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FINAL REPORT

FEDERAL ADVISORY COMMITTEE ACT (FACA)
SUBCOMMITTEE FOR OZONE, PARTICULATE MATTER
AND REGIONAL HAZE IMPLEMENTATION PROGRAMS

FINAL REPORT ON SUBCOMMITTEE DISCUSSIONS
THROUGH DECEMBER 1997

MAY 1998

Submitted to:

Air Quality Strategies and Standards Division
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About the Subcommittee for Ozone, Particulate Matter and Regional Haze Programs

The Subcommittee for Ozone, Particulate Matter and Regional Haze Programs was established by the EPA as a part of the Clean Air Act Advisory Committee. The Subcommittee was established to advise and make recommendations on integrated approaches for implementing any revised national ambient air quality standards (NAAQS) for ozone and particulate matter as well as a new regional haze program.

Disclaimer

This document reflects the comments and discussions of the FACA Subcommittee and its work groups and does not constitute EPA's position on these topics.

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Executive Summary

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INTRODUCTION

The U.S. Environmental Protection Agency (EPA) established the Subcommittee for Ozone, Particulate Matter and Regional Haze Implementation Programs (Subcommittee) in September 1995 as a part of the Clean Air Act Advisory Committee (CAAAC), under the authority of the Federal Advisory Committee Act (FACA). At the time, EPA was in the process of conducting a scientific review of the national ambient air quality standards (NAAQS) for ozone and particulate matter (PM). In addition, the Ozone Transport Assessment Group (OTAG) was evaluating regional strategies for attaining the ozone standards in the East, and the Grand Canyon Visibility Transport Commission (GCVTC) was developing recommendations on strategies for addressing regional haze in Class I areas (national parks and wilderness areas) on the Colorado Plateau. The Agency recognized that these regional control studies, along with the NAAQS review, could prompt significant changes in NAAQS implementation programs. Recent information confirms linkages between the emissions and atmospheric processes leading to formation of ozone, PM, and regional haze. Therefore, EPA believed it was important to initiate a process through which it could obtain advice and recommendations from a broad group of stakeholders on possible new, integrated approaches to attaining the NAAQS and reducing regional haze visibility impairment.

The Subcommittee was formed to discuss a range of policy and technical issues (and provide consensus recommendations where possible) related to implementation programs for attaining new/revised NAAQS and reducing regional haze in Class I areas. One objective of the Subcommittee was to examine key aspects of the existing implementation programs and to consider ways to more effectively implement these programs. Another objective was to explore innovative approaches for implementing new air quality standards and a regional haze program that could integrate broad regional and national control strategies with more localized efforts for improving air quality.

This report summarizes the major issues and recommendations discussed by the Subcommittee and its working groups from September 1995 through December 1997. It provides a comprehensive review of the Subcommittee's work and includes some of the summary information found in the Subcommittee's Initial Report on Subcommittee Discussions (issued in April 1997). This executive summary describes the process followed by the Subcommittee in developing its recommendations for EPA. It also reviews the six main "charges" given to the Subcommittee upon its formation and discusses the activities and work products put forth by the Subcommittee to meet each one. This Executive Summary and this report have been reviewed by Subcommittee members and approved as adequately and reasonably reflecting the papers developed and discussions held by the Subcommittee. Such approval does not constitute an endorsement of all the ideas or recommendations presented in the report.

SUBCOMMITTEE PROCESS FOR DEVELOPING ISSUE PAPERS

The Subcommittee comprised eighty-three (83) members representing a broad range of interests in air quality management, including State, local, and Tribal governments, environmental and public health groups, industry, private consultants, academia, and other Federal agencies. The Subcommittee had four work groups and a coordination group. (Appendix A lists the Subcommittee and work group membership.) Upon their formation, the work groups identified priority issues to address and assigned lead authors for developing "issue papers." Each issue paper describes the background of the particular air quality management issue and presents options and recommendations for Subcommittee consideration. Work group members were charged to develop innovative solutions to issues even if they were outside of the current statutory or regulatory framework—to "think outside the box." In addition to the work groups, numerous ad hoc groups were formed to address specific issues.

CONTENT-RELATED PRINCIPLES ENDORSED BY THE SUBCOMMITTEE

In order to guide the overall development of issue papers, the Coordination Group developed a set of "Content-

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Related Principles" in January 1997 .[1] These principles were fully endorsed by the Subcommittee and are a significant product of consensus by this body. The principles emphasized a number of important themes, such as timely environmental progress, the consideration of flexible and effective approaches to reducing emissions, and integration across the three programs where possible. These principles, listed below, served as the foundation for many of the issue papers and recommendations developed by the Subcommittee:

1. *Progress toward attainment of revised NAAQS and achievement of regional haze program requirements should be achieved in an expeditious manner. Timetables for achieving progress should be informed by consideration of a number of factors, including health and environmental benefits, cost and technical impediments, available scientific information, requirements of the Clean Air Act (CAA), and administrative requirements.*

2. *In the event of State or other responsible institution's failure to plan (or to participate in planning) and implement plans, within the designated timeframes, the Federal government must take timely action to remedy the situation.*

3. *All options/recommendations must be based upon specified deadlines for planning, implementing and attaining the NAAQS and implementing regional haze program requirements.*

4. *All options/recommendations which may require amendments to the CAA must be clearly identified with advantages and disadvantages for such changes analyzed.*

5. *Assure timely environmental progress. Timely environmental progress means, at a minimum, continuing air quality improvements at a rate no less rapid than will be required to meet the current NAAQS. Early Federal, State and local actions to improve PM-fine air quality should be encouraged.*

6. *Control strategies should be effective in achieving air quality objectives, should be designed to accommodate flexible response methods by emission sources, and should encourage continuing improvements in air quality. To this end, the advantages, disadvantages, and available information on cost effectiveness of a full range of control methods should be presented, including technology-based performance standards, market-based approaches, and other traditional and nontraditional approaches.*

7. *All options/recommendations should provide for the use of best available, scientifically-based explanations to be used in planning requirements and control strategy development. Such options/ recommendations should include methods to identify the role of non-local transport processes and mechanisms designed to address such processes.*

8. *Opportunities for integration of planning and implementation for ozone, PM, and haze that achieve better environmental results and lower costs should be fully pursued.*

9. *Planning and implementation proposals should identify methods for early and continued involvement of potentially affected interests, to the maximum extent possible, to assist in the attainment of the revised NAAQS and achieving reasonable progress toward regional haze program goals.*

In July 1997, the EPA promulgated new NAAQS for PM-2.5 and ozone and revised NAAQS for PM-10. The Agency also issued a proposed regional haze rule at that time. At the time the new standards were promulgated, the President issued a directive entitled *Implementation Plan for Revised Air Quality Standards.* These regulatory actions and the Presidential Directive affected many of the issue papers that were currently under discussion by the Subcommittee. Several concepts emphasized by the Subcommittee in its Content-Related Principles and issue papers are reflected in the Presidential Directive. A broader discussion of the Presidential Directive and common issues discussed by the Subcommittee is included in a later section of this summary.

It is important to note matters that were not considered by the Subcommittee. These include: the appropriate level of the underlying NAAQS, the technological feasibility or cost-effectiveness of specific implementation strategies, whether any particular implementation strategies will

[1] U.S. Environmental Protection Agency, Subcommittee for Ozone, Particulate Matter and Regional Haze Implementation Programs, Coordination Group, "Content-Related Principles for Developing Work Group Issue Papers" (January 24, 1997).

demonstrate compliance with the applicable NAAQS, and the extent to which proposed implementation strategies are consistent with the CAA or other law.

The Nature of the Subcommittee's Deliberations

The Subcommittee was charged by EPA to review a number of complex policy and technical issues that could significantly affect air quality management into the foreseeable future and to discuss and recommend innovative solutions that meet the concerns of all stakeholders involved. This was an extraordinarily challenging task.

Nevertheless, the Subcommittee succeeded at many aspects of this task. Reaching consensus on the Content-Related Principles was a significant accomplishment of the Subcommittee. In addition, the *Conceptual Model* developed by the Science and Technical Support Work Group provided a basis for evaluating issues discussed by the Subcommittee. Further, the process resulted in the development of a number of innovative solutions, some of which received consensus.

Over 13 two-day meetings held across the country from September 1995 to December 1997, the Subcommittee considered numerous air quality management issues brought to it in some 25 issue papers from the work groups. Each paper provided sets of options or recommendations for Subcommittee consideration. Due to the high level of interest in this process, EPA sought to include a number of representatives from similar stakeholder groups in order to have a broad level of participation. The Subcommittee was initially formed with 56 stakeholders, but was later expanded to include 83 members, with more than 100 additional individuals on work groups providing information and position papers to the Subcommittee. The stakeholders were able to thoroughly discuss the issues, identify what has worked in the past and what is problematic, propose new ideas or options for addressing the issue, and discuss the pros and cons of each option. This report summarizes the work group and Subcommittee-recommended options for each issue paper and describes the principle areas of agreement and disagreement across the Subcommittee.

There were other successes in this process. It provided the stakeholders with a national forum for discussion of a broad array of complex issues. It allowed all participants, including EPA management and staff, to increase their understanding of Subcommittee members' concerns and positions. It highlighted solutions for important issues for which there is a near-consensus, and those for which significant controversy still remains. The process enabled the participants to present potential new approaches for addressing scientific and economic concerns at the same time that new policy approaches were under consideration.

Another success was in creating a forum where scientists and policy stakeholders could learn from one another. Scientists questioned other stakeholders' ideas if they presumed too much about atmospheric processes or misstated scientific information. On the other hand, some stakeholders encouraged the scientists to push the scientific consensus to its practical limits for implementation. The process also expanded members' appreciation of the value and need for continued cooperation and dialogue with EPA and with each other as the NAAQS and regional haze rules, policies, and guidance are developed in the future. The discussions conducted here should serve as a firm jumping-off point for further consideration of the complex implementation issues facing the country with the promulgation of the new NAAQS for ozone and fine particles and the forthcoming regional haze program.

The Subcommittee did not reach consensus on an overall package of recommendations drawn from the issue papers. The FACA process was designed to provide EPA with advice and recommendations. It did not require a final product binding on all parties, as in a negotiated rulemaking process. The Agency recognized that time constraints would prevent achieving full consensus on so many complex issues. It is important to recognize that these members volunteered a significant amount of their time to address these implementation issues and were successful in developing a full range of options for discussion. Although the discussions produced innovative and creative options, in many instances, the Subcommittee could not reach agreement on a recommendation. The Subcommittee recognized at the outset that, for some members, the ability to accept a recommendation on one issue was contingent on the development of a comprehensive package of recommendations. However, following the issuance of the Presidential Directive, the Subcommittee decided to focus on the implications of the Directive on the issue papers rather than develop a comprehensive package.

In general, differences between environmental/public health and industry members centered around perceived tradeoffs between more cost-effective strategies and more expeditious attainment of the standard. The State regulatory representatives were concerned with the scientific uncertainty associated with control measures, meeting their regulatory responsibilities in a less burden-

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some way, and pursuing strategies that provide greater regional/State/local flexibility. Because of these differences in positions, developing proposed strategies that satisfied all groups was a major challenge of the Subcommittee.

THE CHARGE TO THE SUBCOMMITTEE

The FACA Subcommittee received its initial charge upon its formation in September 1995. This charge was clarified during the CAAAC meeting in December 1996 and in letters from EPA Administrator Carol Browner and the Subcommittee co-chairs Alan Krupnick and John Seitz. The charge to the Subcommittee comprises a number of specific instructions relating to the issues the Subcommittee should and should not consider. The six charges to the Subcommittee are listed below:

1. *Develop recommendations to EPA regarding integrated programs for attaining new/revised ozone and PM NAAQS and making reasonable progress under the regional haze program.*

2. *Develop integration strategies to meet new standards that do not interfere with progress being made toward current standards.*

3. *Focus on relevant implementation issues, not issues related to standards or other titles of the Clean Air Act.*

4. *Strive for innovative, cost-effective, and creative approaches.*

5. *Define national and regional strategies. Avoid site specific, individual source issues and parochial concerns.*

6. *Explore all voluntary approaches.*

The following section discusses the success of the Subcommittee in meeting each of the components of its charge.

1. Develop Recommendations to EPA Regarding Integrated Programs for Attaining New/Revised Ozone and PM NAAQS and Making Reasonable Progress Under the Regional Haze Program

This directive was the Subcommittee's primary, overarching charge. The Subcommittee considered many complex questions related to developing a comprehensive program to address all three air pollution problems. For example:

- Program timing: Should ozone designations be delayed until PM-2.5 monitoring data are also available? To what extent should regional haze program implementation be integrated with the PM-2.5 program?

- Regional planning: Should new regional bodies be formed to address all three programs together? If so, what should be the membership, authorities, and regulatory responsibilities of such groups.

- Technical tools: Can certain activities related to emission inventories, modeling, and monitoring be integrated across programs?

- Control strategy development: What strategies will benefit more than one program? What control technologies will reduce emissions of multiple pollutants?

The Subcommittee recognized that there is a scientific basis for pursuing the integration of implementation programs for ozone, PM, and regional haze. Evidence shows that air pollution can be transported long distances, and that many of the emission precursors, atmospheric processes, and spatial patterns of ozone and fine particles (and the resulting regional haze) are common or similar. It was recognized that there are important information gaps and technical challenges to integration of the programs.

In order to address air quality problems caused primarily by regional transport, a central topic of discussion by the Subcommittee was the concept of designating both an Area of Violation (AOV), or the area in which a NAAQS is exceeded, coupled with an Area of Influence (AOI), a broader area including sources that potentially contribute to downwind NAAQS violations. The concept was also discussed with respect to regional haze, whereby AOIs could be developed for the 156 mandatory Class I Federal areas. To support an integrated approach to these interstate air pollution problems, the Subcommittee also discussed the creation of regional air management partnerships (RAMPs). In concept, RAMPs would be composed of multiple States and tribes working collectively to address regional air pollution problems. Consensus was not reached on the elements of the AOI/AOV/RAMP structure. The Subcommittee recognized the benefits of creating a body that would focus on the regional nature of

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many current air quality problems. However, some members of the Subcommittee raised concerns that this approach could delay clean air, since, among other things, a heavy focus on emissions from other jurisdictions may be premature until regional pollution is better understood and could well result in a deferral of necessary local emission controls.

The Subcommittee investigated potential program integration by looking at the primary elements of the implementation process. These elements include air quality monitoring, designation of areas not complying with the air quality standard, establishment of the attainment date, use of an air quality classification system, and development of the implementation plan that details the emission management strategies to be used in addressing the air quality problem.

Ambient monitoring data for ozone are readily available for numerous sites nationally, enabling the States to make nonattainment designations expeditiously. For PM-2.5, there are data in some locations, but PM-2.5 data collected according to the Federal Reference Method will not be available for several years. For regional haze, about one-third of the Class I areas have been monitoring PM-2.5 or other visibility-related parameters for several years. In light of the varying availability of air quality data for the three programs, the Subcommittee discussed the potential inefficiencies in the development of multiple implementation plans. However, the Subcommittee agreed that delaying ozone implementation while the monitoring network for PM-2.5 is being deployed would not be acceptable. Some Subcommittee members also objected to delays in regional haze program implementation because some areas with regional haze problems will not have a corresponding violation of the NAAQS, and the GCVTC has already spent 5 years developing recommendations that should not be delayed. In contrast, some other members felt that the regional haze proposal was sufficiently ill defined as to warrant reconsideration/reproposal by the Agency. A delay in ozone and regional haze implementation would also be inconsistent with the first Content-Related Principle, which states:

> *Progress toward attainment of revised NAAQS and achievement of regional haze program requirements should be achieved in an expeditious manner. Timetables for achieving progress should be informed by consideration of a number of factors, including health and environmental benefits, cost and technical impediments, available scientific information, requirements of the CAA, and administrative requirements.*

In addition, those areas having information showing a likely nonattainment problem for PM-2.5 are encouraged to pursue integrated planning and implementation for all three programs, consistent with the eighth Content-Related Principle:

> *Opportunities for integration of planning and implementation for ozone, PM, and haze that achieve better environmental results and lower costs should be fully pursued.*

There was agreement that EPA should develop guidance for technical tools, such as air quality monitoring, atmospheric modeling, and emission inventory development, in a way that facilitates integration across the three air pollution programs. In addition, the Subcommittee repeatedly recommended that EPA develop these materials in a timely manner.

2. Develop Integrated Strategies to Meet New Standards That do not Interfere With Progress Being Made Toward Current Standards

The second charge to the Subcommittee was to develop implementation approaches that assure continued air quality progress. Implementation of new air quality standards should not reduce the effectiveness or delay implementation of existing programs that are based on the previous standards for ozone and particulate matter. Early in its deliberations, the Subcommittee endorsed the continuation of present efforts to reduce emissions in order to attain the current standards. This endorsement is found in the fifth Content-Related Principle, which states:

> *Assure timely environmental progress. Timely environmental progress means, at a minimum, continuing air quality improvements at a rate no less rapid than will be required to meet the current NAAQS. Early Federal, State and local actions to improve PM fine air quality should be encouraged.*

The Subcommittee endorsed another set of principles to inform EPA's development of the interim implementation guidance. The interim guidance will be used by EPA to continue implementation of the 1-hour ozone and PM-10 nonattainment programs following promulgation of new and revised NAAQS. The assumptions on which the

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Subcommittee based these principles, as well as the principles themselves, express the consensus for a continuation of present efforts to reduce emissions. The relevant assumptions include: 1) all 15 percent plans for ozone should comply with existing policies since they were due in November 1993 and were to have achieved all of the reductions before the standard changed; and 2) the 3 percent per year requirement for ozone is a good way to continue progress during the interim period while new area boundaries are being designated and new implementation strategies are being developed.[2] The Subcommittee's principles for the interim implementation guidance express an intention to prevent "backsliding" by requiring continuation of all existing programs and all requirements to meet existing milestones for emission reductions. The guidance will be applied to areas until the 1-hour ozone and PM-10 standards are attained in such areas.

While the Subcommittee supported the continuation of present implementation programs, there was significant debate about whether or not States should implement new emissions management strategies in PM-2.5 and newly-designated ozone nonattainment areas before State implementation plans (SIPs) are due (3 years after the areas are designated). There was general agreement that national EPA programs will be important to achieving the new standards. The EPA was encouraged to continue national efforts to contribute to progress during SIP development. The Subcommittee generally agreed on the desirability, in principle, of early emissions reductions. Environmental/public health representatives advocated for guaranteed progress before completion of the SIP development and approval process. State and industry representatives supported voluntary early reductions and stressed the need for additional scientific information in developing new emission management strategies.

3. Focus on Relevant Implementation Issues, not Issues Related to Standards or Other Titles of the Clean Air Act

The Subcommittee examined numerous implementation issues relating to both the existing programs and potential future programs for ozone, PM, and regional haze. This section provides an overview of several of the key issues addressed by the Subcommittee and highlights some of its most important debates. The section begins with a brief description of the Federal and State air quality planning process for the NAAQS and visibility issues.

Overview of the Air Quality Planning Process

The EPA currently designates areas violating an ozone or PM NAAQS as nonattainment based on air quality monitoring data and classifies the nonattainment areas according to the severity of the areas' air quality. States then develop a SIP which contains the control strategies, economic incentives, and other programs the State will use to attain the NAAQS. In addition, State's are required to implement the Act's visibility protection programs through their SIPs. The SIPs must demonstrate that the State will work toward attainment or visibility improvement goals at a reasonable rate (referred to as Reasonable Further Progress (RFP) for the NAAQS and reasonable progress for visibility goals). Attainment of the NAAQS is to be achieved as expeditiously as practicable, but no later than the date established by the CAA. The SIPs must also contain contingency measures to be implemented if RFP is not achieved. The SIPs must also include a new source review (NSR) program for controlling emissions growth from new or modified large stationary sources located within nonattainment and attainment areas, including areas potentially affecting Class I areas. Finally, SIPs must establish a motor vehicle emissions budget to be used in transportation conformity analyses. States that fail to submit approvable plans or implement their plans are subject to sanctions. States that fail to attain the standard by the required date must conduct additional planning and implement additional control requirements.

Air Quality and Emissions Monitoring

The Subcommittee identified barriers to the collection of air quality monitoring and emissions data by the States and reached broad agreement that existing source and ambient monitoring efforts should be increased and improved. The Subcommittee showed strong support for chemical composition analysis of samples used to monitor PM-2.5 emissions and air quality to enable States to better target emission reduction strategies to the proper source categories. To address the need to expand monitoring and data analysis programs in the States, the Subcommittee made several recommendations. First, it urged EPA to provide adequate new Federal funding to ensure there are sufficient resources to support any new activities. Second, it

[2] U.S. Environmental Protection Agency, Subcommittee for Ozone, Particulate Matter and Regional Haze Implementation Programs, "Interim Implementation Policy Principles for the Transition from Old National Ambient Air Quality Standards (NAAQS) to the New NAAQS" (October 1, 1996).

