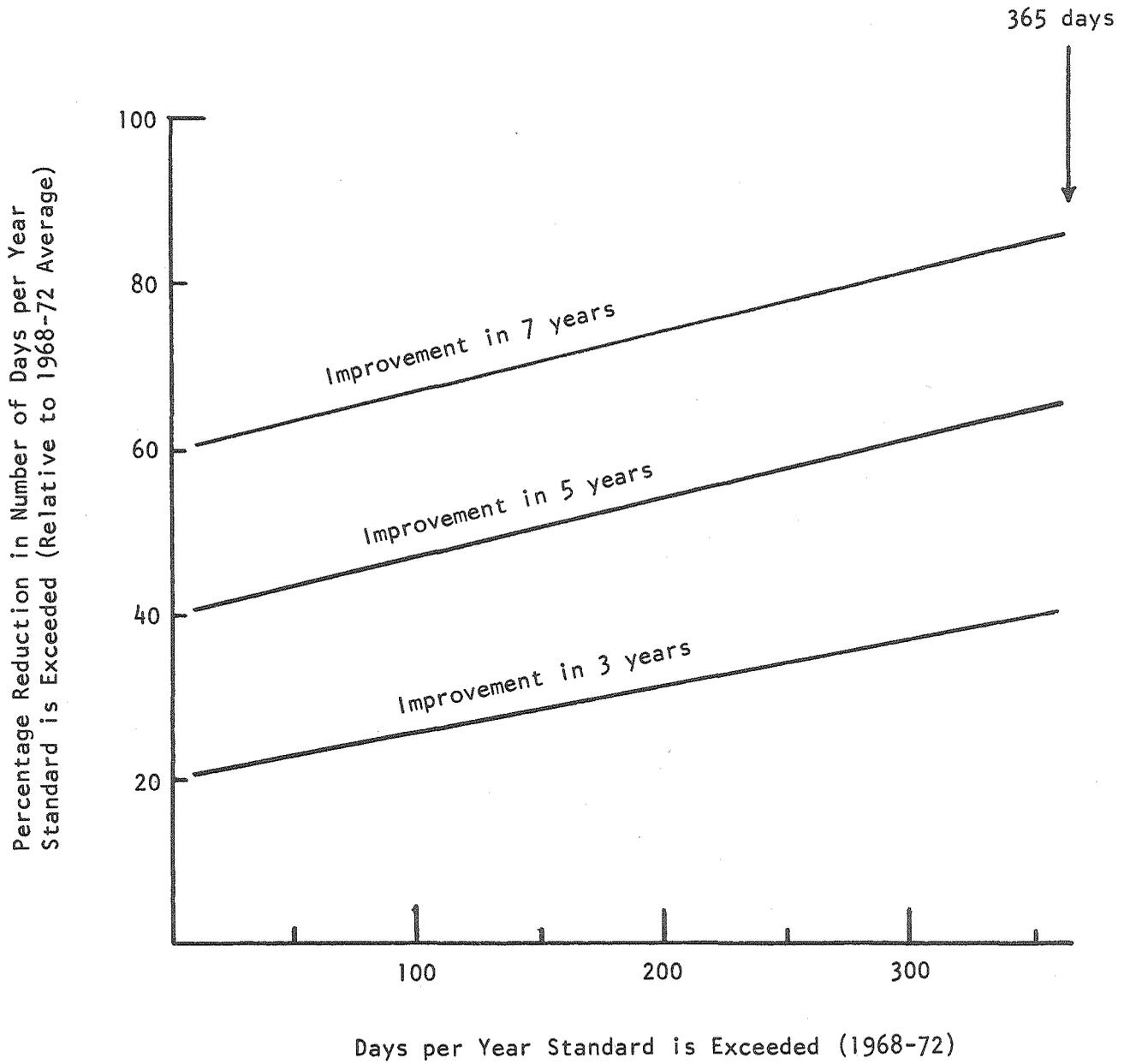


TABLE I

PROPOSED MANAGEMENT STANDARDS FOR CLASS B REGIONS

Days per Year Standard is Exceeded (1968-72)	10	30	50	100	200	365
Allowable Days per Year of Violation in 3 Years from Base Year (1970)	8	23	39	74	138	219
Allowable Days per Year of Violation in 5 Years from Base Year	6	17	28	53	92	137
Allowable Days per Year of Violation in 7 Years from Base Year	4	11	18	33	52	55

IV. Implementation Plans

Implementation plans would be part of the following planning sequence:

A. State and local government, working together, would be required to submit implementation plans by a specified date.

1. Local governments, after hearings and other open-planning procedures (meeting with key local interest groups, experts, public leaders, etc.), submit their plans to the state.