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recommended that EPA revise its guidance to allow the use of Title V fees for ambient air monitoring and data analysis. (The Subcommittee acknowledged that other fees—including non-Title V and mobile sources—can also be used by States for these purposes). Finally, it recommended that EPA encourage the formation of public-private partnerships, allow the use of both public and private monitoring data to clarify boundaries and analyze the chemical makeup of PM, accelerate the deployment of PM-2.5 source measurement and ambient monitors, and accelerate the assembly of comprehensive regional emission inventories.

The Subcommittee also explored ways to remove another obstacle to increasing monitoring activities: the linkage between monitored air quality violations and subsequent requirements for planning and emission controls (including NSR). The Subcommittee, however, could not reach consensus on a proposal to decouple specific pollution control requirements from air quality violations.

The Subcommittee agreed that air quality models are an important tool for predicting the effect of changed emissions on air quality. The EPA guidelines for model selection should provide for the choice of the most appropriate, peer-reviewed models applicable to analysis of a specific air quality problem, including both the identification of areas that influence present air quality standard violations as well as the evaluation of proposed emissions control plans. The Subcommittee did not reach consensus on the degree of flexibility to be afforded in model selection. While uncertainties remain in the air quality modeling process, methods now exist that can and should be used to quantify these uncertainties so that they can be taken into account at the time that emissions control decisions are made. At the present time, a key step toward reducing uncertainties and building confidence in model applications is to improve the quality of the source emissions inventories that are supplied to the models.

Classification Systems for Areas Violating a Standard

Prior to the Presidential Directive, the Subcommittee discussed classification systems for areas violating the standard. A classification system can be used to achieve three primary objectives. First, classifications can be used to inform the public of air quality conditions and the associated health risks. Second, classifications can be used to differentiate between increasing levels of air quality severity and accompanying attainment dates and implementation plan requirements. Third, a classification can carry a set of mandated control requirements. The Subcommittee discussed that, under a new AOI/AOV construct, a classification system could be used to differentiate between air pollution problems dominated by transport versus local sources.

The Presidential Directive defines a new transitional classification for ozone, recognizing that some nonattainment areas are projected by EPA to attain the new ozone standard upon implementation of the regional NO_x strategy that EPA recently proposed. The Subcommittee recommended no additional classification scheme for ozone beyond the transitional classification established in the Presidential Directive. Following the issuance of the Presidential Directive, the Subcommittee agreed that designing a PM-2.5 classification scheme would be premature until more PM-2.5 data are available. In addition, the Subcommittee did not discuss how the AOI/AOV concept could be combined with the new transitional classification. The Subcommittee acknowledged the benefits of classifications to communicate air quality problems to the public, but did not reach agreement on whether this or other methods should be used to achieve this objective.

Attainment Dates

The CAA states that an area violating the NAAQS must achieve the standard as expeditiously as practicable but no later than 5 years from the date of designation. If warranted, the EPA may extend the attainment date for another 5-year period. Two additional 1-year extensions may be permitted. Early in its discussions, the Subcommittee addressed the issue of whether or not there should be an attainment date at all and concluded that at a minimum there should be a date-certain for attainment. This recommendation is embodied in the third Content-Related Principle, which states:

> *All options/recommendations must be based upon specified deadlines for planning, implementing and attaining the NAAQS and implementing regional haze program requirements.*

The Subcommittee debated different schedules for attainment and sanctions for failure to attain the standard on schedule. Some members claimed that some areas designated as nonattainment for the 1-hour ozone standard would require 10 years to complete the implementation process necessary for attainment, especially areas that have already implemented the more straightforward control

measures. This process includes improving emissions inventories, conducting atmospheric modeling, assessing trends, adopting regulations requiring control measures, and evaluating progress.

While the Subcommittee acknowledged the possible need for a 10-year process in some locations with complex problems, it also agreed that many newly-designated areas could achieve air quality benefits in less time. Areas that have complex air quality problems could apply for the 5-year extension. However, the Subcommittee recommended that granting the extension should be contingent upon the States' timely development of a good plan, a demonstration of need for additional time, and expeditious action in implementing controls.

One unresolved issue concerns the timing of compliance assessment in relation to the 5-year period for attainment under the CAA. Compliance with the new 8-hour ozone standard is determined with 3 years of air quality data. While the work group issue paper recommended that this 3-year compliance period be after the 5-year attainment period, the Subcommittee did not reach agreement on this recommendation.

Progress During Air Quality Planning by States

The Subcommittee discussed the progress in air quality improvement during the time between promulgation of the new NAAQS and submittal of State control strategies. Some Subcommittee members believed existing ongoing efforts (including the acid rain program, the Federal hazardous air pollutant control program, mobile source emission control measures, and the implementation of measures to meet the existing standards) represented sufficient progress. Other Subcommittee members identified a potentially long period during which additional measures could be identified and control strategies should be implemented. The Subcommittee agreed that areas that violate the NAAQS should address the problem expeditiously, including such activities as emissions inventory development, collection of monitoring data, and coordination with other involved parties. It was generally agreed that action could include implementation of State/local control measures prior to Federal approval of the SIP. These controls could vary according to the specific circumstances of the air quality problem. For example, strategies could vary depending on the pollutants principally responsible for the problem, and whether the problem is primarily caused by local sources or transported pollution. But consensus was not reached on whether pre-SIP pollution control actions should be required.

Regional Haze

The Subcommittee discussed implementation of a regional haze program to make reasonable progress toward the national goal of no manmade impairment of visibility in mandatory Class I Federal areas. The Subcommittee endorsed various criteria that can be used to determine if reasonable progress is being achieved. The group recommended that States and tribes include long-term strategies for assuring continued progress in their plans. The group also recommended the allowance of innovative strategies to address the requirement for best available retrofit technology (BART). There was general agreement that all measures that improve visibility should be counted in assessing reasonable progress (including title IV). The work group recommended using stakeholder input in establishing Class I area visibility targets, but some Subcommittee members also suggested establishment of a "Federal backstop" rate of progress.

Transportation Conformity

Prior to the Presidential Directive, some members discussed how and where transportation conformity should apply in areas that potentially violate or potentially contribute to a violation of the NAAQS. The scope of the discussion was limited to the issues that are unique to the application of transportation conformity to the presumably larger areas contributing to NAAQS violations which may in some cases include more rural areas, and which would likely be subject to additional emissions control requirements to attain the new standards.

4. Strive for Innovative, Cost Effective, and Creative Approaches

Innovative and creative approaches, by definition, include, but are not limited to, approaches that go outside of the legislative and regulatory "boxes" that have been created by the CAA and associated EPA implementation guidelines and rules. The Subcommittee was continually urged to think outside of these boxes. During the course of the deliberations, the Presidential Directive was issued, which created another "box." In regard to potential options that could affect statutory requirements, the Subcommittee agreed to the fourth Content-Related Principle:

> *All options/recommendations which may require amendments to the CAA must be clearly identified with advantages and disadvantages for such changes analyzed.*

In an effort to promote innovative thinking, EPA initially proposed an approach where the statutorily-prescribed minimum control measures in subpart 2 of title I, part D of

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the CAA would cease to apply to existing nonattainment areas following revision of the ozone standard. After considering comments on this proposal, EPA concluded, based on legal and policy factors, that the requirements of subpart 2 would continue to apply to existing nonattainment areas until the 1-hour standard is met.

The Subcommittee discussed a number of proposals that would require legislative changes, regulatory changes, or changes to the Presidential Directive. In addition, the Subcommittee considered the Clean Air Investment Fund, elaborating on this concept as it was earlier discussed in the Subcommittee and as it appeared in the Presidential Directive. Consensus on specific innovations was generally not sought. However, there was recognition that more effective accountability mechanisms are essential under approaches that rely on greater flexibility and use of economic incentives.

The following subsections highlight some of the most innovative proposals discussed by the Subcommittee. Although the Subcommittee did not reach consensus on all of the proposals because some members believed that they did not provide adequate safeguards to ensure against abuse or inaction, or did not fully consider the associated costs, the discussions often highlighted areas in the current implementation process where improvements could be made.

The Designation Process

The Subcommittee spent a great deal of time discussing the designation process and the problems with the current process when dealing with regional air quality problems. A proposal was developed and fully discussed that distinguished between the area experiencing an air quality problem (area of violation) and the area contributing to the problem (area of influence). This concept recognized the regional nature of air pollution in an innovative way and, if implemented as envisioned, could provide a cost-effective means for reducing regional levels of air pollutants. However, endorsement of the approach was not reached because of differing opinions about whether the approach was needed in many areas, the risk of delay to allow for regional planning, and the nature of mandatory measures to be imposed within the area of violation.

Incentives for Increasing Air Quality Monitoring

The Subcommittee explored creative ways to increase air quality monitoring activities. Increased monitoring is needed to meet several objectives: to characterize air quality in areas outside existing nonattainment areas (e.g., rural or suburban areas); to better characterize background levels of air pollution; to increase the understanding of pollutant transport; and to better characterize an area of violation or area of influence. Monitoring and subsequent chemical analysis provide important information on the sources or types of sources contributing to air quality problems. Increasing the quantity and analysis of air quality data was supported by the Subcommittee as a necessary tool in the development of cost-effective control strategies. Installation and operation of these monitors can be expensive, often a significant portion of a State or local air quality agency's budget. Once an area is identified as violating the NAAQS, the area is required to begin a planning process and to implement control measures to bring the area into attainment. A number of State and local officials, in addition to private industry, are reluctant to install monitors beyond those that are required because of concerns about being labeled "nonattainment" and potential additional planning and control requirements.

The Subcommittee debated the need to increase monitoring against the level of action required when a violation is observed. Some members advocated a new policy for decoupling planning and control requirements from monitored violations for a limited period of time. It was proposed that the decoupling would remove the disincentive to monitoring, and that the incentives to better characterize air quality would remain. Other members supported increased mandatory requirements for additional monitors rather than developing incentives for an action that air pollution control agencies are obligated to perform. Increasing the required number of monitors would ensure the necessary monitors were installed. Agreement was not reached.

Reasonable Further Progress

The Subcommittee supported two innovative changes in the RFP requirements. First, the Subcommittee supported the use of multiple metrics to measure progress in air quality. Second, the Subcommittee supported an opportunity for a mid-course correction in the implementation of a control strategy to account for changes.

For existing ozone nonattainment areas, the CAA contains a specific definition of minimum required RFP—3 percent per year reductions in emissions of ozone precursors. Some Subcommittee members regard these requirements as inflexible in both the metric used to quantify progress (emission reductions) and the rate at which progress must be achieved (3 percent per year). Although emissions reductions are needed to assure improved air quality, the

Subcommittee recognized the deficiencies in the current emissions metric, even if there was not agreement reached on alternative or supplementary metrics. One problem is that the current metric treats all tons of emissions reductions alike. It does not recognize that the effect of reducing emissions of a particular pollutant can vary with source location, source emission height (e.g., tall stacks versus vehicles), species (for VOC), and timing (e.g., day versus night, hot days versus cooler days). The option of substituting ambient pollution concentrations as a metric was rejected as a year-to-year strategy because of the difficulty of distinguishing changes in concentrations based on emissions reductions from those resulting from weather variability. The Subcommittee considered defining a new metric based on effective emissions reductions (which would capture the location, height, and other distinctions but still be emissions based).

Some Subcommittee members hold that the current metric also does not permit advanced credit toward RFP today for control strategies that do not bear fruit for several years (e.g., implementing a mass transit system), biasing control strategies against transit, landuse changes, and other end-loaded strategies. There was consensus on the need to develop an approach to permit, with appropriate safe-guards, credit for end-loaded strategies.

The Subcommittee recommended that emissions reductions continue to be the primary metric for measuring progress, supplemented by considerations of ambient air quality. The Subcommittee also called for a new workshop to examine the metrics issue further. There was consensus on local areas deciding whether reductions in NO_x or VOC or both were best for meeting the ozone standard in a particular area.

The Subcommittee recognized the increasing cost of improving air quality and the uncertainties associated with the design of control strategies. A consensus of the Subcommittee was that a reasonable approach to achieving the air quality standards is to adopt strategies on a timely basis but provide for a mid-course evaluation and, if necessary, a correction in the control strategy. The use of a mid-course correction was widely endorsed by the scientific community. Whereas the chemical mechanisms and pollutants that form ozone are relatively well under-stood, the scientific understanding of fine particles and their relationship to ozone is expected to improve substantially in the next few years. A mid-course correction will allow State and local agencies to modify control strategies if the scientific understanding indicates a more cost-effective approach. In addition, the seventh Content-Related Principle states:

> *All options/recommendations should provide for the use of best available, scientifically-based explanations to be used in planning requirements and control strategy development. Such options/ recommendations should include methods to identify the role of non-local transport processes and mechanisms designed to address such processes.*

Economic Incentives

The Subcommittee went beyond the conventional discussions of emissions trading programs for large stationary sources, such as electricity-generating stations, and explored incentive-based control measures for all types of sources, especially area and mobile sources. The Subcommittee produced a framework for analyzing incentives, a survey of preferences for incentives for early emissions reductions, suggestions for programs for achieving early reductions, and suggestions for the design of clean air investment funds.

The framework is a general guide for air quality regulators who are considering use of an economic incentive to achieve an emission control objective. The framework will help them identify many of the significant technical and political issues that arise when determining whether to use an incentive-based mechanism.

The Subcommittee identified the general issues which are important to address to ensure that incentives for early reductions provide for real emissions reductions and achieve air quality progress at a more rapid rate while still delivering lower costs. To assist the Subcommittee, the Connecticut Department of Environmental Protection conducted a survey of National and Regional Strategies Work Group members. Among other things, the survey provides information on the potential effectiveness and acceptability of several specific incentives for early reductions. The Subcommittee examined a number of early reduction programs including: “safe harbors” (a grace period during which a regulatory agency does not seek additional reductions) and emissions trading systems with banking.

The Presidential Directive calls on EPA to encourage air regulatory agencies to establish clean air investment funds, which allow sources with control costs (for ozone or

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particulate matter) exceeding a certain level the option of paying a fee at that level instead of making on-site emissions reductions. The manager of the fund would then use money from the fund to seek less expensive emissions reductions of equal or greater magnitude. The Subcommittee discussed general design principles and the most important issues to address when creating a fund, such as the threshold for paying into the fund and using the fund.

The Subcommittee reached consensus on the following recommendations:

1. Both economic incentive programs and traditional programs should be evaluated with a common objective: assurance that the intended environmental results will be achieved.

2. The EPA and the States should identify methods to encourage adequate planning emphasis for economic incentives where appropriate, so that they are considered among the initial approaches when developing a regulatory program.

3. The CAAAC, through its other standing committees, should ensure the further development of economic incentive approaches to achieve air quality goals.

4. The CAAAC should encourage the EPA to develop appropriate policy guidance so that local, State, and regional authorities can efficiently develop and implement economic incentive programs.

5. The use of demonstration or pilot projects should be encouraged, through appropriate means, to provide information for the development of innovative emission control programs.

The Subcommittee reviewed the unique concerns of small business sources which will face compliance challenges under the revised NAAQS. While no consensus was reached on a specific strategy, support was expressed for flexibility in employing economic incentive programs as appropriate. In many cases, small business assistance programs offer an efficient use of resources at the State level to provide information and compliance assistance to small sources.

Control Strategies

The Subcommittee also looked at ways to promote innovation in specific control strategies. The Subcommittee began devising a process for allocating emission reduction responsibilities among national measures, measures for nonattainment areas (or areas of violation) as prescribed by EPA, and measures implemented at the discretion of State and local agencies. There was discussion of the need to identify the appropriate "level of governance" for specific measures. Some measures were specifically identified as appropriate for the Federal government, such as measures dealing with products in interstate commerce (consumer products and cars).

After July 1997, the Subcommittee continued discussions to offer recommendations on control strategies issues that remained unresolved by the Presidential Directive. The Subcommittee agreed that national measures that are clearly identified and required by the CAA should continue to be adopted and implemented according to statutory direction and deadlines. The Subcommittee also discussed, but didn't agree on, the level of discretion an air quality authority should have in adopting those additional control strategies (including innovative and nontraditional strategies) needed to meet an area's air quality objectives. When the strategy fails to show reasonable further progress prior to attainment, or attainment by the attainment date is not achieved, Federally-mandated contingency measures kick in. The Subcommittee's position on the Federal role is consistent with the second Content-Related Principle which recognized the need for Federal action:

> *In the event of State or other responsible institution's failure to plan (or to participate in planning) and implement plans, within the designated timeframes, the Federal government must take timely action to remedy the situation.*

The Subcommittee discussed one possible approach to implementing control strategies that would provide substantial flexibility in the development of initial plans. The framework would apply in areas with 10-year attainment dates, requiring SIPs 3 years after nonattainment designation that include: 1) an attainment demonstration sufficient to determine emissions reductions needed; 2) control strategies chosen by the State, including any mix of traditional measures and nontraditional measures with an estimate of the emissions reductions expected 4 years after the SIP is submitted; and 3) contingency measures sufficient to ensure attainment by the attainment date should the nontraditional measures prove deficient. A number of Subcommittee members objected to this proposal, asserting among other things that

there is too much time allowed before the backstops kick-in, an overreliance on the contingency measures, and a need for a minimum up-front control obligation.

Control strategies should be developed in light of the sixth Content-Related Principle endorsed by the Subcommittee:

> *Control strategies should be effective in achieving air quality objectives, should be designed to accommodate flexible response methods by emission sources, and should encourage continuing improvements in air quality.*

5. Define National and Regional Strategies. Avoid Site Specific, Individual Source Issues and Parochial Concerns

The Subcommittee explored the legal basis, membership, authority, and roles of multi-jurisdictional institutions to address regional air quality problems. The Subcommittee's recommendations regarding the structure, operations, and functions of regional institutions provide the institutions' participants with the flexibility to tailor their programs to the nature and scope of the region's air quality problem. The Subcommittee recognized that States and tribes would continue to be responsible for local air pollution problems and to develop and implement control plans, while regional institutions would be formed to focus on consistent regional approaches. The institutional mechanisms would provide stakeholders with the opportunity to participate in solving the region's air quality problem, which is consistent with the ninth Content-Related Principle:

> *Planning and implementation proposals should identify methods for early and continued involvement of potentially affected interests, to the maximum extent possible, to assist in the attainment of the revised NAAQS and achieving reasonable progress toward regional haze program goals.*

The Subcommittee considered a new mechanism developed by one of its work groups, the RAMP concept, as an approach to provide States and tribes with a forum for reaching agreement and developing recommendations on how to solve regional air pollution problems. A RAMP would be composed of States and tribes that share air quality concerns and characteristics. The RAMPs would coordinate air quality analyses, share air quality information such as monitoring and emissions data, and develop consistent regional emissions reductions strategies. The EPA could establish or recognize RAMPs using its authority provided by the CAA to set up organizations to address air pollution problems spanning multiple States and tribes. The RAMPs would include voting representation from States, locals, tribes, and nonvoting participation by EPA, Federal cabinet-level resource managers (where appropriate) and private sector stakeholders. The Subcommittee also recognized the benefits of public education and awareness programs.

6. Explore all Voluntary Approaches

The Subcommittee explored several voluntary approaches pertaining to air quality monitoring, areas at risk of violating a national air quality standard, and incentives for early reductions. In addition, the Subcommittee recognized the potential value of voluntary approaches to reduce emissions, but some concerns were expressed about granting SIP credit to such approaches.

The Subcommittee recommended certain voluntary approaches to increase and improve monitoring activities. It was recommended that regulatory agencies should have the ability to use public *and private* monitoring data. Businesses may have an increased incentive to develop and manage their own monitoring programs, particularly in areas designated as nonattainment or identified as a potential contributor to a downwind nonattainment area. The Subcommittee also encouraged public-private partnerships to fund and operate additional monitoring. For example, partnerships could be formed among EPA, health care organizations, public interest groups, private foundations, industry, and Federal land managers such as the Department of Interior.

The Subcommittee also discussed voluntary actions that can be taken to prevent an area from violating a NAAQS. In the past, EPA policy has not required areas to take significant steps toward improving air quality until a violation of an air quality standard is monitored. To provide greater protection of human health and minimize the administrative burden on State and local agencies, the Subcommittee sees the need for EPA to encourage and assist States in developing programs for areas that are believed to be trending toward an air quality standard violation. Assistance could be in the form of technical help in interpreting air quality trends or providing examples of actions other areas have taken to avoid a violation. States and regional planning bodies should be given appropriate discretion in designing these proactive programs. Ozone action days and flexible attainment regions are examples of current efforts that promote voluntary early reductions.

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The Subcommittee recognized that some voluntary approaches increase the public's awareness of the general effects of their actions on air quality.

The use of voluntary approaches was also discussed by the Subcommittee as a potential element of an area's overall emissions reductions strategy to attain the standards or make reasonable progress toward the national visibility goal.

The fault line running between flexibility and environmental risk was never more in evidence than in the discussion of voluntary measures. The Subcommittee agreed that voluntary measures can result in emissions reductions, but members distinguished between approaches based on the degree of certainty that an approach would in fact result in real, enforceable, and quantifiable reductions. Some Subcommittee members supported an approach providing States with flexibility in developing control strategies that include voluntary approaches, provided that these States adopt in advance a set of contingency measures sufficient to bring the relevant areas into attainment. Consensus was not reached on this approach.

Public interest representatives felt that public health and the environment were being put at too great a risk to permit the use of voluntary measures for credit in the SIP. The Subcommittee discussed the use of surveys and statistical analysis to predict emissions reductions that could be achieved for various levels of voluntary changes in behavior. There was not agreement whether this approach would provide adequate assurance for SIP credit.

PRESIDENTIAL DIRECTIVE

The July 1997 Presidential Directive provides "a road map for areas to attain the standards and protect public health without sacrificing economic growth."[3] Specifically, it set forth the following goals:

- Maintain the progress currently being made toward cleaner air and respect the agreements and technological progress already made by communities and businesses to pursue clean air;
- Reward State and local governments and businesses that take early action to reduce air pollution levels through cost-effective approaches;
- Respond to the fact that pollution can travel hundreds of miles and cross many State lines;
- Work with the States to develop control programs which employ regulatory flexibility to minimize economic impacts on businesses large and small to the greatest possible degree consistent with public health protection;
- Minimize planning and regulatory burdens for State and local governments and businesses where air quality problems are regional, not local, in nature;
- Ensure that air quality planning and related Federal, State, and local planning are coordinated; and
- Recognize the substantial lead time necessary for State and local governments and businesses to plan for and meet standards for a new indicator of PM.

The Subcommittee had been engaged in discussion for a year and a half prior to the Presidential Directive. The goals of the Directive include several themes that were recommended by the Subcommittee in their Content-Related Principles. Principally, the Directive recognized the linkages between ozone and PM, their precursors, and regional haze problems. It described the importance of pollutant transport and supported the need for regional air quality strategies to address ozone, PM, and regional haze problems. The Directive outlined a proposed regional NO_x strategy for the Eastern U.S. based on the results of the OTAG process.

The Presidential Directive defines a new transitional classification for ozone, recognizing that some nonattainment areas will attain the new ozone standard upon implementation of the regional NO_x strategy that EPA recently proposed.

The Directive recognized the need for State and local governments to have sufficient time to collect PM monitoring data before designating PM-2.5 nonattainment areas. The Directive set the timeframe for the designation of PM-2.5 nonattainment areas as 2002-2005 (after EPA completes a review of the PM-2.5 standard).

Finally, the Directive suggested the development of a clean air investment fund to provide a safety valve for sources with high compliance costs.

[3] U.S. President, Memorandum, "Implementation of Revised Air Quality Standards for Ozone and Particulate Matter," 62 FR 38423, No. 138, July 18, 1997.

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CONCLUSION

The Subcommittee was a forum for an informative national debate on air quality management implementation issues. The Subcommittee was successful in meeting its overall charge: it provided an extensive set of options and recommendations to EPA regarding implementation programs for attaining the new and revised ozone and PM NAAQS and making reasonable progress toward the national visibility goal under the visibility program. The Content-Related Principles were a significant product of consensus by this body. In conjunction with recommendations from OTAG, the Ozone Transport Commission, and GCVTC, the Subcommittee's discussion of the need for regional coordination of air quality planning and emissions reductions throughout airsheds appears to recognize the need for a fundamental change in the design of emission reduction strategies. There is now broad agreement that for nonattainment areas and Class I areas impacted by pollutant transport, it will be insufficient to confine planning and control measures to a relatively limited area, such as the boundaries of a nonattainment area. The Subcommittee recognized that planning and control strategy development must address not only areas measuring violations but also areas contributing to violations.

The Subcommittee debated the extent to which these three programs could be integrated. It recognized that there is a scientific basis for pursuing program integration because of evidence showing that air pollution can be transported over significant distances, and that many of the emission precursors, atmospheric processes, and spatial patterns of ozone and fine particles (and the resulting regional haze) are common or similar. The Subcommittee agreed that EPA should not force the integration of implementation schedules and deadlines. The Subcommittee also emphasized the need for chemical composition analysis of PM-2.5 for effective strategy development, and the need for policies to create incentives to expand monitoring. It also recommended that new guidance and tools, particularly for emissions inventories, modeling, and monitoring, should be developed that will support future integrated analyses and implementation.

The Subcommittee addressed a broad range of relevant implementation issues and identified and developed numerous innovative, cost effective, and creative approaches for implementing these air quality programs. The Subcommittee repeatedly supported the need to continue the rate of air quality improvement needed to achieve the "old" ozone and PM standards (i.e., those in place before July 1997), and it discussed ways to ensure early progress toward attaining the new standards. It provided recommendations on mechanisms for regional planning approaches, on the potential use of other metrics for tracking progress, and on new market-based mechanisms that can reduce the costs of compliance. The Subcommittee discussed voluntary approaches to reducing pollutant emissions, but was not able to develop consensus on approaches to couple voluntary measures with necessary safeguards for action. Areas at risk of violating standards were encouraged to voluntarily implement measures. The Subcommittee did not put forth recommendations on the appropriate "level of governance" for specific control measures. Finally, the Subcommittee endorsed the Communication and Outreach Work Group's recommendations regarding the need for involving and informing affected interests in the implementation process.

Successful implementation of the ozone, PM, and regional haze programs will require substantial increases in resources for Federal, State, local, and Tribal air agencies. These resources will be needed to help fund all aspects of these programs including, but not limited to, monitoring, modeling, emissions inventories, control strategies, and enforcement. Accordingly, the Subcommittee urged that EPA, State, local, and Tribal air pollution control agencies provide and maintain new funding for all levels of government to accomplish this work.

Overall, the Subcommittee deliberations were extremely successful in educating all participants on the complexity of the issues and on the concerns of various stakeholder groups. It also highlighted the need for continued cooperation and dialogue in the development of innovative and cost-effective solutions to our Nation's air quality problems in the future.

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CHAPTER

1

Introduction

1 INTRODUCTION

The EPA established the Subcommittee in September 1995 as a part of the CAAAC, under the authority of FACA. At the time, EPA was in the process of conducting a scientific review of the NAAQS for ozone and PM and the GCVTC was developing recommendations on strategies for addressing regional haze in Class I areas (national parks and wilderness areas). Confirmation of linkages between the emissions and atmospheric processes leading to formation of ozone, particulate matter, and regional haze led EPA to initiate a process through which a broad group of stakeholders could provide advice and recommendations on new, integrated approaches for attaining the NAAQS and reducing regional haze.

The Subcommittee was formed to discuss a range of policy and technical issues (and provide consensus recommendations where possible) related to implementation programs for attaining new/revised NAAQS and reducing regional haze in Class I areas. One objective of the Subcommittee was to examine key aspects of the existing implementation programs, and to consider ways to more effectively implement these programs. Another objective was to explore innovative approaches for implementing new air quality standards and a regional haze program that could integrate broad regional and national control strategies with more localized efforts for improving air quality.

This report summarizes the major issues and recommendations discussed by the Subcommittee and its working groups from September 1995 through December 1997. This report provides a comprehensive review of the Subcommittee's work and includes some of the summary information found in the Subcommittee's *Initial Report on Subcommittee Discussions* (issued in April 1997). Table 1-1 lists the meetings held between September 1995 and December 1997.

1.1 Subcommittee Organization

The Subcommittee was ultimately comprised of eighty-three (83) members representing a broad range of interests including State, local, and Tribal governments, environmental and public health groups, industry, private consultants, academia, and other Federal agencies. A coordination group and four work groups assisted the Subcommittee. They were: the Base Programs Analyses and Policies work group (BPAPWG), the National and Regional Strategies work group (NRSWG), the Science and Technical Support work group (STSWG), and the Communications and Outreach work group (COWG). Together, the Coordination Group and the work groups involved approximately 140 additional individuals. The organization of the Subcommittee is illustrated in Figure 1-1. (Appendix A lists the Subcommittee and work group membership.) Following are the roles and responsibilities of the work groups.

Roles and Responsibilities of Work Groups

The Coordination Group was formed to provide direction to the work groups in determining the important issues and time frames to be considered by the full Subcommittee. The Coordination Group assured that the output of the various work groups was coordinated and supported the overall goals of the Subcommittee, as well as setting the agendas for the Subcommittee meetings. In addition, the Coordination Group provided the work groups with an early review of work products before they were presented to the full Subcommittee. They provided the structure for reports to the Subcommittee and the final report from the Subcommittee and served as a "sounding board" on work group products.

The STSWG's initial role was to identify the scientific foundation of integrated control strategies. They identified five topical areas and listed their major concerns within these areas. The five topics where they concentrated

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Table 1-1. List of FACA Subcommittee Meetings

Date	Location
September 26, 1995	Research Triangle Park, North Carolina
March 21, 1996	Alexandria, Virginia
May 30, 1996	Durham, North Carolina
July 30, 1996	Crystal City, Virginia
September 26 - 27, 1996	Norfolk, Virginia
October 29 - 30, 1996	Dallas, Texas
November 19 - 20, 1996	Denver, Colorado
February 20 - 21, 1997	Washington, DC
April 8 - 9, 1997	Falls Church, Virginia
June 10 - 11, 1997	Durham, North Carolina
August 13 - 14, 1997	Portland, Oregon
October 9 - 10, 1997	Chicago, Illinois
December 17-18, 1997	New Orleans, Louisiana

their discussions were 1) atmospheric chemistry and meteorology, 2) modeling, 3) ambient monitoring and data analysis, 4) emission measurements and inventories, and 5) implementation and control strategies. The STSWG also supported the other work groups by providing comments and analyses on scientific and technical issues associated with specific issue papers. A major product was the *Conceptual Model for Ozone, Particulate Matter and Regional Haze*.

The NRSWG developed a list of overarching issues to be addressed. The issues focused on broad regional and/or national strategies for addressing transport issues. The issues included institutional mechanisms to address regional transport of air pollution, development of the process for identifying areas/regions for control strategies, the process for developing control strategies that consider interpollutant and transport effects, and the means for encouraging innovative strategies (e.g. emission trading programs) in developing integrated control strategies. The issue papers where the NRSWG took the lead included: "Institutional Mechanisms for Development and Implementation of Regional Strategies," "Reasonable Further Progress," "Integrated Implementation," "Regional Haze," "The Modeling Process and Emissions Inventories: Their Development, Availability, Evaluation, Use, and Limitations," "Control Strategies," and "Using Economic Incentives to Achieve Air Quality Objectives."

The BPAPWG developed the following mission statement.

> To conduct a re-examination of the existing base regulatory program in a timeframe consistent with the implementation development schedule to take into account 1) the potential new national ambient air quality standards (NAAQS) and potential regional haze program; 2) integration, where appropriate, of broader-based regional and/or national control programs including the

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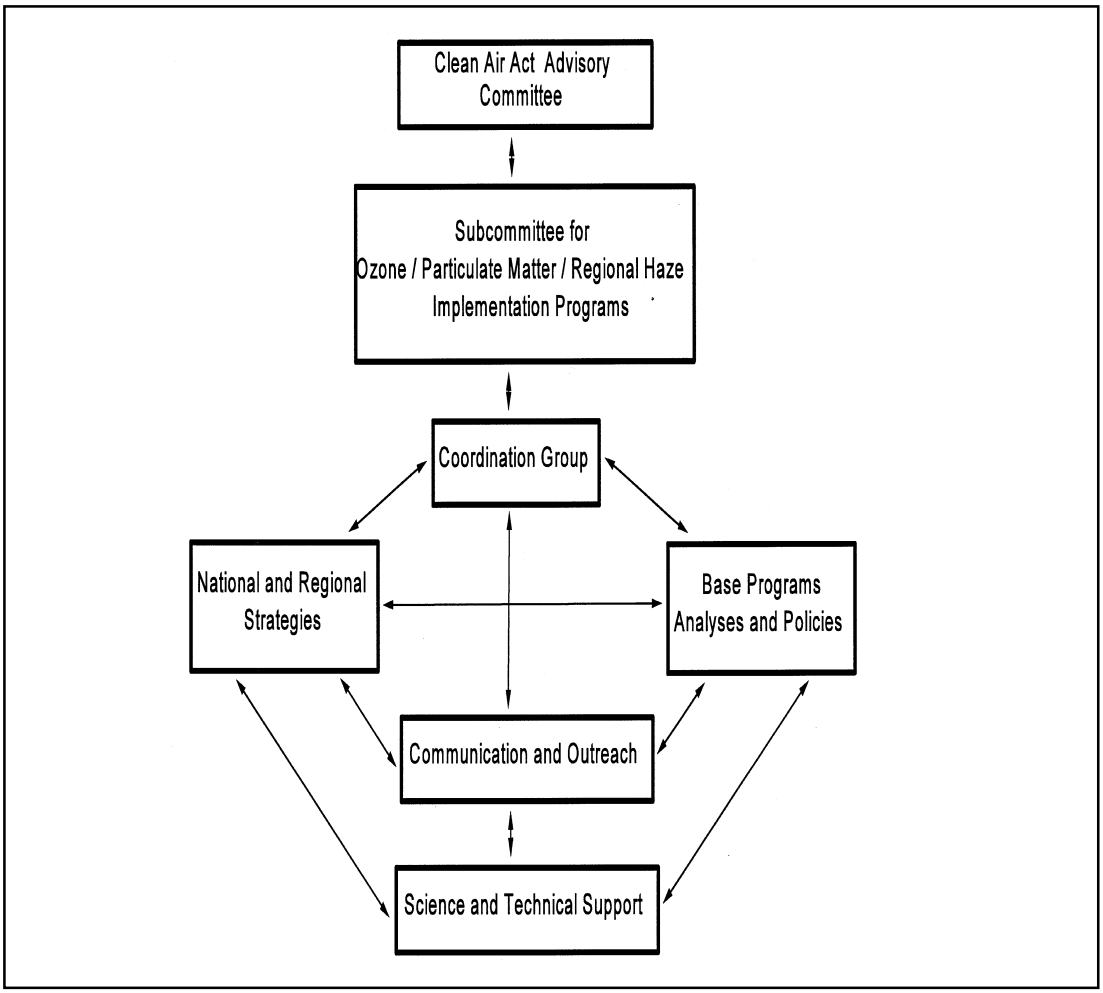
Figure 1-1. Organization of the FACA Subcommittee



perspective of both a receptor and generator of emissions with emphasis on the receptor areas: and 3) more effective implementation of the potential new NAAQS and regional haze programs.

To conduct a re-examination of the designation and classification process to better reflect the associated health risks and definition of air quality criteria pollutant problems.

To develop recommendations which facilitate moving from the existing to new programs.

The issue papers where the BPAPWG took the lead included: "Designation Issues for New NAAQS," "Area of Violation Boundaries," "Attainment Dates for New NAAQS," "Monitoring Incentives," "Classifications," "Treatment of Areas in which Air Quality Trends indicate the Risk of Violating and Ambient Standard," "Phase II Implementation Strategies for Contingency Measures," and "New Sources: Considerations for the Implementation of New Air Quality Standards/ Regulations."

The COWG developed and implemented a communication action plan for disseminating information about the Subcommittee. The COWG took the lead in the development of the "plain English" summaries of the issue papers (see Section 3 below). The COWG also took the lead in facilitating communication within the Subcommittee and work groups first through the development of a

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bulletin board on EPA's Technology Transfer Network (TTN) and then through the development of an Internet website.

1.2 Procedures for Developing Issue Papers and Presentations to the Subcommittee

Issue paper topics were assigned to the work groups based on the responsibilities of the work groups as outlined by the Subcommittee. The NRSWG focused on interstate control regions and focused on the infrastructure of regional organizations. The BPAPWG focused on intrastate control regions and current nonattainment area issues. Representatives of the STSWG played a significant role in the development of the issue papers by responding to specific technical questions from other work groups, serving on joint issue paper teams, writing sections of some papers, and providing formal comments on issue paper drafts. In some instances, the issue papers were developed jointly by two or more work groups.

The Coordination Group developed the following process-related principles to guide issue paper development:

1. Active participation is needed by all members in the work group. (EPA will take appropriate steps to assure that all work group members have an opportunity to provide input on issues prior to discussion at work group or Subcommittee meetings.)

2. Work groups need to continue striving for consensus recommendations. Consensus is defined as support for a position by a majority of members from all groups of affected interests (i.e., States, industry, public interest). Consensus does not require unanimous support of all members from affected groups.

3. If the work group cannot reach consensus on a recommendation, then the work group positions with the most support should be presented as options. Viewpoints with less support must be put in writing with a detailed rationale by the supporters of the viewpoint. When a work group sector disagrees with a position, the matter may be referred to a smaller ad hoc group for resolution.

4. Issue papers and presentations to the Subcommittee must fully describe the positions of all work group members and, to the greatest extent possible, set forth the work group's recommendations. Presentations of the work group issue papers to the Subcommittee should emphasize recommendations/options and the rationale underlying viewpoints with less than full work group support.

5. Latest drafts of issue papers and other materials to be presented to the subcommittee must be on the TTN 7 days prior to the Subcommittee meeting. (One-page summaries of issue papers may be acceptable substitutes for the full paper where no recommendations/options are being presented.)

6. The Coordination Group will, in consultation with EPA, develop appropriate principles regarding content of issue papers for the guidance of the work groups.

The work groups were given the content-related principles identified below and outlines to assist in formatting the issue papers and principles to guide the development of the issue papers. The work groups were not constrained by the requirements found in the current CAA, but were told they could "think outside the box" when developing the issue papers and recommendations.

1.3 Content-Related Principles

In order to provide guidance to the work groups, the Coordination Group proposed

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nine principles to follow when developing issue papers. The Subcommittee discussed the principles in November 1996. The final (January 24, 1997) version of the content-related principles follows.

1. Progress toward attainment of revised NAAQS and achievement of regional haze program requirements should be achieved in an expeditious manner. Timetables for achieving progress should be informed by consideration of a number of factors, including health and environmental benefits, cost and technical impediments, available scientific information, requirements of the CAA, and administrative requirements.

2. In the event of State or other responsible institution's failure to plan (or to participate in planning) and implement plans within the designated time frames, the Federal government must take timely action to remedy the situation.

3. All options/recommendations must be based upon specified deadlines for planning, implementing, and attaining the NAAQS and implementing regional haze program requirements.

4. All options/recommendations which may require amendments to the CAA must be clearly identified with advantages and disadvantages for such changes analyzed.

5. Assure timely environmental progress. Timely environmental progress means, at a minimum, continuing air quality improvements at a rate no less rapid than will be required to meet the current NAAQS. Early Federal, State and local actions to improve PM fine air quality should be encouraged.

6. Control strategies should be effective in achieving air quality objectives, should be designed to accommodate flexible response methods by emission sources, and should encourage continuing improvements in air quality. To this end, the advantages, disadvantages, and available information on cost effectiveness of a full range of control methods should be presented, including technology-based performance standards, market-based approaches, and other traditional and nontraditional approaches.

7. All options/recommendations should provide for the use of best available, scientifically-based explanations to be used in planning requirements and control strategy development. Such options/recommendations should include methods to identify the role of non-local transport processes and mechanisms designed to address such processes.

8. Opportunities for integration of planning and implementation for ozone, PM and haze that achieve better environmental results and lower costs should be fully pursued.

9. Planning and implementation proposals should identify methods for early and continued involvement of potentially affected interests, to the maximum extent possible, to assist in the attainment of the revised NAAQS and achieving reasonable progress toward regional haze program goals.

1.4 Organization of Report

This report begins with the Executive Summary followed by the Introduction and Chapter 1. Chapter 2 provides a table summarizing the general level of consensus reached by the Subcommittee on options/recommendations presented in each issue paper. Chapter 3 contains plain English summaries of the individual issue papers and the Subcommittee's overall recommendations on each issue paper. Chapter 4 provides the scientific support for development of the implementation strategies. Chapter 5 outlines

the updated strategy for the communication of findings and recommendations. Appendix A contains the final membership list of the Subcommittee, Coordination Group, and four work groups. Appendix B includes a more detailed summary of the issue papers. Appendix C contains a table outlining the Subcommittee's primary audiences and their information needs (as identified by the COWG).

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CHAPTER

2

Overview of Subcommittee Discussions

2 OVERVIEW OF SUBCOMMITTEE DISCUSSIONS

Over the course of the FACA process, the Subcommittee discussed a wide range of policy and technical issues. The discussions focused on the various products of the work groups and ad hoc groups, including the 25 issue papers that are summarized in Chapter 3 and Appendix B of this report. Each issue paper provides a background discussion on the air quality management issue of interest, identifies the range of policy options that were developed and discussed, describes selected views of various stakeholder groups, and sets forth recommendations.

The issue paper development process began in the work groups. The work groups, and sometimes smaller issue groups composed of work group members, met on numerous occasions to discuss the issues and revise the draft papers. A representative of the work group presented the issue paper and any recommendations to the Subcommittee. In general, the issue papers were presented to the Subcommittee twice—once to get early feedback before the details of the paper were drafted and a second time to obtain endorsement of a more developed set of options or recommendations. Many issue papers cycled through the work group-Subcommittee review process several times, resulting in a final product that had been discussed at length throughout much of the FACA effort.

The work groups and Subcommittee strived for consensus recommendations. "Consensus" in the FACA process was defined as support for a position by a majority of members from all groups of affected interests (i.e., States, industry, and environmental and public health groups). Consensus did not require unanimous support of all members from affected groups.