2. The state prepares a preliminary plan, holds hearings (and employs other open-planning procedures), revises the plan in negotiations with locals, and submits the preliminary plan to the EPA.

B. The EPA reviews the preliminary plans under the following guidelines:

1. Each region is presumed, as to each pollutant, to fall into Class A. The plan for the region can either:

(a) accept this presumption, in which case the plan must set forth the measures to be employed to realize the federal standards in accord with present law; or

(b) overcome this presumption by showing in a preliminary fashion the measures necessary to comply with Class

A requirements, and the technological, economic, and social factors that make such compliance infeasible.\*

---

\*Feasibility should be judged with reference to such factors as availability of technology within a given time period, direct economic costs, social dislocation, induced unemployment, and so forth. Criteria and guidelines on feasibility would, of course, have to be developed.

(In effect, then, each region must submit at least a rough Class A plan.) Regions in this category shall also submit (1) data showing the number of days per year on which average air quality for the years 1968-72 violated the federal ambient standard; (2) a plan setting forth the measures to be employed to comply with the management standards applicable to the particular region; and (3) data, if any, indicating the technological, economic, and social factors that make infeasible compliance beyond the minimum management standards applicable to the particular region.

2. Each plan should be judged in the following terms:
  - (a) Is there adequate data to support the plan?
  - (b) Are justifiable conclusions drawn from the data?\*

Each plan should be clearly adequate to meet the federal standards (Class A), or the management standards (Class B), depending on the case. To support a plan it is important that good data be presented on the technologies that are specified in the plan to reduce pollution from various sources. Timetables on the availability of these technologies and the rates of their introduction should be stated.

Where no technology exists, social and economic measures should be offered as alternatives. Again, the times and rates of introduction should be stated.

---

\*The EPA should be prepared to provide technical assistance with respect to gathering and employing data for the plans.

In many cases, the implementation plans will require new and innovative technologies, as well as novel social and economic measures. It will be hard to predict in advance how well these will actually work. The planners should be encouraged to experiment with many pilot projects for different ideas. These pilot projects must try to achieve certain goals in certain time periods, so that their applicability to the main plan can be evaluated. Repeated failure of the overall plan or its sub-parts to meet intended goals could be the basis for imposition of other control alternatives.

C. The EPA, based upon the above and its independent study, prepares a proposed revised plan for each region in response to the region's submittal. The EPA plan would be a Class A or B plan, or a plan fixed at any point in the spectrum between A and B. (For example, the EPA counterproposal might conclude that a state cannot meet Class A requirements but can do better than the minimum Class B requirements.) The EPA proposal would be published and local hearings would be held.

D. The EPA and state and local representatives negotiate the final plan, it is published, hearings are held, it is revised and becomes final. This negotiation phase is presently occurring under the Clean Air Amendments -- at least in the case of Los Angeles. We would codify this phase. The EPA, of course, would have the final voice in negotiations, subject to judicial review.

E. The requirements of the 1970 Act for preparation of emergency plans for air pollution episodes are excellent. In addition, the plans should

contain evaluations of the number of episodes that will occur and show how the control strategy and alert plan will reduce the number of these episodes.

F. The implementation plans should contain specific discussion of the problems that are anticipated in the period beyond the plan period. This could include a program of R&D that the state (or local) government envisions to cope with its problems in the future. The federal government could then better coordinate and direct its own research efforts and those of the state (and local) governments to solve these problems.

V. A Caveat

It may be that as to some pollutants in some regions (e.g., SO<sub>2</sub> in Los Angeles), technological and economic considerations will suggest that any percentage improvement in ambient air quality is impossible and that perhaps even some deterioration of air quality may have to be tolerated in the short term. Our approach thus far does not provide for such instances. We believe they should be dealt with, if they arise, on the basis of case-by-case negotiations.

In the Los Angeles Basin some utilities have already made plans for managing their supplies of high-sulfur and low-sulfur oil so as to minimize the adverse environmental impact. With the aid of a network of ground monitoring stations downwind of a given power plant, utilities can take advantage of favorable meteorological conditions (high inversion layers, strong winds) to burn high-sulfur fuel, and switch to low-sulfur fuel when the base of the

inversion layer is low and the primary federal standard of 0.14 ppm of SO<sub>2</sub> is in danger of being exceeded. At the same time, utilities are actively encouraging electric energy conservation, so as to reduce the total amount of fuel they are required to burn.