Table 2-1 categorizes the overall degree of consensus, as defined above, reached by the Subcommittee on the options and recommendations contained in the individual issue papers that were discussed.

Seven consensus categories are used: I, IA, II, III, NC, W, and D. It should be noted that the consensus categorization presented in Table 2-1 is subjective and is only meant to provide the reader with an overall sense of the level of agreement that was reached by the Subcommittee on a given topic.

The work groups and Subcommittee spent a significant amount of time discussing the issues and developing the options for papers in categories I, IA, and II. Category I represents the issue papers for which the Subcommittee reached consensus on the recommendations; in many cases the recommendations did not substantially depart from the CAA.

Category IA signifies papers for which the Subcommittee reached consensus on some of the key concepts or recommendations, but did not reach agreement on the entire set of recommendations. Category IA papers tended to contain more innovative, "out of the box" concepts than category I papers. Category II papers are those for which the Subcommittee reached agreement on the range of options, but did not reach consensus on the recommendations. These papers also included innovative approaches.

Categories III, NC, W, and D represent papers that were controversial or were hindered by time constraints. The papers for which the Subcommittee agreed on a set of principles to assist in developing future policies and strategies are placed in category III. Many of these papers present original, innovative thinking; therefore, agreement on a set of principles is considered a success. Papers in the "NC" category are those for which the Subcommittee reached little or no agreement on the paper's content, often because the Subcommittee elected not to spend additional time discussing the paper. Category "W" papers were withdrawn from discussion because they were too controversial or their development was cut short by the Presidential Directive. Category D papers were deferred, and, in some cases, their key concepts were incorporated into other issue papers.

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Table 2-1. Overview of Subcommittee Discussions Through December 1997

No.	Issue Paper	Consensus Category
	Defining Areas of Violation and Areas of Influence	
1	Identifying the Areas Responsible for Air Quality Problems	-
1a	Designation Issues for New NAAQS	II
1b	How Should Areas of Influence be Determined ?	II
1c	Update of Area of Violation (AOV)/Area of Influence (AOI) Concepts	II
2	Institutional Mechanisms for Development and Implementation of Regional Strategies	II
3	Regional Air Management Partnerships and Areas of Influence: A New Approach to Air Quality Control Regions	NC
4	Area of Violation Boundaries	II
5	Framework for Areas of Influence/Areas of Violation (AOI/AOV): Responsibility for Reaching Attainment	NC
6	Options for Designating PM-Fine Areas	III
	Planning and Implementation Issues	
7	Attainment Dates for New National Ambient Air Quality Standards (NAAQS)	IA
8	Monitoring Incentives	IA
9	Classifying Areas in Violation of the New Air Quality Standards	I
10	Progress During Air Quality Planning by States	II
11	Integrated Implementation	I
12	Regional Haze	III
13	Transportation Conformity	W

Consensus Categories:
I - Subcommittee reached consensus supporting the recommendations presented in the issue paper.
IA - Subcommittee reached consensus on some, but not all of the recommendations.
II - Subcommittee reached consensus on the range of options to be considered, but could not reach consensus on specific recommendations.
III - Subcommittee reached consensus on a set of principles, but could not reach consensus (or did not attempt to) on a limited set of options.
NC - Subcommittee could not reach consensus or agree on a limited set of options.
W - Paper withdrawn from discussion by the Subcommittee.
D - Subcommittee deferred discussion.

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Table 2-1. Overview Of Subcommittee Discussions Through December 1997 (continued)

No.	Issue Paper	Consensus Category
	Areas at Risk or Too Close to Call	
14	Treatment of Areas in Which Air Quality Trends Indicate the Risk of Violating an Ambient Standard	III
15	Implementation of a "Too Close To Call" Category for Attainmnet Demonstration	W
	Scientific and Technical Issues	
16	Air Quality Models and Emission Inventories: Their Development, Availability, Evaluation, Use and Limitations	IA
17	Utilization of an Exposure-Based Monitor System	W
	Control Strategies	
18	Control Strategies	II
19	Using Economic Incentives to Achieve Air Quality Objectives	III
20	Reasonable Further Progress	IA
21	Reviewing New Sources of Air Pollution Prior to Construction	W
22	Opportunity Matrix for Ozone, Fine Particulate Matter (PM-Fine), and Regional Haze Integration	W
23	Implementation Strategies for Contingency Measures	IA
24	Rewards and Sanctions	D
25	Measures Affecting Cars, Trucks, Buses, and Other Vehicles	W

Consensus Categories:
I - Subcommittee reached consensus supporting the recommendations presented in the issue paper.
IA - Subcommittee reached consensus on some, but not all of the recommendations.
II - Subcommittee reached consensus on the range of options to be considered, but could not reach consensus on specific recommendations.
III - Subcommittee reached consensus on a set of principles, but could not reach consensus (or did not attempt to) on a limited set of options.
NC - Subcommittee could not reach consensus or agree on a limited set of options.
W - Paper withdrawn from discussion by the Subcommittee.
D - Subcommittee deferred discussion.

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CHAPTER

3

Summaries of Issue Papers Discussed through December 1997

3 SUMMARIES OF ISSUE PAPERS DISCUSSED THROUGH DECEMBER 1997

The Subcommittee considered numerous air quality management issues brought to it in 25 issue papers from the work groups. Readers may refer to the full text versions of the issue papers, which can be downloaded from the TTN website (http://www/epa.gov/ttn), for a complete presentation of the issues, options, and recommendations. This section presents summaries of the 25 issue papers that comprise the findings of the FACA Subcommittee. Each issue paper summary has an abstract, background section, issues, options, recommendations, and highlights of the Subcommittee's discussion. This section begins with a list of the issue papers and the Subcommittee meetings where they were presented and discussed. Readers may refer to the meeting minutes, which can be downloaded from the same Internet site, for a more in-depth summary of the discussions.

Table 3-1. Discussion of Issue Papers at FACA Subcommittee Meetings

Issue Paper	Page	Dates Discussed
3.1a Designation Issues for New NAAQS	3-4	May and July 1996
3.1b How Should Areas of Influence Be Determined?	3-4	September 1996
3.1c Update on Area of Violation (AOV)/Area of Influence (AOI) Concepts	3-4	November 1996
3.2 Institutional Mechanism for Development and Implementation of Regional Strategies	3-6	September and October 1996, February 1997
3.3 Regional Air Management Partnerships (RAMPs) and Areas of Influence: A New Approach to Air Quality Control Regions	3-8	February 1997
3.4 Area of Violation Boundaries	3-10	February and August 1997
3.5 Framework for Areas of Influence/Areas of Violation: Responsibility for Reaching Attainment	3-12	October 1997
3.6 Options for Designating PM-Fine Areas	3-14	October and November 1996
3.7 Attainment Dates for New National Ambient Air Quality Standards (NAAQS)	3-15	September and November 1996, October 1997
3.8 Monitoring Incentives	3-18	July and October 1996, February, June, and August 1997

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Table 3-1. Discussion of Issue Papers at FACA Subcommittee Meetings (continued)

Issue Paper	Page	Dates Discussed
3.9 Classifying Areas in Violation of the New Air Quality Standards	3-20	February and October 1997
3.10 Progress During Air Quality Planning by States	3-23	April, June, and August 1997
3.11 Integrated Implementation	3-24	September and November 1996 August 1997
3.12 Regional Haze	3-27	September, October, and November 1996
3.13 Transportation Conformity	3-29	June 1997
3.14 Treatment of Areas in which Air Quality Trends Indicate the Risk of Violating an Ambient Standard	3-30	October 1996 and June 1997
3.15 Implementation of a ""Too Close to Call"" Designation Category for Attainment Demonstration	3-32	July 1996
3.16 Air Quality Models and Emission Inventories: Their Development, Availability, Evaluation, Use, and Limitations	3-33	August 1997
3.17 Utilization of an Exposure-Based Monitor System	3-36	July 1996
3.18 Control Strategies	3-38	April, June, and October 1997
3.19 Using Economic Incentives to Achieve Air Quality Objectives	3-41	October 1996, February, June, October, and December 1997
3.20 Reasonable Further Progress (RFP)	3-43	February, April, and October 1997
3.21 Reviewing New Sources of Air Pollution Prior to Construction	3-48	September and November 1996
3.22 Opportunity Matrix for Ozone, Fine Particulate Matter (PM-Fine), and Regional Haze Integration	3-50	April 1997
3.23 Implementation Strategies for Contingency Measures	3-52	June and October 1997
3.24 Rewards and Sanctions	3-56	February 1997
3.25 Measures Affecting Cars, Trucks, Buses, and Other Vehicles	3-58	April 1997

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3.1 Identifying the Areas Responsible for Air Quality Problems

This summary corresponds to the issue papers "Designation Issues for New NAAQS," "How Should Areas of Influence Be Determined?" and "Update on the Area of Violation/Area of Influence Concepts." Under the CAA, States and EPA designate as "nonattainment" the areas in which air quality does not meet one or more of the NAAQS. Traditionally, States following Federal guidance have required emission reductions only from the sources of air pollutant emissions in nonattainment areas. Scientists have shown that ozone and PM-2.5 (and the substances which lead to the formation of these pollutants) can travel hundreds of miles through the atmosphere. Therefore, emission reductions in a nonattainment area may be insufficient to clean the air. Sources contributing to air pollution may be far away from a downwind nonattainment area, yet States have limited means for regulating these upwind sources. The traditional process of identifying the areas responsible for air quality problems has not necessarily been maximally effective or economical in some areas. The Subcommittee discussed a new process for identifying the areas that are responsible for air quality problems and for taking actions to improve air quality. The Subcommittee further developed the proposal in several additional issue papers as described in summaries 3.2 through 3.5.

The Traditional Process of Identifying the Areas Responsible for Air Quality Problems

Under the CAA, States and EPA designate as "nonattainment" the areas in which air quality does not meet one or more of the national air quality standards. Traditionally, States following Federal guidance have required emission reductions only from the sources of air pollutant emissions in nonattainment areas. Limited mechanisms exist for addressing sources of pollution outside nonattainment areas. For ground-level ozone (smog) and the microscopic particles referred to as fine particles (i.e., PM-2.5), the traditional designation process has resulted in requirements for emission reductions in small areas—too small according to recent scientific research. Scientists have shown that ozone and fine particles (and the substances which lead to the formation of these pollutants) can travel hundreds of miles through the atmosphere. Therefore, emission reductions in a nonattainment area may be insufficient to clean the air. Sources contributing to air pollution may be far away from a downwind nonattainment area, yet States have limited means for regulating these upwind sources. The traditional process of identifying the areas responsible for air quality problems and for solutions has not necessarily been maximally effective or economical in some areas. The traditional process has been effective in identifying areas responsible for air pollution in areas where transport is not a predominant factor. The traditional process of identifying nonattainment areas has also been effective in notifying the public of areas where there may be a threat to public health.

The Foundation of a New Designation Process

To facilitate a change in the designation process, the Subcommittee defined new terms to distinguish between an area in which a violation of a standard has been observed at ambient air quality monitors, and an area containing sources of emissions which contribute to a violation of a standard.

- *Area of Violation (AOV)* The AOV is the area where the air quality standard violation is measured. An AOV is not *necessarily* responsible for the observed violation.

- *Area of Influence (AOI)* An AOI is a geographical area containing manmade

and natural sources that contribute to an AOV. The AOI may span multiple States and Tribal lands. States and Tribes in the AOI will work together to develop control strategy recommendations. The recommendations will serve as the basis upon which EPA can require States and Tribes to develop air pollution control plans.

- *Area of Concern (AOC)* Class I areas - generally national parks and wilderness areas - will be treated as "Areas of Concern" for regional haze planning purposes.

The distinction between an AOV or AOC and the AOI encourages a shift in thinking about control strategies which is beneficial for dealing with regional air pollution problems. An area of influence connotes a larger area than the area in which a violation of a standard has been observed, and helps ensure assignment of emission reduction responsibilities to all sources whose emissions contribute to a violation of a standard or regional haze.

Issues to Consider When Developing a New Designation Process

Issue	Issue Paper Recommendations
1. Should the approach to designation be changed to include areas which contribute to violations as well as areas that experience them?	Separate the nonattainment designation into two parts: first, designation of the area of violation, and second, designation of the area of influence.
2. How should areas of violation be defined and identified?	AOV boundaries should be defined solely by the geography of the ambient monitors where violations have been measured, with the boundaries then refined by analytical methods including modeling, review of source data, review of emissions inventories, and statistical tools. It should be noted that the original authors of the AOI/AOV construct expected that the AOV would probably be at least as large as the county containing the monitor that detected the violation.
3. How should AOIs be defined and identified?	
Subissue-A: Should AOIs be identified based on all emissions including concentrations of nonanthropogenic emissions, or should the designation be limited to a consideration of only anthropogenic emissions?	Subissue-A: Include all emissions, nonanthropogenic as well as anthropogenic, in the identification of the AOI.
Subissue-B: What geographic subdivision should be used to identify the AOI?	Subissue-B: Identify the AOI by county and Metropolitan Statistical Area. An exception might apply to very large counties.
Subissue-C: Should zones of influence be made an integral part of the AOI designation process? For example, an AOI might be designated that identified counties or Metropolitan Statistical Areas with certain levels or types of emissions in one zone, and those with larger levels or different types of emissions in a different or second zone.	Subissue-C: Develop AOIs without zones of influence as part of the designation.

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Further Development of the Proposed Designation Process

The issue paper which is summarized here laid the foundation for a proposal for a new designation process. The Subcommittee further developed the concepts for a new designation process in an issue paper on the mechanics of defining areas of influence and determining their size ("How Should Areas of Influence be Determined?"). Another issue paper ("Update on the Area of Violation/Area of Influence Concepts") reiterates these concepts and incorporates the Subcommittee's discussion which took place during the summer and fall of 1996, subsequent to preparation of "Designation Issues for New NAAQS" and "How Should Areas of Influence be Determined?"

Highlights of the Subcommittee's Discussion

The Subcommittee discussed these designation-related issues at the May, July, September, and November 1996 Subcommittee meetings.

The AOI/AOV construct was designed primarily to recognize the transport of pollutants and the inability of some nonattainment areas to succeed in attaining the standard when limited to controlling sources within their political jurisdiction. Members of the Subcommittee did not want to lose sight of the successes that have occurred with the traditional approach and recognized that some areas would still benefit from the traditional approach. The Subcommittee raised concerns about the length of time needed to identify AOIs, the need for complicated analyses of sources' contributions to air quality problems in downwind areas, the availability of tools and data to define AOVs and AOIs, and the uncertainty that business could face when moving to a new location before the new source review program has been established for AOIs.

3.2 Institutional Mechanisms for Development and Implementation of Regional Strategies

Because air pollution can travel long distances away from its sources, the Subcommittee identified the need for EPA to develop a process that allows States and Tribes to work together to solve regional air quality problems. This paper discusses the development of institutional mechanisms to help States and Tribes reach consensus on strategies to address regional air pollution problems. The Subcommittee generally agreed that coordination among States and Tribes is needed to address regional air quality problems. However, some members were concerned that regional planning organizations could evolve into regulatory bodies, rather than coordination and technical support entities. Others were concerned that a multi-jurisdictional planning process could delay control strategy implementation unless the process is kept simple.

The Traditional Approach to Managing Air Quality

The air quality management process has traditionally been carried out by individual States and Tribes; they are responsible for meeting and maintaining healthy levels of air quality within their borders. To meet this goal, States and Tribes are required to monitor air pollution levels, determine the cause of any problems, and develop control plans to address the problems. Difficulties with this State-by-State approach to air quality management include:

- *Air Pollutants are not Confined by Political (i.e., State and County) Boundaries.* Pollutants such as ozone and PM-2.5 can form in the atmosphere and be transported long distances. Sources of air pollution located in one State or Tribe may contribute to violations of air quality standards in neighboring or distant States and Tribes.

- *Exchange of Air Quality Information Among Different States and Tribes may be Limited.* To effectively address air pollution problems spanning multiple States and Tribes, they must work together to determine the cause of the problems and to develop control plans. These States and Tribes need to share information about monitored pollution levels and sources of emissions contributing to problems.

In many areas where regional transport is significant, the current nonattainment area approach does not provide an adequate institutional mechanism to deal with the regional nature of the pollutants of concern. New institutional mechanisms may be needed to ensure development and implementation of strategies to reduce regional transport of air pollution. To develop an effective and equitable regional strategy, it will likely be necessary for a number of States, Tribes, local governments, existing regional institutions, and EPA to work in concert to assure consistency, efficiency, and broad public participation in the process.

Regional approaches to solve air quality problems are not new. The CAA required the formation of both the OTC and the GCVTC to address ozone nonattainment in the northeastern States and adverse impacts on visibility in the Grand Canyon (Colorado Plateau), respectively. In addition, numerous institutions, including OTAG, have organized voluntarily to address regional air quality issues. These institutions engage in a range of activities, including technical analysis, training, technology transfer, research initiatives, and public outreach, and often operate as a clearinghouse. The role these institutions have in the development of air quality control strategies varies. The OTAG was formed as an ad hoc group from the Environmental Council of States (ECOS) to allow the eastern States to have a forum and opportunity to thoroughly discuss ozone transport. OTAG has assessed the phenomenon of ozone and precursor transport and has determined air quality control strategies to reduce transported ozone.

A New Approach To Managing Regional Air Quality

The issue paper explores the legal basis, membership, authority, and roles of multi-state institutions to address regional air pollution problems. The recommendations regarding structure, operations and functions of regional institutions are intended to provide the institution's participants with the flexibility to tailor their programs to the nature and scope of the region's air quality management. The recommendations recognize that States and Tribes would continue to address local air pollution problems, and develop and implement control plans, while RAMPs would be formed to focus on consistent regional approaches. A RAMP is composed of neighboring States and Tribes that have common air quality characteristics and share common air quality concerns. The RAMP would have the responsibility for coordinating the air quality analysis needed to identify the AOI for planning.

Approach for Establishing RAMPs

Establishment of RAMPs	The CAA gives EPA the authority to set up organizations to address air pollution problems spanning multiple States or Tribes. EPA could establish RAMPs using this authority. RAMPs could be established based on existing regional organizations, or entirely new RAMPs could be created. The number of potential RAMPs discussed by the Subcommittee ranged from two to six.
Structure and Operations of RAMPs	RAMPs should include representation from all levels of government with air quality regulatory authority and other stakeholder groups. RAMPs should strive to reach consensus.
Authority of RAMPs	The RAMP would act as a forum for reaching agreement and developing recommendations on how to solve regional air pollution problems. States and Tribes would retain their authority to address local air pollution problems, and to develop and implement control plans.

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Role of RAMPs in Air Quality Management

The RAMPs should identify the AOIs. RAMPs may also assist in the sharing of air quality information (e.g., monitoring data or information about sources of emissions contributing to a standard violation) among participating States and Tribes.

All State representatives would be voting members. States and Tribes would negotiate Tribal representation. Federal cabinet-level resource managers may also have a vote. Other stakeholders (e.g., industry, public interest organizations, etc.) would participate in building consensus.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the "Institutional Mechanisms For Development and Implementation of Regional Strategies" issue paper at the September and October 1996 and the February 1997 Subcommittee meetings. The Subcommittee discussed the authority and roles of the RAMPs. The Subcommittee agreed that the sovereignty of States and Tribes must not be violated. The Subcommittee raised concerns that the process may get too big and complex to function effectively and efficiently, that adequate funding and personnel would be required to conduct the analyses, and that there is a need for international cooperation as well. Members of the Subcommittee recommended that mechanisms be put in place that force participation by reluctant players, that individual States remain responsible for implementing overall air quality management plans, and that States that claim they cannot attain the standards solely because of transport must come to EPA and demonstrate this claim.

3.3 Regional Air Management Partnerships and Areas of Influence: A New Approach to Air Quality Control Regions

The Subcommittee refined the AOI, AOV, and RAMP concepts described in the previous two summaries by looking more closely at how AOIs could be identified, and how solutions to regional and local air quality problems could be developed within the deadlines established by the CAA. The Subcommittee discussed a 5-step air quality planning process which would enable, within the deadlines established by the CAA, multiple States and Tribes to coordinate their efforts in determining the causes of, and creating solutions to, regional air quality problems, while ensuring that they remain responsible for addressing local problems. Key elements of the 5-step planning process include establishing RAMPs, identifying AOIs, and developing control plans. Although a number of Subcommittee members supported the proposed approach, other members were concerned about the separation of control requirements from monitored violations and the potential delays in implementing emission reduction measures.

Overview of the Development of AOI, AOV, and RAMP Concepts

As described in the previous two summaries, the Subcommittee discussed innovative approaches to addressing regional air quality problems such as ozone, PM-2.5, and regional haze. The Subcommittee proposed to distinguish between areas measuring a violation of an air quality standard at its monitors (AOV) and areas in which the sources of emissions contributing to the violation are located (AOI). The Subcommittee also proposed the formation of RAMPs to facilitate regional planning and solutions.

While many Subcommittee members endorsed the philosophy behind AOIs, AOVs, and RAMPs or agreed with some elements of these concepts, they had concerns about the proposed approaches. Members were concerned about the length of time and amount of technical analyses needed to identify AOIs, a process that is potentially too unwieldy and complex to function effectively, and delays in the implementation of emission reduction measures.