#### VI. Replanning

We have suggested in effect a "NEPA-like" approach to implementation plans -- all alternatives must be explicitly considered and the final approach justified relative to these. But replanning is also necessary as conditions, the available technology, and so forth undergo change. There should be provision in the law for periodic review by the EPA of its classifications and the management standards requirements. There should also be provision, in conjunction with or independent of this, for repetitions of the entire implementation process outlined above -- a requirement, say, that each state start anew every five years.

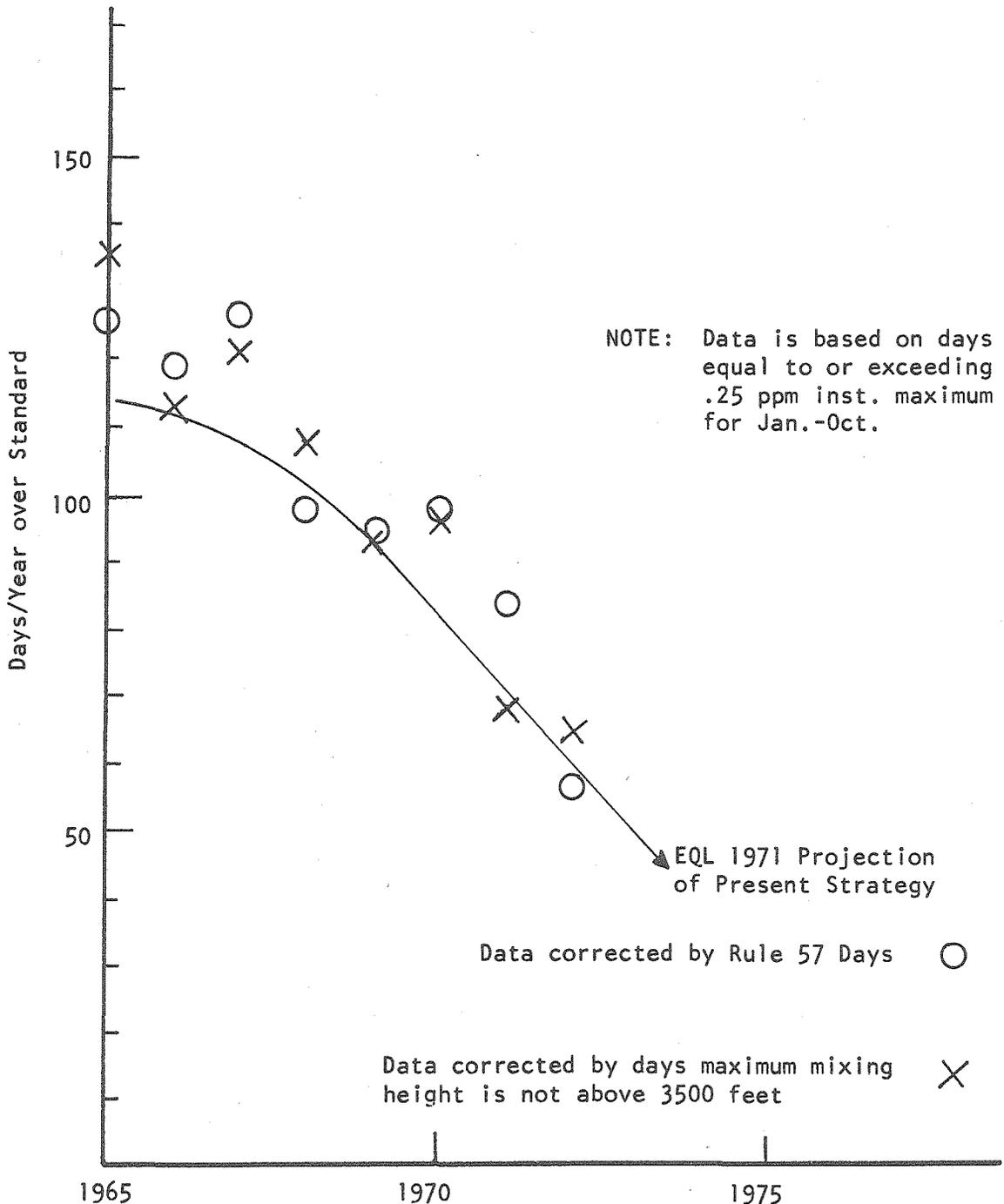
As an indication of the need for replanning, consider for example Figures 2 and 3, which illustrate the recent history of the oxidant air quality problem in Los Angeles. If the standard of 0.2 ppm for one hour is taken, it is seen that the number of days of violation has been steadily decreasing. On the other hand, if we consider the standard of 0.1 ppm for one hour, the number of days of violation has not significantly decreased. These curves are a source of two concerns.

One is, of course, the question of the continued health effects from the persistent low levels of oxidant. While the reduction in the number of days per year at 0.2 ppm for one hour is a great improvement to people who

FIGURE 2

LOS ANGELES COUNTY PORTION OF SOUTH COAST AIR BASIN  
IMPROVEMENT IN OXIDANT AIR QUALITY

(Standard is 0.2 ppm for 1 hour)



1965

1970

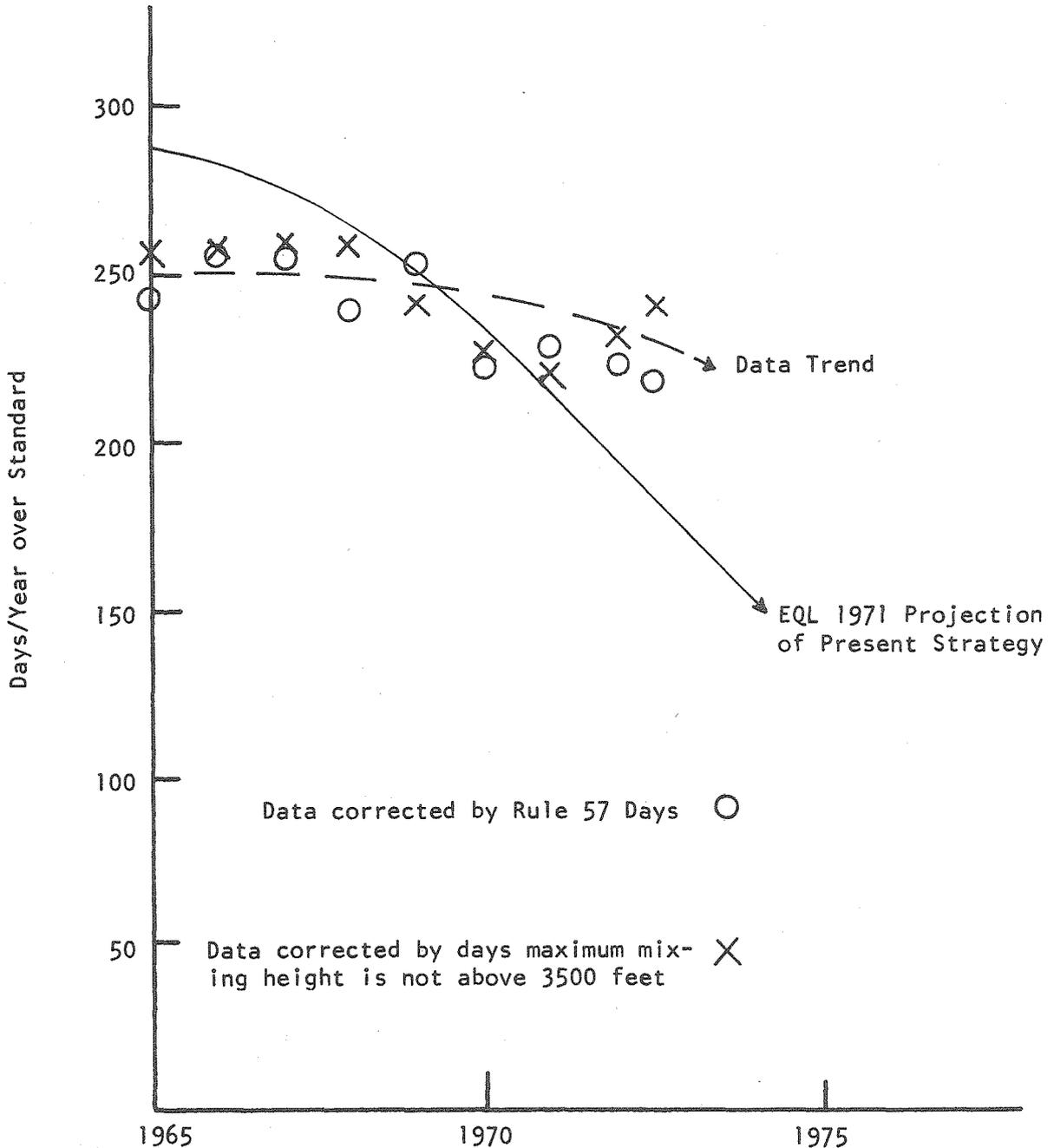
1975

A Rule 57 Day is one on which the inversion base at 4:00 a.m. PST is lower than 1500 feet, and the maximum mixing height is not above 3500 feet, and the average surface wind speed between 6:00 a.m. and 12:00 noon PST does not exceed 5 miles per hour.