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To address these concerns, the Subcommittee refined the AOI, AOV, and RAMP concepts by looking more closely at how AOIs could be identified and how solutions to regional and local air quality problems could be developed within the deadlines established by the CAA. The Subcommittee discussed a 5-step air quality planning process, summarized below, which would facilitate coordination by multiple States and Tribes in determining the causes of, and creating solutions to, regional air quality problems, while ensuring that they remain responsible for addressing local problems.

Five Steps for Establishing RAMPs, Identifiying AOIs, and Developing Plans

Step 1:	***RAMP Formation***	EPA would consider technical and political factors such as air quality and existing institutional structures when forming the RAMPs. Every State, except Alaska and Hawaii, would initially be placed in a RAMP. No State would be required to be in more than one RAMP. States may participate in more than one RAMP.
Step 2:	***Initial RAMP Activities***	The RAMP should identify multi-State AOIs and assist the States and Tribes in developing a Regionally Integrated Plan (RIP). The RIP is a set of recommendations from members of a RAMP to the States, Tribes, and EPA. It is intended as the basis upon which States and Tribes will develop air pollution control plans.
Step 3:	***Identify Preliminary AOIs***	Upon the designation of an AOV, the RAMP would identify the States and Tribes in the preliminary AOI, which would be responsible for the preparation of the RIP.
Step 4:	***Identify Final AOIs***	The RAMP would identify the control region which, when approved by EPA, would constitute the final AOI. EPA would require States and Tribes in the AOI to develop air pollution control plans.
Step 5:	***Prepare Control Plans***	States and Tribes prepare control plans to bring AOVs into attainment of the standards by dates established in the regulations conforming to provisions of the CAA.

Highlights of the Subcommittee's Discussion

In February 1997**,** the Subcommittee discussed the AOI/AOV/RAMP proposal. Many Subcommittee members supported the RAMP/AOI proposal because it would create forums for discussing a regional approach to a shared air quality problem, and make it easier "to avoid a situation where a group of States would be left pointing fingers at each other"; and because other multi-jurisdictional organizations such as the GCVTC and the OTAG have shown the structure is needed and workable. Some members expressed concern that development of a regional air quality plan would delay emission reductions, the draft timetable is too drawn out, and the construct might allow States to avoid the (then) current prescriptive list of controls for ozone nonattainment areas. [Many members assumed that the specific controls for ozone under subpart 2 of the CAA would no longer apply in whole or in part to areas still violating the one hour standard.] Finally, some members expressed concern about the need for a Federal backstop to prevent States from avoiding their responsibilities, the costs of participation in the process, the potential for impinging on State or Tribal sovereignty, the tight schedule for identification of preliminary AOIs, the lack of details for the regional air quality plan; the relationship and coordination among

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RAMPs and EPA's regional offices, and whether the currently available sciences can address the AOI issue very effectively.

3.4 Area Of Violation Boundaries

Building on the AOV concept described in the previous summaries, the Subcommittee discussed how boundaries would be established around the area measuring a violation of an air quality standard. The "AOV Boundaries" issue paper indicates that, because a violation of the standard initiates the planning process, the boundaries around the violation should be established as quickly as possible. The paper suggests that political boundaries such as county or metropolitan borders are a quick and easy way to set the AOV boundaries. In addition, EPA should provide guidance on the criteria for determining AOV boundaries. Finally, AOV boundaries should not be used to delineate the area where emission reduction measures would be applied (the control region). The Subcommittee did not reach consensus on the issue because of concerns about the separation of control requirements from monitored violations of the air quality standards and the level of analysis required to determine the boundaries.

Establishing Boundaries Around Areas Violating An Air Quality Standard

The majority of the boundaries of areas measuring a violation of an air quality standard ("nonattainment areas") have traditionally been political boundaries such as county or metropolitan area borders. In other words, the size and shape of the nonattainment area has been set by the size and shape of the county, metropolitan area, or other political entity containing the measured air quality violation. The nonattainment area boundaries have served several purposes:

- To help the public understand the air quality conditions in their local area,
- To indicate the extent of a particular air quality problem across the United States and identify trends as air quality improves, and
- To delineate the area where the administrative and emission reduction requirements necessary to improve the air quality are applied.

Although the traditional nonattainment area approach has helped the public understand where air pollution poses risks to human health and the environment, it has not always resulted in effective solutions to air quality problems. It has been effective in areas that are not affected by significant amounts of transported air pollution from sources outside the nonattainment area. However, ozone, PM-2.5, and regional haze can travel hundreds of miles through the atmosphere. Therefore, emission reductions in the nonattainment area alone may not be sufficient to address these air quality problems.

As described in the previous summaries, the Subcommittee discussed a new approach to address these difficulties with the traditional nonattainment area approach. The Subcommittee proposed to distinguish between areas measuring a violation of an air quality standard at its monitors (AOV) and areas in which the sources of emissions contributing to the violation are located (AOI). The "Institutional Mechanism for Development and Implementation of Regional Strategies" and "Regional Air Management Partnerships and Areas of Influence: A New Approach to Air Quality Control Regions" summaries describe the process of identifying AOIs. This summary focuses on establishing boundaries around AOVs.

What is the purpose of AOV boundaries?	AOV boundaries should be determined to identify areas where an air quality standard is violated. Consequently, the AOV boundaries could be used to help inform the public of potential health hazards associated with measured violations of the air quality standards. AOV boundaries could have a variety of other purposes including the following: to gauge progress toward attaining an air quality standard by measuring changes in the spatial extent of the violation; to initiate the regulatory planning process; and to count and track where violations occur, which will generate air quality information and indicate trends over time. Because control measures applied within an AOV would address local emissions but would not address any transported pollutants that contribute to the air quality standard violation, control measures and regulatory programs should be adopted and implemented in the AOI.
How should AOV boundaries be determined?	AOVs initiate the planning process. The planning process should begin as soon as possible. Therefore, AOV boundaries should be determined quickly, and a lot of resources and time should not be spent drawing highly specific boundaries. The smallest political boundaries (e.g., city, county, or metropolitan borders) and a minimal amount of analysis are sufficient for AOV boundaries. States and Tribes may be able to adjust AOV boundaries in the future as improved scientific evidence becomes available. The EPA should provide guidance on the criteria for determining AOV boundaries.
Should AOV boundaries be defined for individual or multiple pollutants?	Regardless of whether or not several AOVs are merged, it is important to conduct analyses of several pollutants at once to ensure that control measures for one pollutant do not worsen other air pollution problems. In addition, areas with multiple-pollutant health risks should be identified. Options discussed include: 1) establish separate AOVs for each pollutant; 2) merge all AOVs with overlapping boundaries into a single AOV; and 3) establish a third multiple-pollutant AOV where the single-pollutant AOVs intersect. Consensus was not reached on this issue.
How should regional haze AOCs be determined?	The boundaries of Class I areas are already defined. New boundaries should not be established around Class I areas.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the purpose for the AOV boundary and the method for drawing the AOV boundary at both the February and August 1997 Subcommittee meetings. It was generally agreed that the AOV boundary should indicate the spatial extent of the area with potential health hazards. The Subcommittee asked how the EPA proposal for spatial averaging of PM-2.5 monitoring data would relate to AOV boundaries. The recommendation of the work groups was to establish the AOV boundary quickly using political jurisdictions. Some members of the Subcommittee objected, stating that scientific methods should be used to draw the boundaries indicating the area where the air quality violated the standards. Other members of the Subcommittee objected to the decoupling of the measured air quality violation from the control responsibility. Designating metropolitan statistical areas as nonattainment has been an effective way to establish control responsibility in the past. The Subcommittee recommended that an

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ad hoc group be formed to address the issue of control responsibility. The ad hoc group developed a framework that is described in summary 3.5.

3.5 Framework For Areas Of Influence/ Areas Of Violation (AOI/AOV): Responsibility For Reaching Attainment

The Subcommittee extensively discussed separating the identification of the area where an air quality standard violation is measured (AOV) from the area where sources contributing to the violation are located (AOI). The initial proposal to eliminate specific control and administrative requirements for AOVs, as presented in the previous summaries, raised concerns that adoption of reasonable control measures might be inappropriately delayed. A small group of Subcommittee members met to move forward on resolving the issue of separating requirements from violations. The group developed a framework to ensure timely implementation of reasonable control measures in AOVs while providing the flexibility to be exempted from control measures that do not make sense. The full Subcommittee discussed the paper, but options and recommendations were not defined as in most other issue papers. Final agreement on this concept was not reached by the full Subcommittee because of concerns about the list of control measures and the specific emission reduction requirement.

New Approach to Air Quality Control Regions

The Subcommittee developed the AOI/ AOV construct to address some of the issues arising under the existing nonattainment area approach. These issues include:

- While the CAA specifically requires the nonattainment area to include both the area in violation and any nearby area which contributes to the violation, expediency and practicality have created inconsistencies in the application of this requirement.

- The present nonattainment classification does not differentiate between areas measuring violations of the standards and areas contributing to violations of the standards.

- Specific controls are required within the nonattainment area, but limiting controls to the nonattainment area may not fully address the violation and encourages emissions and economic growth just outside the nonattainment area border. This approach does not address the transport of pollution into a nonattainment area.

- The current requirement for adoption of specified control measures for areas designated nonattainment has resulted in significant emission reductions and improved air quality. However, in some areas, some specified measures do not provide these benefits or are regarded by some as unreasonable in the circumstances of a particular area.

The Subcommittee discussed separating the identification of the area where an air quality standard violation is measured (AOV) from the area where sources contributing to the violation are located (AOI). The February 13, 1997, "Regional Air Management Partnerships and Areas of Influence" paper indicated that the AOV should not be responsible for assuming the entire burden of emissions reductions to mitigate the observed violation. Once the AOI has been determined through an appropriate analysis, the AOI would be responsible for the emissions reductions necessary to bring the AOV into attainment. The Subcommittee recognized that the AOV would be responsible for emission reductions in cases where the AOI and AOV coincide (e.g., PM-2.5 violations caused by emissions from woodstoves and

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fireplaces in a valley). The Subcommittee also recognizes some AOVs may have no control responsibility (e.g., the tops of mountains in rural areas).

Although Subcommittee members generally agreed that separating the identification of the AOV from the more expansive AOI conceptually makes sense, the proposals to eliminate specific control and administrative requirements for AOVs raised concerns that adoption of reasonable control measures might be inappropriately delayed. A small group of Subcommittee members met to move forward on resolving the issue of decoupling requirements from violations and to address the different timeframes of the nonattainment area and AOI/AOV approaches. They proposed to find middle ground between the 1990 CAA Amendments, which required adoption of specific control measures in advance of SIP completion, and the earliest versions of the AOI/AOV construct which proposed to separate the control obligation from the AOV, with the potential for delay in adopting control measures. The group developed a framework, summarized below, that included concepts initially debated by the BPAPWG in the context of the "Classifying Areas in Violation of the New Air Quality Standards" issue paper.

Conceptual Framework to Ensure Timely Adoption of Reasonable Control Measures

- EPA, in consultation with interested stakeholders, would prepare a comprehensive list of control measures that are recognized as generally effective in achieving emission reductions in areas experiencing violations of the standards.

- Each AOV would be required to adopt NSR and a selection of control measures from the list of control measures. The AOV would not be required to select any particular measure but would be required to select enough measures to achieve a specified minimum percentage of the total emission reductions that the comprehensive list could achieve. The comprehensive list should be large enough in relation to the specified minimum percentage requirement to provide States/Tribes with real choices in meeting the percentage requirement while achieving the objective of securing significant emission reductions during the SIP development process.

- The AOV would be required to implement control measures which achieve the specified percentage unless it shows that it is not possible to achieve the percentage with measures that "make sense" given the AOV's particular problem or condition. This showing would be based on the application of a set of common sense, objective, and relatively simple criteria. For instance, current source control measures for existing sources would not make sense in an AOV that contains no emission sources. The exemption criteria should be designed so that the process does not depend on an elaborate, drawn-out analysis.

- Areas should have the flexibility to terminate a measure in the future if it is no longer needed.

Highlights of the Subcommittee's Discussion

The framework was presented to the Subcommittee in October 1997 which was at the end of the Subcommittee's deliberations. Many Subcommittee members recognized the need for an early commitment to reduce emissions in the AOV in order to gain additional flexibility in longer-term administrative and emission reduction efforts in the AOI. Some members emphasized that the early commitments in areas newly identified as violating an air quality standard should not be predicated on substantial technical analysis. This is consistent with the RACT-type requirements and the regional strategy for reducing emissions of pollutants that contribute to ozone formation. While members of the Subcommittee did not object

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to the development of a comprehensive list and the flexibility to select measures from the list, without a discussion of the specific emission reduction requirement, some members of the Subcommittee were unable to fully endorse the framework.

3.6 Options For Designating Pm-fine Areas

EPA recently issued national air quality standards to protect the public from PM-2.5. To help determine which areas meet or do not meet the new standards and what the major sources of PM-2.5 pollution are in various regions, EPA will work with the States to establish a monitoring network to measure concentrations of PM-2.5 in ambient air across the country. The Subcommittee developed a set of principles to speed the implementation of PM-2.5 monitors and ensure the collection of sufficient air quality data for designating areas that do not meet the standards and developing control programs. The Subcommittee emphasized the need for chemical analyses of PM-2.5 data to fingerprint the detected substances, which would help identify sources contributing to PM-2.5 problems. The Subcommittee discussed these issues before promulgation of the PM-2.5 standards and before the President issued the Directive on implementation of the standards.

New Standards for Particulate Matter

PM is the mixture of liquid and solid particles in the air. Previous PM standards regulated coarse particles (smaller than 10 micrometers, or one-seventh the width of a human hair, in diameter). A new standard issued recently by the EPA seeks to protect the public from even finer airborne particles: less than 2.5 micrometers in diameter. These fine particles, or PM-2.5, are so small that several thousand of them could fit on the period at the end of this sentence. Recent studies found that these fine particles are more likely than coarse particles to contribute to premature death, increased hospital admissions, and other health effects associated with exposure to particulate matter.

The Traditional Approach to Determining Violations

The CAA requires the EPA to designate areas that do not meet new national ambient air quality standards within 3 years of the date the standards are promulgated. Three years of air quality data are considered necessary for determining whether an area meets (attains) or violates a standard — by providing a stable target and minimizing the possibility of areas slipping in and out of attainment from year to year.

If, based on 3 years of monitored air quality data, an area is identified as being in violation of a standard, the area is designated "nonattainment" and must develop a plan and implement controls to attain the air quality standard. The data from monitors are necessary for planning and developing control strategies because they help air quality managers understand the nature and cause of pollution problems.

EPA estimated that a network of 1,500 monitors across the United States is needed to support the identification of PM-2.5 problem areas and the development of plans and control strategies. A network this extensive will be expensive and time-consuming to design, build, and deploy. At the time the Subcommittee discussed designation issues, it was understood that even though areas not in compliance with the new PM-2.5 standards must be identified by July 2000 (3 years from promulgation of the standards), a comprehensive monitoring network would likely not be in place until December of that year, and 3 years of data from the entire network likely would not be available until 2003.

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Highlights of the Subcommittee's Discussion

The Subcommittee discussed the options for designating PM-fine areas at both the October and November 1996 Subcommittee meetings. In light of these difficulties, the Subcommittee composed a set of principles to guide the development of PM-2.5 monitoring programs. The principles aim to speed the implementation of PM-2.5 monitors as much as possible and to ensure that sufficient data are collected for the development of plans and control strategies.

The Subcommittee advised that the EPA should:

- Identify all resources (money and personnel) required.
- Recognize the need for adequate financial and management support of monitors.
- Require chemical analysis of PM-2.5 data to develop more effective plans and control strategies.
- Complete the process of identifying PM-2.5 violations within 3 years.
- Identify PM-2.5 violations with a sufficient amount of air quality monitoring data.
- Recognize that air quality data collection drives the process of identifying violations of air quality standards and that the process of identifying violations drives data collection.
- Consider more frequent monitoring.
- Encourage States to begin their planning processes as soon as possible.
- Identify areas violating the PM-2.5 standards with sufficient data as soon as possible.
- Encourage areas to plan and implement controls as early as possible.

Statement from the Presidential Directive

Three calendar years of Federal reference method monitoring data will be used to determine whether areas meet or do not meet the PM-2.5 standards. Three years of data will be available from the earliest monitors in the spring of 2001, and 3 years of data will be available from all monitors in 2004. Following this monitoring schedule and allowing time for data analysis, Governors and the EPA will not be able to make the first determinations as to which areas should be designated nonattainment until at least 2002, 5 years from now. The CAA, however, requires that the EPA make designation determinations (i.e., attainment, nonattainment, or unclassifiable) within 2 to 3 years of revising a NAAQS. To fulfill this requirement, in 1999 the EPA will issue "unclassifiable" designations for PM-2.5. These designations will not trigger the planning or control requirements of part D of Title I of the CAA.[1]

3.7 Attainment Dates For New National Ambient Air Quality Standards (NAAQS)

The CAA establishes deadlines, referred to as attainment dates, by which areas must reach or attain the national air quality standards. An area violating a standard must reach the standard as quickly as possible but no later than 5 years from the date it was designated as violating the standard. The attainment date may be extended up to an additional 5 years, considering the severity of the air quality problem and the feasibility of pollution control measures. Up to two additional 1-year extensions may be granted to areas meeting specific criteria. The Subcommittee generally agreed that the current process be used

[1] U.S. President, Memorandum for the Administrator of the EPA, "Implementation Plan for Revised Air Quality Standards," July 16, 1997.

to establish attainment dates for the new ozone and PM standards and that EPA should provide guidance on how areas would qualify for the two 1-year extensions. The Subcommittee did not resolve whether the 3-year period to assess attainment should occur within or subsequent to the initial 5-year period.

Establishing and Achieving Attainment Deadlines

Areas that are designated as being in violation of a national air quality standard must take actions to improve their air quality until the levels of the pollutant are below the standard. The CAA establishes deadlines, referred to as attainment dates, by which areas must reach or attain the standard. The CAA requires areas to reach the standard as "expeditiously as practicable" but no later than 5 years from the date it was designated as violating the standard. The attainment date may be extended up to an additional 5 years, considering the severity of the air quality problem and the availability and feasibility of pollution control measures. Up to two additional 1-year extensions may be granted to areas meeting specific criteria.

The Subcommittee discussed whether or not 5 years is a realistic deadline to achieve the new ozone and PM standards. Some Subcommittee members believe that a 5-year attainment date ensures that areas plan and implement control measures without delay. However, other members are concerned that 5 years does not provide areas, particularly areas with severe or complex air quality problems, with a reasonable amount of time to plan, implement, and assess their control strategies. In addition, because 3 years of air quality monitoring data are needed to demonstrate attainment with the new standards, some Subcommittee members thought some areas may need additional time beyond 5 years to reach and demonstrate attainment of the new standards.

Key Considerations for an Attainment Dates Recommendation from the Ad Hoc Group

An ad hoc group was formed to develop a consensus position on an attainment dates recommendation. The ad hoc group reached agreement on a list of items to be considered in the development of an attainment dates recommendation. Several of the key considerations are listed below.

- *Date Certain as a Driver.* Set deadlines for reaching attainment are needed to drive areas to complete their planning and implementation of control measures as quickly as possible.

- *Reasonable Planning Cycle.* The actions needed to reach the standard take time. Adequate time should be provided for planning, adopting regulations, implementing control measures, and assessing the effectiveness of strategies.

- *Flexibility.* Flexibility should be provided to areas that plan, adopt, and implement control strategies but fail to reach the standards in spite of their "good faith" efforts. Such flexibility should include opportunities for attainment date extensions.

- *Scaled/Targeted Consequences.* Consequences for areas that fail to complete some or all of their planning and/or control requirements should be scaled and targeted toward the specific activities that they are intended to address. Areas should not be punished for failing to reach a standard if all planning and implementation has been completed.

The BPAPWG developed an attainment dates recommendation that incorporated the ad hoc group's concepts. They recommended that a set attainment date be established to drive areas to complete their

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planning and implementation of emission reduction measures as quickly as possible. Areas violating an air quality standard should have reasonable planning cycles to allow adequate time for all components of the planning and implementation process. Areas should complete mid-course evaluations to determine if their control strategy plans are making sufficient progress toward attainment. Penalties should be based on failure to plan and/or implement, not on failure to attain. This recommendation was developed prior to the Presidential Directive and was not presented to the Subcommittee.

Establishing Attainment Dates Under the New Standards

The Presidential Directive indicates that the deadlines for achieving the new ozone and PM standards will be set following the current CAA process of establishing attainment dates. In response to the Directive, the BPAPWG redirected their discussion of attainment dates and recommended the approach summarized below. At the October 1997 meeting, the Subcommittee generally agreed that the current process of establishing attainment dates should be used to set attainment deadlines for the new ozone and PM standards. Some Subcommittee members object to the proposal to allow areas to collect the 3 years of air quality data subsequent to the first 5 years.

- Areas designated as being in violation of a standard should reach the standard as expeditiously as possible but no later than 5 years from the date of designation.