FIGURE 3

LOS ANGELES COUNTY PORTION OF SOUTH COAST AIR BASIN  
IMPROVEMENT IN OXIDANT AIR QUALITY

(Standard is 0.1 ppm for 1 hour)



A Rule 57 Day is one on which the inversion base at 4:00 a.m. PST is lower than 1500 feet, and the maximum mixing height is not above 3500 feet, and the average surface wind speed between 6:00 a.m. and 12:00 noon PST does not exceed 5 miles per hour.

have health problems already, we do not fully understand the consequences of continuing to subject people to lower levels.

The second concern is the need for a much clearer understanding of the sort of emissions reductions needed to actually reduce the number of low level days. Initial assumptions were overly optimistic. Quite apparently, the measures presently in effect are insufficient to really make much of an improvement.

The purpose of showing both the projections made by the EQL staff in 1971 and the actual air quality data is to suggest the monitoring and re-planning required in a management standards approach. For a plan to show decreases in the number of days per year certain standards are violated is only a beginning to the implementation process. Quite clearly, the goals set in original projections of 1971 are not being met. This should be a sign to both the state (regional) and EPA planners that they will have to review the entire plan, find out which elements are not working, where there are loopholes, etc., and formulate a new and hopefully more effective plan.

In the case shown here for Los Angeles, we know now that part of the error in our 1971 projections for improvement in air quality can be traced to overly optimistic projections for reductions in emissions of reactive hydrocarbons. This has been partially corrected by improved inventories of the sources of hydrocarbon emissions prepared by the EPA. However, recently released documents giving the results of surveillance tests on both exhaust and evaporative emissions from automobiles (APTD - 1544) show the emissions controls for evaporative losses have not been working well. This means even the EPA's projections may be optimistic.

Furthermore, a more careful review of both air quality data, traffic data, and automobile registration data has shown that the 3-4 percent annual growth rates used to project future emissions for the entire Basin do not properly represent certain portions of the Basin where the growth rates have been much higher (7-8 percent per year). If future projections are to be realistic, a more detailed accounting of these differing growth rates will have to be made in order to have a realistic control strategy. Finally, in addition to our ability to accurately forecast and control emissions, our technical understanding of the relationship between emissions and air quality is still limited. All we do know is that our past predictions have been too optimistic.

It is precisely limitations in our abilities as planners, such as these, that require the management standards approach we have described. Only such a flexible approach can allow us to make the best progress toward the goal of cleaner air.

#### VII. Inducements and Sanctions

More attention should be given to inducements for the planning procedure. One inducement (and sanction) is that of present law -- the EPA should have the final authority to design and enforce any state's (region's) plan, subject to judicial review. But something more workable might be needed.

Perhaps the solution is some sort of federal support of air pollution control programs given to those states which do achieve the targets of the final plan, geared to the amount of achievement. This would say to a state, "The more of the burden you carry now, the less you will have to carry later."

This support would not only include financial aid to research, development and operation of the state and regional air pollution authorities, but could be broadened to include other federal programs involved in air pollution control. One example is utilization of federal funds for improved public transit, or even highway construction if the emphasis were on special lanes for high occupancy buses and other vehicles. The federal government will doubtlessly also be making decisions about the allocation of clean fuels in the near future. In many cases, the federal government may well ask the states to show that they have done as much as possible on their own initiative to solve these problems, before making any allocations.

#### VIII. Secondary Standards

There are a number of ways in which secondary standards could be approached. The EPA could, as at present, promulgate uniform secondary ambient standards and require, also as at present, that they be achieved within a reasonable time. The case for uniformity, however, seems markedly weak. The arguments for uniform standards made in the past all evince, in essence, a concern with protecting health on a nationwide basis. Secondary standards are concerned not with health but with other "public welfare" considerations (by and large dealing with economic factors). This being so, the central arguments made in support of uniformity would appear far less applicable; further, inasmuch as secondary standards are concerned with economic factors, they pose issues of economic tradeoffs in a clear fashion -- and thus can be forcefully said to call for a basin-by-basin, benefit-cost approach.

Thus, as more attractive alternatives the law might be changed to require that secondary standards be approached by the same general management standards method that we suggest here for primary standards, or changed to require the EPA to promulgate nonuniform secondary standards on a region-by-region basis, in light of circumstances existing in each.