- When areas submit their control strategy plans to EPA, they may request an extension of up to 5 additional years to reach attainment. Considering the severity of the air quality problem and the availability and feasibility of pollution control measures, EPA could grant more distant attainment dates of up to 5 additional years. The criteria for granting more distant attainment dates must be defined.

- The 3-year air quality monitoring period (to determine whether or not an area has attained the standards) should occur subsequent to the initial 5-year attainment date, followed by 10 years of maintaining the standard.

- EPA should develop guidance on qualifying for extensions under the new standards.

- Section 179(d) of the CAA contains sufficient actions for addressing areas that fail to attain by their deadline. Under these provisions, areas that fail to attain would submit another control strategy plan, which may include additional requirements, to EPA. New attainment dates would then be set in the same manner as before.

- Some Subcommittee members are concerned about areas that cannot demonstrate attainment.

Highlights of the Subcommittee's Discussion

An initial recommendation brought to the Subcommittee in September 1996 was for recognition of a 10-year planning cycle and flexibility in the establishment of an attainment date depending upon the complexity of the air quality issue. This recommendation was rejected by the Subcommittee and the work group was asked to rework the recommendation. A set of concepts and elements for consideration or inclusion in the final attainment dates recommendation was developed and discussed by the Subcommittee in November of 1996. The Subcommittee discussed attainment dates for the final time in October 1997. Following proposal of the new standards and the Presidential Directive, the Subcommittee discussed and generally endorsed retaining the current process of establishing an attainment date and made recommendations on the requirements for attainment date extensions. The Subcommittee did not discuss whether the 3 years of air quality data

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needed to demonstrate attainment should be collected within or subsequent to the first 5 years. Under the old exceedance-based form of the standard, attainment could be determined with 1 year of air quality data. Some Subcommittee members disagree with the proposal to allow areas to collect the 3 years of air quality data subsequent to the first 5 years.

3.8 Monitoring Incentives

This summary corresponds to the "Incentives for Ambient Air Quality Monitoring Under New NAAQS" issue paper and the "Proposed Final Recommendations" of the Ad Hoc Group on Monitoring Incentives. Air quality monitoring, measuring the concentrations of pollutants in the air, is a vital step in managing air quality. Monitoring data are used to compare an area's air quality to the standards, inform the public of an area's air quality, evaluate an area's air quality improvement, and study how one area's pollutants impact the air quality of neighboring or distant areas. Augmenting the existing State and Federal air quality monitoring networks with additional monitoring stations could strengthen efforts to address ozone and PM-2.5 problems. The Subcommittee developed a set of recommendations to increase and improve monitoring efforts by providing incentives through funding and partnerships with businesses, environmental groups, and communities.

The Role of Monitoring in Improving and Maintaining Air Quality

Air quality monitoring stations are set up all over the country to measure the ambient concentrations of criteria pollutants, a group of common air pollutants regulated by EPA on the basis of their health and/or environmental effects. The CAA requires every State to establish a network of air quality monitoring stations for these pollutants, using criteria set by the EPA for their location and operation. The monitoring stations established by State and local governments make up the State and Local Air Monitoring Stations (SLAMS) network. The vast majority of the SLAMS network air pollutant measurements represent the country's heavily populated urban areas. To obtain more timely and detailed information about air quality in strategic locations across the nation, EPA established an additional network of monitors, the National Air Monitoring Stations (NAMS). One purpose of the NAMS network is to monitor the States' progress in meeting air quality standards.

Monitoring data are used for many purposes in air quality management. It is through air quality monitoring that areas with dangerous levels of air pollutants are detected. Areas with pollutant levels that are higher than allowed by the national air quality standards are called "nonattainment areas," and must take actions that will reduce the levels of these pollutants. Air quality monitoring data are also used for other important purposes, including:

- Informing the public of an area's air quality,
- Evaluating an area's air quality improvement,
- Developing and evaluating air pollutant control strategies, and
- Studying how one area's pollutants impact the air quality of neighboring or distant areas.

Why Additional Monitoring Would Strengthen Efforts to Address Ozone and PM-2.5 Problems

Augmenting the existing State and Federal air quality monitoring networks with additional monitoring stations could be beneficial for areas trying to reach and maintain the new

ozone and PM-2.5 standards. For example, few monitoring stations are located in rural areas, even though ozone levels in these areas may exceed acceptable levels. In addition, the NAMS and SLAMS networks were not designed with the primary purpose of studying how one area's pollutants impact the air quality of neighboring or distant areas. An understanding of the regional nature of ozone and PM-2.5 is important because these pollutants (and the substances which lead to their formation) can travel hundreds of miles through the air.

The new PM-2.5 standard requires a new PM-2.5 air quality monitoring network. Because this network will be expensive and time consuming to design, build, and deploy, new levels of cooperation among State and Federal agencies will be necessary.

Encouraging Additional Monitoring Efforts

The Subcommittee made the following recommendations in order to increase and improve monitoring activities:

Provide financial incentives to States.	Major pollution sources pay permit fees to release certain pollutants into the air. These fees could be applied toward monitoring efforts.
Expand national monitoring requirements.	National monitoring requirements could be expanded to include adding monitors in rural and transport areas and measuring health or environmental impacts. Appropriate funding would also be expanded.
Use public and private monitoring data.	Businesses could develop and manage their own monitoring programs as a source of air quality data in addition to data gathered by State and Federal networks. Data collected by businesses could be used to establish more accurate boundaries around nonattainment areas and to analyze the chemical makeup of PM.
Encourage public-private partnerships.	Public-private monitoring partnerships could be formed among health-based organizations, public interest groups, private foundations, industry, and Federal land managers such as the Department of Interior. Data from such partnerships should be entered into the public record.
Expedite monitoring of PM-2.5.	The new PM-2.5 monitoring network will be expensive and time consuming to design, build, and deploy. Any efforts to accelerate this monitoring process will benefit the public health and the environment.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed monitoring incentives at the July and October 1996 and also at the February, June, and August 1997 Subcommittee meetings. The Subcommittee discussed existing disincentives to air quality monitoring, the need for speciated air quality data, and the existing locations of monitors. Under the existing CAA, when a monitor registers an air quality violation, the area is required to begin the air quality management process to address that violation. This has created a disincentive to voluntarily locating air quality monitors even though it is generally agreed that additional air quality data are needed to effectively and efficiently address the Nation's air quality problems. Alternatively, air quality monitors that register violations, even in rural areas, indicate a problem that must be addressed. The Subcommittee discussed the decoupling

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of air quality violations from the nonattainment process as a means of increasing the air quality monitoring network. The Subcommittee also discussed the need for speciated data, especially for PM-2.5. In addition to providing the total mass or concentration of PM-2.5, speciated data describes the chemical components and form of the particles. These data are needed to understand the sources of the air pollution and cost effectively address the air quality problem. The Subcommittee recommended the incentives to increase monitoring, listed on the previous page, and discussed additional ideas that were endorsed by some sectors of the Subcommittee.

3.9 Classifying Areas In Violation Of The New Air Quality Standards

This summary corresponds to the "Classifications of Designated Areas Under New NAAQS" issue paper. The current classification system characterizes an area in violation of an air quality standard (referred to as a nonattainment area) according to the severity of its air pollution problem. This system establishes consistent requirements across similarly classified areas and provides the public with an easily understood indication of the severity of the area's problem. However, the system has been criticized for lacking flexibility in the controls required for a given classification and for creating a sense of complacency because an area missing an attainment deadline can always be "bumped up" to a higher classification and assigned an extended attainment deadline. The concept of classification may continue to have value if it preserves consistency and informs the public, but it can be altered to strike a balance between prescription of controls and flexibility in control requirements. The Subcommittee initially considered a variety of options to improve the current classification system, but did not reach consensus on any one option. However, following the Presidential Directive on implementing the new standards, some Subcommittee members generally agreed that additional ozone classifications beyond the Directive's "transitional" classification should not be established, and that the decision on PM-2.5 classifications should be postponed until more air quality monitoring data are available. Other Subcommittee members support classifications and do not believe classifications for the new ozone and PM-2.5 standards should be ruled out.

Issues Regarding the Current Classification System

- *Sets Dates for Attaining the Standard*: The existing process considers only the severity of the problem when assigning classifications. A classification determines the number of years after designation when an area that is not in attainment must meet the standard. It also defines specific control requirements applicable to the area.

- *May Allow Discretion:* In setting a new standard, the CAA allows the EPA Administrator flexibility in terms of making a decision on whether or not to use a classification system, and also in specifying the factors that must be used for assigning classifications.

- *May Delay Controls*: Some Subcommittee members are concerned that a regulatory agency might assume it can delay implementing control requirements until near the date for attainment associated with its classification. This is premised on the assumption that, if attainment is not reached, the area need only "bump up" to the next classification to receive a more distant attainment date.

- *Lacks Flexibility*: The prescribed control measures and planning requirements

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associated with a classification represent an inherent lack of flexibility which may not address local problems (i.e., some prescribed measures may have little air quality benefit or may be less cost effective than their alternatives).

Goals for a Classification System

The paper identifies six goals to consider in developing a classification system: 1) **consistency** of nonattainment areas in terms of planning requirements, control requirements, planning cycles, and attainment dates; 2) **education of the general public** and the regulated community as to the seriousness of an air quality problem; 3) planning and control requirements and attainment dates **tailored** to the type or severity of the air quality problem; 4) a method of **pushing an area up** to the next higher classification level if it fails to attain the standard on time; 5) a way to **draw a distinction concerning the complexity** among areas having local or transport problems, or a combination of both; and 6) a mechanism to **integrate planning** in areas having compound problems with ozone, PM-2.5, and regional haze problems.

Issues to Consider in Designing a New Classification System

Should the current approach to classification be retained?	This approach is already familiar to those involved in addressing nonattainment issues. It allows for "bump up" if an attainment date is missed, but is prescriptive in terms of attainment dates and actions required for a given classification.
Should there be a two-tiered approach to classification?	All nonattainment areas or AOVs are classified as short- or long-term depending on the complexity of their nonattainment problem. The former are deemed able to attain in 5 years or less with the application of reasonable local controls and national control measures, the latter in 5 to 10 years. Either all areas could be classified initially as short-term with a "bump-up" to long-term for those unable to attain in 5 years, or the short-term/long-term classification decision could be made up front.
Should areas be classified specifically to address regional transport?	This is a variation of the two-tiered approach which separates areas according to the complexity of their transport problem instead of the time needed for attainment.
Should areas be classified to emphasize differences between AOIs and AOVs?	The AOV is classified to reflect the severity of the air quality problem, inform the public of the problem, and educate the public on ways to protect against the consequent health impacts. However, most of the ultimate control requirements to address the problem are applied to the AOI. Two options are presented to accomplish this. In both, air quality progress or deterioration would be recognized by "bumping up" or "bumping down" the area's classification. In the first, a classification is assigned to the AOV based on the severity of its air quality problem. In the second, a classification is assigned to the AOI, which addresses that area's planning and/or control requirements. These options are not necessarily mutually exclusive.
Should areas close to nonattainment be classified?	Some areas may not violate the air quality standards, but may be close to doing so. Such areas are discussed in a separate issue paper entitled, "Treatment of Areas in Which Air Quality Trends Indicate the Risk of Violating an Ambient Standard."
Should large AOIs be subdivided in different control regions, each with its own classification?	Subdivide the AOI into different control regions with accompanying classifications. Each classification would carry with it a core of requirements that become more stringent in proportion to the severity of the impact of the control region on the AOV.

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Issues to Consider in Designing a New Classification System (continued)

Should classifications be made to identify core requirements?	Each classification would carry with it specific planning and control requirements. The classification system then becomes the means to impose the core requirements (or progressive requirements in the case of a bump-up) which are in addition to the requirements identified by the State for the specific area. Four options for doing this are identified.
Should there be no classifications?	The Administrator may choose not to classify areas at all. If the control and planning issues are not significantly different from one area to another, perhaps a classification system is not needed to address nonattainment issues.

Recommendations on Classifications

Classifications for PM-2.5

Designing a PM-2.5 classification scheme is premature until more PM-2.5 air quality monitoring data are available. In conjunction with reviewing the data, the typical reasons for classifications should be considered (i.e., severity of the air quality problem, attainment dates, planning and control requirements), along with the advantages and disadvantages of a classification system. If nonattainment areas can be grouped according to similar problems and requirements and there are compelling advantages in doing so, then a classification system could be considered as a means to achieve this grouping.

Classifications for Ozone

There should be no additional ozone classifications for the 8-hour standard beyond the transitional classification established by a Presidential Directive concerning the new standards. The Directive establishes transitional classifications for areas that: 1) are attaining the 1-hour standard or will attain the 1-hour standard by 2000, and 2) participate in a regional NO_x strategy or achieve emissions reductions on the same schedule as the regional strategy.

Classification should not be used to facilitate the establishment of attainment dates for the 8-hour ozone standard.

Classification should not be used to differentiate planning and control requirements from one area to another. States and local air quality agencies should be given the maximum flexibility to develop control strategies that make sense for their area.

The Subcommittee generally agrees that classification alone is not an effective mechanism for communicating to the public health risks associated with air pollution. However, the Subcommittee supports efforts to communicate information which helps the public to understand the relationships between air quality and public health, air quality progress, and geographical comparisons of air quality. Such programs as the Pollutant Standards Index (PSI) and Ozone Action Days are important elements of an overall communication effort.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the "Classifications of Designated Areas Under New NAAQS" issue paper in February 1997 and again in October 1997. The Subcommittee discussed classification systems that would convey information about air quality (potentially integrating the ozone and PM-2.5 air quality levels), establish the attainment date, or prescribe control measures. Although the recommendation brought to the Subcommittee was to delay further discussion of a classification system for PM-2.5 until more PM-2.5 air quality monitoring data are available and to have no additional ozone additional ozone classification categories

beyond transitional, the Subcommittee reiterated the potential benefits of a classification system.

3.10 Progress During Air Quality Planning By States

This summary corresponds to the issue paper "Progress During SIP Development." States with air quality problems must develop plans for solving them. Now that EPA has established new air quality standards, States with ground-level ozone or PM problems are beginning the process of deciding what to do. Should States take action immediately, even though additional data may need to be gathered and additional analyses conducted, to develop a comprehensive set of control programs to achieve the new standards? The Subcommittee generally recommends that States with air quality problems take early actions to improve air quality and protect the public health while efforts are underway to develop a more comprehensive solution.

The Existing State Air Quality Planning Process

A State implementation plan, or SIP, is a State's official, comprehensive plan for actions that will bring air quality up to the national standards set by EPA. Every State with ozone or PM-2.5 problems must develop a SIP to address localized pollution controls. These plans are complex and take years to develop because data need to be gathered on emissions and the levels of pollutants in the air, and the State must determine each industry's fair share of the responsibility for reducing emissions. In addition, legislation is needed for some State actions, which requires more time.

When EPA revised the standards for these pollutants in July 1997, it announced that States that do not meet the new ozone standards may take up to 6 years (to 2003) to collect data and develop SIPs. It also announced that States that rely on a new regional strategy to reduce ozone levels (by reducing emissions of NO_x) and meet the other criteria for designation as a "transitional area" must develop SIPs by 2000. States that do not meet the new PM-2.5 standards may take up to 8 or 11 years (by 2005–2008) to gather data and develop SIPs for that pollutant. The industries and other sources of emissions responsible for these air quality problems may already be regulated to some degree, but the specific emission reduction requirements that apply to areas violating the previous ozone standard (subpart 2 of title I of the CAA) do not apply to areas violating the new air quality standards.

Recommendations for Air Quality Improvement During the Planning Process

The Subcommittee recommended that EPA and State governments take actions that will accelerate achievement of better air quality.

- States with known or probable air quality problems could immediately begin the planning process (e.g., hiring additional staff, if necessary) for obtaining information on emissions and pollutant concentrations in the air.
- EPA should adopt appropriate national measures to reduce emissions contributing to ozone and PM-2.5 problems across the country.
- States with nonattainment areas or AOVs—areas that officially have been designated as violating either of the new standards—should adopt measures to reduce emissions (or show why such measures would not be beneficial) even while they are developing SIPs, in order to reduce the health and welfare impacts of air pollution as quickly as possible.
- States with areas that are almost certain to be designated as nonattainment should adopt measures

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to reduce emissions in an expeditious and prudent manner.

Highlights of the Subcommittee's Discussion

This issue paper was discussed at the April, June, and August 1997 Subcommittee meetings. The Subcommittee discussed the length of time that would elapse before measures are implemented to achieve the new standards. Some members believe that progress was occurring (and emissions are being reduced) as a result of other EPA air programs (the acid rain program, the air toxics program, etc.). Other members of the Subcommittee believed that additional action should be taken during the period of SIP development in order to reduce exposures to the pollutants. For example, the 1990 CAA Amendments required a fixed emission reduction (15 percent) for all ozone nonattainment areas during the 3-year plan development period. The Subcommittee discussed, but did not reach consensus on, whether there should be additional mandatory emission reduction requirements during the period of SIP development.

The "Progress During SIP Development" issue paper was drafted before the Presidential Directive on the implementation of the new standards was issued. Subcommittee members generally agreed that the issue paper's recommendations were directionally and philosophically consistent with the Directive. The paper and the Directive recognized and endorsed the need for State and regional planning activities for areas where air pollution problems are known to exist. In addition, areas with known air quality problems have obligations to implement measures, and areas that are likely to have air quality problems are encouraged to take early actions using incentives. Finally, areas that did not have or contribute to existing air pollution problems are not expected to implement additional controls.

3.11 Integrated Implementation

This is a summary of the "Integrated Implementation" and the "Integrated Implementation Phase II Update" issue papers. EPA recently issued new air quality standards for ozone and PM-2.5 and proposed a program to address regional haze. These three air quality problems result from common chemistry, emissions from many of the same sources, similar weather conditions, and other factors. To streamline redundant and overlapping efforts, the Subcommittee discussed ways to combine or integrate analytical, administrative, and/or emission reduction efforts. The Subcommittee generally agreed that EPA should develop guidelines to help States integrate their air quality monitoring, modeling, and emissions inventory development efforts. The Subcommittee also reached general agreement on several approaches to integrate administrative activities and control strategies to address multiple air quality problems.

Similarities of Ozone, Regional Haze, and PM-2.5

Ozone, regional haze, and a significant portion of PM-2.5 are produced in the air by the combination of pollutants ("precursor pollutants") from many of the same sources, including power plants, cars, paints, and solvents. Weather conditions such as sunlight and humidity also affect the levels of ozone, PM-2.5, and regional haze.

Optimizing Control Efforts for Multiple Air Quality Problems

In the past, air pollution control efforts and Federal guidance provided to States focused on one air quality problem at a time without formal recognition of any beneficial or adverse impacts of these programs on other air pollutants. This was because of the lack of adequate understanding of air pollutant transport and the atmospheric chemistry

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processes that generate pollutants in the air, as well as to administrative complexities. In some cases, this resulted in increased costs to States in developing and administering overlapping or redundant programs. In addition, industries often faced multiple and sometimes conflicting requirements in complying with different programs to meet the national air quality standards.

Since ozone, PM-2.5, and regional haze are often caused by the same sources, analytical, administrative, and/or emission reduction efforts could be combined for the three air quality problems to eliminate redundant and overlapping efforts. In addition to the savings in time, money, and resources, integration could accelerate improvements in air quality, leading to more immediate improvements in public health, the environment, and overall quality of life.

The Integrated Implementation issue papers emphasize that complete integration of all planning activities and control strategies may not always be feasible, but opportunities for integration should be explored and implemented whenever practical. For example, it may be possible to integrate the analysis of the formation and transport of the three air quality problems, while developing control measures to correct the problems may still require three separate approaches. Exactly which program elements to integrate and how they should be integrated will depend on many factors, such as implementation time lines, the pollutants, weather conditions, geography, and seasonal concerns. Further, the papers indicate that although savings through integration could provide many benefits, integration efforts should not lead to delays in achieving air quality standards or regional haze objectives.

The Subcommittee identified issues to consider and made recommendations for developing integrated approaches to address ozone, PM-2.5, and regional haze problems. The first Integrated Implementation paper (Phase I) focused on the data and tools needed to conduct integrated analyses of multiple air quality problems, and the second Integrated Implementation paper (Phase II) examined administrative and control strategy aspects of integration.

Phase I: Data and Tools Needed to Integrate Analyses of Multiple Air Quality Problems

To develop a solid scientific basis for the integration of PM-2.5, ozone, and regional haze control strategies, several new/improved analytical tools are needed.

- **Expanded air quality monitoring networks** for PM-2.5, ozone, and regional haze are needed to understand the chemical and physical processes which lead to the formation of one or more of these air quality problems. Because ozone, PM-2.5, regional haze, and their precursor pollutants can travel hundreds of miles in the atmosphere, monitoring networks should be expanded to study the transport of these pollutants, while continuing to focus on urban areas. Multiple States may need to be involved to achieve monitoring objectives for regional transport. In addition, PM-2.5 air quality monitoring data should be chemically analyzed to help identify which emission sources are contributing to the formation of PM-2.5. This is a vital step in control strategy development.

- **Accurate emissions inventories** (compilation of information on sources which emit the pollutant of interest or its precursors) are needed for all sources contributing to ozone, PM-2.5 and regional haze. Consistent methods should be used to develop the emissions inventories in order to coordinate analyses and share information among multiple jurisdictions.

- Expanded capability to conduct **integrated air quality modeling** of

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ozone, PM-2.5, and regional haze is needed to understand the complex chemical and physical processes which lead to their formation and to predict the impacts of controlling precursor pollutants on the ambient pollutant concentrations.

- Knowledge of the **regional and seasonal variations** in the air pollutant emission sources, weather conditions, and atmospheric chemistry interactions of the three air quality problems is necessary.

The Subcommittee generally agreed that EPA should develop guidelines to help States integrate their air quality monitoring, modeling, and emissions inventory development efforts to address more than one of the three air pollution problems simultaneously. Some members believed that the guidelines should be uniform nationwide and supplemented with additional information as needed to address the conditions of a particular region. Other members believed the guidelines should be tailored to each region's needs and should contain minimum guidelines to ensure that consistent methods are used.

Phase II: Integrating Administrative Activities and Control Strategies

The issue paper includes the recommendations summarized below. The Subcommittee reached general agreement on several of the proposed approaches to integrate administrative activities and control strategies to address multiple air quality problems.

1. Ozone, PM-2.5, and regional haze monitoring, along with the related compliance and control strategies, should be streamlined through integration rather than independent assessment.

2. EPA should not force the integration of implementation schedules and deadlines.

3. EPA should develop additional mechanisms for improving regional haze conditions in areas where local programs designed to address ozone or PM-2.5 have little impact on regional haze. One approach is to offer incentives to encourage States to work together to address regional haze problems.

4. EPA should promote periodic evaluations by States of opportunities to integrate their air quality programs.

5. EPA should promote adoption of long-term measures that control more than one pollutant, while ensuring compliance with progress and attainment deadlines.

6. EPA and the States should emphasize measures that control several pollutants in developing strategies that address the ozone and PM-2.5 air quality standards and regional haze.

7. EPA and States should consider broadened criteria for the selection and implementation of controls based on multiple pollutant and transport effects on public health and visibility. EPA should also directly address the issue of the multimedia impacts of control strategies (e.g., on soil, water, etc.).

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the integration of ozone, PM-2.5, and regional haze implementation schedules and deadlines at the September and November 1996 Subcommittee meetings and again at the August 1997 Subcommittee meeting. Three years of air quality monitoring data are needed to designate areas as being in violation of the PM-2.5 standard, but, at the time the Subcommittee discussed this issue, it was understood that the first full year of data from PM-2.5 Federal Reference Method (FRM) monitors would not be available until the end of 1999. This meant that ozone and PM-2.5 nonattainment area designations were not likely to occur at the same time.

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Because control strategy plans and other milestones are triggered by nonattainment area designations, out-of-synch ozone and PM-2.5 designations would require a delay in ozone programs to integrate the time lines. In addition, plans to address regional haze must be revised by February 1999, which is significantly earlier than the dates for completing ozone and PM-2.5 control strategy plans. Many members believed that planning activities and emission reduction measures for one pollutant should not be postponed just for the sake of coordinating them with efforts to address another pollutant. In general, the Subcommittee supported efforts to integrate ozone, PM-2.5, and regional haze implementation programs where feasible, but acknowledged the technical and administrative complexities of integrated approaches.

3.12 Regional Haze

Visibility impairment occurs as a result of the scattering and absorption of light by particles and gases in the atmosphere. It is most simply described as the uniform haze which obscures the clarity, color, texture, and form of what we see. Regional haze, as the name implies, is an air pollution problem which can span large areas, sometimes extending across multiple States. In 1994, EPA began developing a Regional Haze program intended to ensure continued progress toward the national visibility goal established by the CAA. The "Regional Haze" issue paper identifies issues and makes recommendations to be considered in the development of EPA's regional haze regulations. The recommendations describe how the regional haze program should be implemented through State and Tribal air pollutant control plans. The Subcommittee did not reach consensus on the entire set of recommendations.

Background on Regional Haze

Visibility impairment occurs as a result of the scattering and absorption of light by particles and gases in the atmosphere. It is most simply described as the uniform, whitish gray haze which obscures the clarity, color, texture, and form of what we see in the landscape. Haze is caused by emissions of pollutants from numerous sources, such as power plants, industrial and manufacturing processes, agriculture and forest fires, and automobiles. Emissions from these sources generally span broad geographic areas and can be transported significant distances, sometimes hundreds of miles. Consequently, haze occurs in large areas throughout the United States.

Visibility conditions vary across the country. With a few exceptions, much of the eastern United States has poorer visibility than the western United States because of higher levels of particles from manmade and natural sources and the effect of higher humidity levels on those particles. Some particles, such as sulfates and nitrates, grow in size as humidity in the air increases, which increases the amount of haze and reduces visibility. Visibility in the eastern United States should naturally be about 90 miles, but air pollutants have reduced this range to 14 to 24 miles. In the western United States, visual range should be approximately 140 miles, while current conditions limit it to 33 to 90 miles. Visibility also varies seasonally and is generally worse during the summer months when humidity is higher and the air is stagnant.

Sources of regional haze vary from region to region. In the eastern United States, for example, sulfates formed from power plant and other large industrial sources of emissions play a major role. In the western United States, nitrates, sulfates, organic matter, soot, and dust emitted by power plants, motor vehicles, petroleum and chemical industrial facilities, wildfires, and forest-management burning all contribute to reduced visibility.

The CAA established a national goal to improve and preserve visibility in more than 150 national parks and wilderness areas,

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including the Grand Canyon, Yosemite, Mount Rainier, the Great Smoky Mountains, Acadia, and the Everglades. The current visibility regulations, issued in 1980, require States and Tribes to develop strategies for reducing localized visibility impairment that can be attributed to individual sources or small groups of sources (smoke plumes). The CAAA of 1990 created the GCVTC to recommend to EPA strategies for protecting visual air quality at national parks and wilderness areas on the Colorado Plateau. The 1990 CAAA also required EPA, within 18 months of receiving GCVTC's recommendations, to develop a comprehensive regional haze program intended to ensure that continued reasonable progress is made toward the national visibility goal of "no manmade impairment." Such control efforts would likely result in improved public health protection and visibility in areas outside national parks and wilderness areas as well.

The paper identifies issues and makes recommendations to be considered in the development of EPA's regional haze regulations. The recommendations describe how the regional haze program should be implemented through State and Tribal air pollutant control plans. The Subcommittee did not reach consensus on the entire set of recommendations.

Regional Haze Issues and the Paper's Recommendations

Developing Targets to Assure Continued Reasonable Progress Toward the National Visibility Goal

The paper recommends that the targets that would constitute continued reasonable progress be developed through a stakeholder process. This process should include broad representation of States, Tribes, Federal land managers (National Park Service, U.S. Forest Service, Bureau of Land Management), the public, and other stakeholders. The stakeholders would work together to define the target (an amount of emission reductions, a level of visibility improvement, etc.) and to determine how quickly the target should be met.

Criteria for Determining if Continued Progress Toward the National Visibility Goal Will be Achieved by State and Tribal Air Pollutant Control Plans

The paper suggests criteria for determining if continued reasonable progress will be achieved by the control plans submitted to EPA by States and Tribes. Following are a few of the suggested criteria:

- Reductions in manmade visibility impairment are verified by tracking emissions from sources and monitoring visibility conditions over time.
- Continuing improvement is made to both remedy existing and prevent future impairment.
- Costs are taken into account.
- Unintended adverse and beneficial impacts of the program on energy, environmental, and other secondary factors are taken into account.
- Well-coordinated monitoring programs, administrative systems, funding, and other support mechanisms are in place to implement the program.

Long-Term Strategies

The control plans submitted by States and Tribes must include long-term strategies (10 to 15 years) for assuring continued reasonable progress toward the national visibility goal. The paper suggests several elements that

	could add flexibility and longer-term effectiveness to these strategies. For instance, States and Tribes could submit plans that include pollution prevention programs, identify studies and information needed by their next review of progress, provide estimates of emissions and economic growth, etc.
Best Available Retrofit Technology (BART)	The CAA requires that certain sources contributing to visibility impairment install BART. Current visibility rules limit BART to large stationary sources whose contribution is "reasonably attributable" to impairment in national parks or wilderness areas. Historically, BART proceedings have been expensive. The paper recommends that EPA consider allowing the development of additional or more innovative strategies to comply with the BART provisions.
Aerosol and Visibility Monitoring	The paper recommends that Federal visibility monitoring guidance that builds upon the current Interagency Monitoring of Protected Visual Environment (IMPROVE)* system be updated as soon as possible to improve the capture of ammonium nitrate and volatile organic particulate. Compatible data from other monitoring networks should be used in the short term where it will help provide understanding of conditions in a region.
Integrated Implementation of the Regional Haze, Ozone, and PM-2.5 Programs	Many of the same atmospheric chemical processes and weather conditions lead to the formation of ground-level ozone, PM-2.5, and regional haze. In addition, many of the same sources that contribute to PM-2.5 and ozone problems also contribute to regional haze. The paper suggests several ways States and Tribes could integrate strategies to address these three air quality problems. For instance, when assessing which sources are contributing to violations of the ozone and PM-2.5 standards, areas could also assess whether the same sources affect visibility conditions. Areas could also coordinate their progress reporting requirements for all three problems. The paper suggests that incentives be developed for areas addressing all three air quality problems.

* IMPROVE monitoring network measures visibility and characterizes particulate contributing to visibility impairment. There are currently 70 to 80 IMPROVE sites in operation, located predominately in rural areas.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the regional haze issue paper at the September, October, and November 1996 Subcommittee meetings. The Subcommittee discussed the relationship between the regional haze and the air quality standards planning processes. Some Subcommittee members contended that, in areas violating the ozone or PM standards, planning efforts and emission reduction strategies should be focused on addressing violations of the health-based standards, not on reducing regional haze. Referring to the RAMP/AOI proposal, one Subcommittee member commented that the proposed planning processes were becoming complex and confusing. Other members asked how efforts to address the secondary (welfare-based) air quality standards would relate to

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regional haze programs, and whether Class I areas would be considered AOVs. In addition, some Subcommittee members believed that a Federal "backstop" should be established to address areas that fail to meet their continued progress objectives.

The Subcommittee did not discuss regional haze as a separate issue after November 1996. EPA proposed the regional haze rule on July 31, 1997.

3.13 Transportation Conformity

The CAA requires metropolitan planning organizations to predict the overall air quality impact of highway and transit activities before they may take place. Local governments in areas with certain longstanding air quality problems, and in certain other areas, must show that the projects in their transportation plans will not cause new violations of the national air quality standards, worsen existing violations, or delay achievement of healthful air quality. This process is known as "transportation conformity." A work group identified the issues that are important to address when revising the Federal requirements for transportation conformity. As a result of the July 1997 Presidential Directive on implementation of the new and revised national air quality standards, the Subcommittee ended its discussion of transportation conformity. EPA is developing a new transportation conformity program that will apply to some of the areas ("transitional areas") where concentrations of ozone are higher than allowed by the national air quality standard for the pollutant.

A Simple Introduction to the Transportation Conformity Program

The transportation conformity program helps ensure that transportation planners in local governments consider air quality when developing transportation systems. The CAA requires metropolitan planning organizations to predict the overall air quality impact of road construction and other transportation-related activities before these activities may take place. Local governments must show that the projects in their transportation plans will not cause new violations of the national air quality standards, worsen existing violations, or delay achievement of healthful air quality. This requirement for "transportation conformity" applies to the areas with longstanding air quality problems, where air quality is worse than the standards allow, and to the areas which violated the standards but managed to clean the air. A State's air quality plan establishes a motor vehicle emissions budget, which represents the maximum motor vehicle emissions that would still enable an area to comply with the standards. Transportation investments may not be made unless the resulting emissions are within the budget. If motor vehicle emissions are predicted to exceed the budget, either the air quality plan or transportation plan must be modified before transportation projects can proceed.

Highlights of the Subcommittee's Discussion

In June 1997, the Subcommittee discussed how and where transportation conformity should apply in areas that potentially violate or potentially contribute to a violation of the new/revised standards for ozone and PM-2.5. The Subcommittee limited its discussion to the issues that are unique to the application of transportation conformity to the presumably larger areas, and in some cases more rural areas, that are likely to be subject to additional emissions control requirements to attain the new/revised ozone and PM-2.5 standards.

The Subcommittee's discussion preceded EPA's promulgation of national air quality standards for ozone and PM-2.5. Its discussion also preceded the Presidential Directive on implementation, which calls on EPA to develop the transportation conformity program that applies to certain areas ("transitional areas") that violate the revised

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standards for ozone. Recognizing the existence of this other forum, the Subcommittee terminated its discussion of transportation conformity.

3.14 Treatment of Areas in Which Air Quality Trends Indicate the Risk of Violating an Ambient Standard

The CAA does not require areas to take significant steps toward improving air quality until a violation of an air quality standard is monitored. In order to provide greater protection of human health and minimize the administrative burden on State and local agencies, the Subcommittee sees the need for EPA to encourage and assist States in identifying and developing programs for areas that are believed to be trending toward an air quality standard violation. Assistance could be technical help in interpreting air quality trends or providing examples of actions other areas have taken to avoid a violation. States or other planning bodies would be left discretion about how to respond to this information. Some Subcommittee members favored the option of a voluntary approach, including guidance from EPA. Some members strongly favored requiring mandatory action in areas at risk of violating a standard.

Current Process: Taking Action When Standard Is Violated

The CAA requires minimal action in areas where air quality standards are not violated, regardless of how close those areas may be to violating a standard. Once an area violates a standard, it is required to plan and implement control strategies. Problems with this approach include:

- *Burden on Public Health:* Allowing air quality to degenerate to the point that a violation of an air quality standard occurs results in adverse impacts on human and environmental health.

- *Burden on Economy:* The administrative actions and emission reduction measures required by the CAA in areas that violate air quality standards may be significantly more costly than preventative actions that could be used to keep a violation from occurring.

Proposed New Approach: Encouraging Action When Risk of Violating Standard Is Identified

The Subcommittee agreed that States have an obligation to maintain air quality standards and recommended that EPA notify States of any areas that appear to be trending toward violation of a standard, advise States of programs implemented by other States in similar circumstances, and provide other information and support to States as needed. States would be left discretion about what, if any, action to take. The members of the public interest community would have preferred that the recommendation go further by mandating that States take action in areas at risk of violating an air quality standard. They opposed the proposed voluntary approach because it involves granting incentives to States which could delay the deadlines and emission reduction requirements that would otherwise apply if the area fell into violation of the standard.

Proposed Voluntary Approach for Areas at Risk of Violating an Air Quality Standard

Identification of Area At Risk	EPA will assist States and Tribes in identifying air quality trends. States and Tribes will have maximum flexibility to select methods for determining which areas may be in danger of violating the standards.
Implementation of Voluntary Measures	No new regulatory requirements will be imposed in areas at risk of violating a standard. States and Tribes will be allowed the flexibility to choose the appropriate response in such areas.

Voluntary measures allow areas to tailor responses to their particular situations and regulatory institutional structures. In addition, voluntary approaches that involve the public serve to educate the public about its role in contributing to air pollution and the role that individuals can play in reducing it. On "ozone action days," for example, drivers and businesses voluntarily take actions to reduce their emissions of ozone-forming pollutants. The primary disadvantage of a voluntary approach is that it may not be pursued effectively. If air quality then continues to deteriorate, the area may eventually have to bear the public health and economic consequences of violating the standard.

Development of Guidance

EPA will encourage and assist States and Tribes to identify and develop programs for areas at risk of violating an air quality standard. For instance, EPA could provide guidance to States and Tribes on approaches being used in other areas at risk, as well as provide information on air quality trends.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the "Treatment Of Areas In Which Air Quality Trends Indicate The Risk Of Violating An Ambient Standard" issue paper in October 1996 and again in June 1997. The Subcommittee unanimously supported reducing the number of areas that slip into nonattainment. Some members would like a mandatory program to ensure consistency across areas in addressing this problem. However, the majority of the Subcommittee supported the development of guidance to assist State and local agencies in the development and implementation of a voluntary program.

3.15 Implementation of a "Too Close To Call" Category for Attainment Designation

This summary corresponds to the "Implementation of a 'Too Close to Call' Category as a Mechanism to Reduce the Impact of Meteorological Fluctuations on Attainment Designation and State Implementation Plans" issue paper. The Subcommittee discussed options for defining areas that are "too close to call." These options included the use of a standard error statistic for multiple years of monitoring data, and the use of a weight of evidence approach. The option of keeping the present attainment test methodology (and not implementing a "too close to call" category) was also discussed. The Subcommittee did not reach consensus on whether a category is warranted or on the method that could be used to define areas that are "too close to call." The Subcommittee agreed not to discuss the issue further.

NOTE: This issue paper was discussed prior to the promulgation of the revised primary and secondary ozone NAAQS, and prior to the President's memorandum to the EPA Administrator on implementation of the revised air quality standards. Therefore, the final form of the new standards was not known at the time the issue paper was prepared. In addition, impacts of the "transitional" attainment designation category were not considered in this issue paper (since the transitional category was announced after discussions of the "too close to call" issue).

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Background

The current attainment test for ozone is a "knife-edge" test, in that an area is either classified as attainment or nonattainment. The Clean Air Scientific Advisory Committee (CASAC) included the following statement in its closure letter on the primary standard portion of the Staff Paper on ozone dated November 30, 1995: "The present standard is based on an extreme value statistic which is significantly dependent on stochastic processes such as extreme meteorological conditions. The result is that areas which are near attainment will randomly flip in and out of compliance. A more robust, concentration-based form will minimize the 'flip-flops,' and provide some insulation from the impacts of extreme meteorological events. The [CASAC] panel also endorses the staff recommendation for creating a 'too close to call' category."

Options

Members of the STSWG developed the following options for "too close to call" areas:

1. Do not change the present attainment test methodology. This approach would not change current procedures and prevents confusion. Meteorological variations will continue to affect an area's attainment status.

2. Implement a new attainment test to determine whether an attainment area that briefly exceeds the level of the standards should be classified as "too close to call" or reclassified as nonattainment. The determination could be based on the standard error of ozone concentrations for multiple years (for instance, the standard error of the 3-year average for the fourth highest measured value). The approach would be applied only to areas that previously have been classified as attainment.

3. The approach in (2) above would be implemented, but would be extended to areas that were previously nonattainment. This approach would address areas that narrowly exceed the standards and were below the standard in years of good meteorology.

4. Use a "weight of evidence" approach in the attainment test. This approach would apply a statistical test similar to that used now and a deterministic test based on atmospheric modeling. If an area failed either test, a weight of evidence determination could be applied to reassess attainment status. The weight of evidence procedure could consider factors such as model performance, trend analyses, severity of episodes and incremental cost/ benefit analyses, and other factors.

5. Use 5 years of monitored data and ignore the highest and lowest values to calculate the mean from 3 out of the 5 years. (This option is made moot by the form of the final revised standards.)

The STSWG considered these options and provided no recommendations. Variability in meteorology was acknowledged, but the work group indicated that no scientific technique can completely eliminate this problem.

Highlights of the Subcommittee's Discussion

This issue paper was discussed in July 1996. The concepts presented in this issue paper are addressed in part by the form of the proposed standards. The Subcommittee did not reach consensus on whether a category is warranted or on a method that could be used to define areas that are "too close to call." The STSWG looked at this issue in depth and concluded that the issue cannot be entirely eliminated. The Subcommittee asked the work group to work with the Coordination Group to determine whether any real benefit would result from further discussing the issue. The issue was not addressed further by the Subcommittee.

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3.16 Air Quality Models and Emission Inventories: Their Development, Availability, Evaluation, Use, and Limitations

This summary corresponds to "The Modeling Process and Emission Inventories: Their Availability, Evaluation, Use, and Limitations" issue paper. Emissions inventories and air quality models are central to air quality management. Air pollution control agencies rely on these tools to develop control strategies to reach attainment of the national air quality standards. While air quality modeling and emission inventories are powerful air quality management tools, they do have limitations and uncertainties. The Subcommittee discussed using the air quality modeling and emission inventory development process to address violations of the new ozone and PM-2.5 standards. The Subcommittee reached agreement on several recommendations for improving the process and discussed the pros and cons of EPA "guideline" models. Some Subcommittee members strongly disagreed with the proposal to allow additional flexibility in model selection beyond what is currently allowed under EPA's modeling guidance.

A Simple Introduction to Emissions Inventories and Air Quality Models

Emissions inventories and air quality models are central to air quality management. Air pollution control agencies rely on these tools for a variety of purposes: to understand the cause of an air quality standard violation, to develop control strategies to reach attainment of the standard, to demonstrate that the selected strategies will lead to attainment of the standard by the CAA deadline ("attainment demonstration"), and to assess whether progress is made toward reaching the standard.

An emissions inventory is a compilation of information on sources that emit the pollutant of interest, this includes directly emitted pollutants and/or "precursor pollutants" which contribute to the formation of the pollutant of interest. The emissions inventory development process includes collecting information on the types of sources in an area, the amount of each pollutant emitted, the types of processes and control devices employed, and other data.

Air quality models mathematically simulate a pollutant's formation, transport, dispersion, and removal from the atmosphere. The modeling process consists of collecting the data inputs (meteorological data, air quality monitoring data, emissions inventory), applying the model, evaluating the results (using air quality monitoring data to test the ability of a model to estimate pollutant concentrations in the atmosphere over a range of meteorological and emissions conditions), and analyzing the control strategy.

Air quality modeling and emissions inventories are powerful air quality management tools with limitations. For instance, factors such as the methods used to estimate emissions rates, changes in the amount of emissions due to growth or added controls, and overlooked emission sources can introduce uncertainties into an emissions inventory. Uncertainties in the air quality modeling process can be attributed to constantly changing weather conditions, uncertainties in the emissions inventory, or the model's mechanism for simulating atmospheric chemistry processes.

Using Emissions Inventories and Air Quality Modeling to Address Ozone and PM-2.5 Problems

There is a large body of knowledge about ozone modeling and emissions inventories, but PM-2.5 and regional haze models and emissions inventories are not as well developed. The Subcommittee discussed the development, availability, use, evaluation, and limitations of emissions inventories and air quality models for addressing violations of the new ozone and PM-2.5 standards. The

Subcommittee generally agrees that air quality models exist to develop ozone and PM-2.5 control plans, but uncertainties are associated with them. The Subcommittee is particularly concerned about the uncertainty of PM-2.5 emissions estimates and the limited amount of PM-2.5 air quality monitoring data. However, the uncertainties should decrease as the air quality modeling and emissions inventory development process evolves.

The Subcommittee developed a number of statements which represent the general consensus about using air quality models and emissions inventories to address ozone and PM-2.5 problems. The need to improve the existing air quality modeling, especially model evaluation, and emissions inventory development process is an overwhelming theme. Improved emissions, air quality, and meteorological data are needed to increase confidence in the development of control strategies. In addition, scientific peer-review (review and publication in literature such as scientific journals) of air quality models and practices and emissions inventory development procedures should be a foundation of the overall analysis process. Public-private partnerships and stakeholder approaches are one potential mechanism to provide such information.

Recommendations for Improving the Emissions Inventory Development and Air Quality Modeling Process

The Subcommittee discussed the paper's recommendations summarized below.

Appropriate Use of Air Quality Modeling in Attainment Demonstrations and Progress Assessments

Although air quality models may have significant uncertainties, the Subcommittee did not find a better method of predicting future changes in air quality resulting from reduced emissions due to control requirements and regulations. More thorough evaluation of models will improve confidence in their use.

Identification and Treatment of Uncertainty in the Emissions Inventory Development and Air Quality Modeling Process

The Subcommittee agreed that, while it may be more resource-intensive, more rigorous quantitative uncertainty analysis is important to air quality management. Knowledge of the amount of uncertainty in the emissions inventory development and air quality modeling process could help policy makers choose more robust control strategies and help the public understand the complexity of the issues. In addition, it would help scientists develop methods to reduce uncertainty of future efforts.

Flexibility in Air Quality Model Choice for Attainment Demonstrations and Progress Assessments

To ensure consistency, EPA currently establishes a single "guideline" model for use in attainment demonstrations. The Subcommittee discussed the number of positive benefits associated with providing the opportunity to choose the most appropriate peer-reviewed model. Some Subcommittee members believe that competing air quality models should generate similar results if applied correctly. While some members supported flexibility, they did not support the use of closed models (models for which the source code is unavailable for inspection, modification, or testing) or of models whose costs or licensing conditions would inhibit the full testing of the model.

Some Subcommittee members strongly disagreed with the proposal to allow flexibility and would prefer EPA not relinquish its role in providing guideline models.

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Use of Models and Emissions Inventories in Identifying AOIs

Subcommittee members believe that scientifically well-founded methods should be used to identify AOIs. Less advanced techniques are viewed as being too likely to misidentify the appropriate areas and hinder the process. The use of a "quick-and-dirty" technique up front could slow the whole planning process.

Reducing Emissions Inventory Uncertainties

The Subcommittee believes that emissions inventory uncertainties are a key limitation of the air quality modeling process. The problem is most significant for PM-2.5, but uncertainties also exist in ozone and PM-10 inventories. Little attention has been paid to developing emissions inventories for ammonia, which contributes to the formation of PM-2.5, and directly emitted PM-2.5. Some Subcommittee members suggested developing a mechanism to provide sources with incentives to better characterize their emissions, but consensus was not reached on what mechanism is best. The Subcommittee believes that with a concerted effort, emissions inventory uncertainties can be reduced significantly.

Highlights of the Subcommittee's Discussion

The "Modeling and Emissions Inventory" issue paper was discussed at the August 1997 Subcommittee meeting. The Subcommittee discussed but did not agree on the paper's proposal that "no default or preferred model would be prescribed [by EPA]. The Subcommittee agreed that additional flexibility in choosing models would be beneficial, however, the recommendation for no default models could result in delays while models are developed and modeling protocols are negotiated. The Subcommittee agreed that air quality models are an important tool for predicting the effect of changed emissions on air quality and that EPA should identify and provide guidance on using up-to-date, peer-reviewed models. While uncertainties remain in the air quality modeling process, methods now exist that can and should be used to quantify these uncertainties so that they can be taken into account at the time that emissions control decisions are made. The Subcommittee agreed that improving the quality of the source emissions inventories is a key step toward reducing uncertainties and building confidence in the modeling process.

3.17 Utilization of an Exposure-Based Monitor System

Air quality monitors measure concentrations of pollutants in the atmosphere. Among the multiple objectives of the current monitoring system, monitors are used to determine the highest concentration of a pollutant in an area and the representative air pollutant concentrations in areas of high population density. Some Subcommittee members believe that, under the current approach, monitors often are not located where they would obtain the best estimate of pollution levels to which the overall public is exposed. However, others view the current approach as an appropriately conservative method that maximizes the protection of public health while also providing an adequate margin of safety, as required by the CAA. "Population weighting" or "exposure weighting" of monitors refers to locating monitors in areas of high population density as a way to reflect actual human exposure to a particular air pollutant. The Subcommittee discussed different approaches for implementing an exposure-weighted monitoring system but did not reach consensus on a recommended

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approach. The Subcommittee agreed not to discuss the issue further.

Current Air Quality Monitoring System

Air quality monitors are instruments that measure concentrations of pollutants in the atmosphere. EPA currently maintains nearly 4,500 monitoring sites throughout the United States. The monitoring program is divided into State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS). The objectives of SLAMS are to determine: 1) the highest concentration of a pollutant in an area; 2) representative air pollutant concentrations in areas of high population density; 3) impacts of large sources on air pollution levels; and 4) general background levels of pollutants (the concentration of a particular air pollutant that would exist in absence of manmade emissions of the pollutant). NAMS, which are a subset of SLAMS, can be divided into two groups: 1) urban-scale sites located in areas where pollutant concentrations are expected to be the highest and 2) neighborhood sites located in areas with both poor air quality and high population density.

Some Subcommittee members believe that, under the current approach, monitors often are not located where they would obtain the best estimate of pollution levels to which the overall public is exposed. However, others view the current monitoring approach as an appropriately conservative method that maximizes the protection of public health while also providing an adequate margin of safety, as required by the CAA.

Exposure-Weighted Monitoring Strategies

"Population weighting" or "exposure weighting" of monitors refers to locating monitors in areas where they reflect actual human exposure to, and health risks associated with, a particular air pollutant. In other words, monitors would be placed in areas of high population density.

Some Subcommittee members support exposure or population weighting of monitors as a way of prioritizing resources. They assert that certain air pollutants, ozone in particular, do not have a "threshold level" (for a given pollutant, the concentration below which human health effects are not observed). They also argue that, based on recent analyses, some national air quality standards may never be attained. They regard full health protection as impractical, if not altogether impossible, to achieve. In their view, one way to maximize the human health benefits resulting from efforts to address air pollution problems is to base monitoring siting decisions on some form of exposure or population weighting of monitors.

Other Subcommittee members are concerned that a population-weighted monitoring approach would sacrifice the health of individuals located in less populated areas.

Potential Exposure-Weighted Monitoring Approach

The Subcommittee discussed the following recommendations for implementing an exposure-weighted monitoring system. These recommendations are not consistent with the July 23, 1996, version of the issue paper.

- Risk assessment and societal issues should be confined to the standard-setting process.
- Air quality monitoring for designating areas as being in violation of an air quality standard should follow the form of the standard.
- Regardless of the standard, exposure-based monitoring should be used to prioritize resources and to measure progress toward attaining the standard.
- EPA should review the design and siting criteria for the current air quality monitoring networks for consistency with the form of the new standards. If a weighted average or exposure-based

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system is enacted, the original monitoring network may not be able to sustain the new system.

Consensus on these recommendations was not achieved by the Subcommittee. General agreement was reached, however, on the following statement: In evaluating different strategies, each of which would attain the standard, decision makers should give preference to strategies that provide improved air quality for the greatest number of people.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the exposure-based monitoring issue paper at the July 1996 Subcommittee meeting. The Subcommittee discussed the disconnect between the wording of the work group's recommendations and the July 23, 1996, document. The Subcommittee discussed the third recommendation at length. Many of the Subcommittee members did not support the recommendation and proposed that the paper be tabled due to a lack of support. The issue paper was not discussed again by the Subcommittee.

3.18 Control Strategies

The Subcommittee began discussions of the "Control Strategies" issue paper prior to the July 1997 Presidential Directive on implementation of revised national air quality standards. The initial mission of the paper was to recommend a process to be used for allocation of control responsibilities among national, prescribed, and discretionary control measures. After July 1997, the Subcommittee continued discussions to offer recommendations on control strategies issues that remained unresolved by the Presidential Directive. In particular, the Subcommittee's revised issues focused on the following three areas: 1) the initial round of control strategies for areas not covered by regional transport strategies or that will need additional local controls to meet the new standards; 2) the role, if any, of Federal or other backup plans in the event State or local control strategies fail to achieve the air quality objective; and 3) the consequences of EPA's failure or delay in implementing national control measures, or implementation of inadequate measures. The Subcommittee identified key questions and developed a framework to evaluate these issues. Although many Subcommittee members supported the framework and the outcome of its application to the issues, the Subcommittee did not reach consensus on the underlying issues or the framework.

Background: Goals of Successful Air Pollution Control Strategies

The success or failure of any plan to attain healthful levels of air quality is based on emissions reductions that result from successful air pollution control strategies. Control strategies should result in *timely* and *certain attainment* of air quality standards, be developed in an environment of *flexibility* so that the strategy can be tailored to address an area's air quality needs most efficiently, and provide for the ability to *assess the effectiveness* of the strategy on an ongoing basis. The balance between national control measures, measures that are Federally required based on an area being nonattainment, and allowing States the discretion to choose control measures has changed through the years.

The Subcommittee took a fresh look at national, prescribed, and discretionary measures in the context of new standards for ozone and PM, and a new program to address regional haze. To help focus its discussion of underlying issues, the Subcommittee discussed an alternate route for SIP development and implementation that provides flexibility, ensures attainment in a timely manner, and builds in a formal assessment of the effectiveness of applied control strategies.

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Key Questions for Control Strategy Development

The following chart summarizes the key questions and the recommendations discussed by the Subcommittee. The recommendations represent the general agreement of some members of the Subcommittee. Some members strongly disagree with the recommendations, believing among other things, they are contrary to the language and purpose of the CAA.

Questions	Issue Paper Recommendations
1. ***To what degree should the initial round of control strategies offer States flexibility to tailor control strategies to an area's air quality needs?***	Most discretion. National measures that are clearly identified and required by the CAA continue to be adopted and implemented according to statutory direction and deadlines. An air quality authority has the discretion to adopt those additional control strategies (including innovative and nontraditional strategies) needed to meet an area's air quality objectives. *Note: This recommendation is only valid when coupled with the "Backstops" option from Question 2.*
2. ***How can a State assure EPA, the public, and stakeholders that an area's control strategy will achieve timely and certain attainment of air quality standards?***	Backstops. Initially, the air quality planning agency has discretion to develop and implement a control strategy designed to meet air quality objectives. Only when the strategy fails to show reasonable further progress prior to the attainment date do pre-adopted contingency measures sufficient to bring the area into attainment "kick in." *Note: This recommendation is only valid when coupled with the "Most discretion" option from Question 1.*
3. ***How should the situation be handled where national measures are not implemented or are not timely? What is the consequence to the regulatory agency?***	The Subcommittee was unable to make recommendations on the question or subquestions due to insufficient time for full discussion. Support for some options was stronger than for others, as indicated below. A. For national measures that EPA fails to develop on schedule: Measures should be credited in the SIP from the target date, regardless of actual implementation date. Participants of a straw poll indicated their support for this option, although some suggested amendments or expressed caveats. B. For national measures that are not implemented: The options which received some support were: 1) EPA should be responsible for substituting measures sufficient to achieve equal reductions; and 2) States should substitute adequate discretionary measures, either at or after the original target date. C. What should be the consequences to the regulatory agency? No clear support was shown for any single option; grace periods and waiver of sanctions all received some support.

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Control Strategies Framework

The control strategies issue group developed the following framework to focus discussions on the underlying issues:

- States and local air management agencies are offered the opportunity to prepare an "alternative" SIP using any mix of innovative and nontraditional measures (e.g., economic incentives, voluntary approaches), together with traditional measures such as command and control.

- The "alternative" SIPs submitted to EPA must include progress targets and deadlines, and methods to be used to assess whether the targets are met and to predict the plan's future success. These SIPs must also include contingency measures sufficient to correct shortfall(s) of the plan, and ensure attainment within the appropriate statutory deadline. If the alternative plan is falling short of its targeted emissions reductions for any reason, these contingency measures would be automatically triggered.

- States or local air management agencies would have some period of time from the date of being designated as violating a standard to attain the standard or to demonstrate that the measures will achieve attainment by the CAA deadline. This demonstration would be conducted using the methodologies and performance targets developed by the State, written into the SIP, and subject to EPA's review and approval.

This alternative approach provides State and local air management agencies with the flexibility to respond to local conditions in the most efficient manner. It also provides the public with a higher guarantee of attainment of the standards by the CAA deadline through the use of the progress assessment built into the process. Finally, the contingency requirement offers a further guarantee that attainment will be achieved in a timely manner. A number of Subcommittee members objected to this proposal, asserting among other things that there is too much time allowed before the backstops kick in, an overreliance on the contingency measures, and a need for a minimum upfront control obligation.

Highlights of the Subcommittee's Discussion

This issue paper was discussed at the April, June and October 1997 Subcommittee meetings. Prior to the Presidential Directive on implementation, discussion focused on the appropriate balance between control measures prescribed by EPA and discretionary measures adopted by States. There was discussion of the need to identify the appropriate "level of governance" for specific measures. Some measures were specifically identified as appropriate for the Federal government, such as those dealing with products in interstate commerce (consumer products and cars).

Some Subcommittee members favored additional national control measures, while others emphasized the need to take note of national measures that are already planned. Some Subcommittee members emphasized the need to address the situation where national control measures are delayed or are less effective than initially planned. Some members suggested that EPA should be responsible for developing substitute measures that achieve an equivalent emission reduction. State representatives were particularly concerned about emissions source categories for which the States are pre-empted from developing their own regulations by Federal law. Some commenters favored input by States and regional planning bodies in the development of national measures.

For subnational control measures, many Subcommittee members favored State discretion for new control measures, with some support for Federal backstops. However, the need for some Federal

prescription in order to achieve assured results and preserve equity was also recognized. Some Subcommittee members raised the idea of the "States as laboratories" for policies that might then be adopted on a wider scale.

After the Presidential Directive, discussion focused on the degree of discretion allowed to States. Many Subcommittee members favored maximum flexibility, indicating that this flexibility is needed in order for each State to develop cost-effective measures. However, there were serious concerns that the recommendations did not comply with the language and purpose of the Clean Air Act.

3.19 Using Economic Incentives to Achieve Air Quality Objectives

Economic incentive programs provide a monetary incentive to reduce emissions in the most cost-efficient way. They include trading programs and emission fees, among others. Economic incentives hold promise for achieving necessary pollutant reductions with economy, certainty, timeliness, and equity. To assist air quality regulators, the Subcommittee developed a general analytical framework to guide consideration of using economic incentives to achieve emission reduction and air quality objectives. To illustrate application of the framework, the Subcommittee also discussed the issues that are important to address when developing an economic incentive to reduce emissions from woodstoves, lawn and garden equipment, or large diesel trucks. It also discussed the issues that are important to address when developing a Clean Air Investment Fund and a program to achieve early emissions reductions. The Subcommittee was not asked to reach consensus on recommended designs of specific economic incentives or economic incentives for specific types of sources of air pollutant emissions. The subcommittee reached consensus on five recommendations pertaining to the way in which regulators should evaluate the desirability of economic incentive programs during planning, the preparation of guidance for developing economic incentive programs, and support for demonstration and pilot projects.

Reasons to Use Economic Incentives

Economic incentives include trading programs, emission fees and other financial mechanisms, and timesavers such as special access to a high-occupancy vehicle lane for carpools. In addition, the CAA Amendments of 1990 identify 16 specific transportation control measures as economic incentives. EPA is using an emission trading program to reduce emissions of sulfur dioxide (which causes acid rain) from electricity generating stations and is offering guidance to the States on a nitrogen dioxide trading program involving the eastern United States. California is using an emission trading program to reduce ozone in Los Angeles.

Economic incentives hold promise for achieving pollutant reductions with economy, certainty, timeliness, and equity. For example, emission trading can limit total emissions from regulated facilities, reduce expenditures on emission control technology, and promote control technology innovation and diffusion.

In the world of air quality policy, there is a tendency to treat economic incentive mechanisms as an afterthought (i.e., the last resort when traditional regulatory approaches are infeasible or fail). Incentives should be considered on an equal footing with all other air quality control measures.

Analytical Framework

The framework is a general guide for air quality regulators who are considering use of an economic incentive to achieve an

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emission control objective. The framework will help them identify many of the significant technical and political issues that arise when determining whether to use an incentive-based mechanism. The framework applies equally well to any type of source. It divides the task of designing incentives around four basic questions:

1. What are the sources of emissions of concern?

2. What are the opportunities for controlling emissions from the sources of concern?

3. What economic incentive mechanisms are available?

4. What considerations must one take into account as one engages the process of matching the mechanisms with the source categories, and the opportunities for emission control within those categories?

The framework also includes lists of the attributes that make different types of incentives work well.

The framework also considers more refined trading programs than one-for-one emissions trading programs. Ozone, particulate matter, and regional haze are examples of air pollution problems in which the location of a source relative to a particular receptor is one of the determinants of a particular effect.

Clean Air Investment Fund

At its discretion, a State, Tribe, or local government could establish a Clean Air Investment Fund to allow sources with control costs (for ozone or PM) exceeding a certain level the option of paying a fee at that level instead of making on-site emission reductions. The manager of the fund would then use resources from the fund to seek less expensive emission reductions of equal or greater magnitude. The fund could improve the economic efficiency of an area's plan for achieving the national air quality standards. This goal can be achieved through one or both of two basic strategies. The first is to stimulate the development of clean air technologies with investments financed by the fund. This strategy can also give local governments flexibility to seek out targets of cost-effective emissions reductions that, for one reason or another, lie outside of, or are constrained by, the regulatory system. The second strategy provides a compliance option ("relief valve") for emission sources when emission control costs reach or exceed the designated threshold. It should also be noted that there is a technological innovation incentive associated with the cost threshold (payment level) as well, but one that works directly through the regulated firms rather than through the fund managers. The Subcommittee discussed general design principles and the most important issues to address when creating a fund, such as the threshold for paying into the fund and the use of the fund.

Early Emissions Reductions

Given the long lead times for submitting air quality plans and attaining the standards for ozone and PM-2.5, society would benefit from reductions in emissions that occur ahead of this schedule. In addition, the cost of implementing reduction programs "all at once" is extremely high. Creating incentives for early reductions creates benefits that include earlier realization of improved public health, increased experimentation with alternative technologies, incremental improvements of existing technologies, and incentives for developing and implementing the least expensive technologies first. At the same time, there is concern that programs to foster early reductions may ultimately lead to increases in emissions after the attainment date and therefore delay attainment.

The Subcommittee identified general issues which are important to address to ensure that incentives provide for real emissions reductions and achieve all levels of air quality progress at a more rapid rate. First, because early reductions are measured against a baseline showing mandated emissions reductions, the EPA should determine the rules for establishing baselines to ensure uniformity in States' early reduction

programs. Second, to avoid negative incentives, early reduction programs should provide assurance that the sources who voluntarily reduce emissions ahead of schedule will be treated equitably if a State imposes mandatory reductions. Third, banking and trading programs are seen as a potentially useful approach for gaining early reductions. Fourth, States should establish caps that can be modified based on an evaluation of emissions under the program. If emissions are too high, the cap can be tightened, which raises the value of banked emissions. Sources expecting this outcome therefore have incentive to make early reductions.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed economic incentives in October 1996, and again in February, June, October, and December of 1997. The Subcommittee reached consensus on the following recommendations.

1. Both economic incentive programs and traditional programs should be evaluated with a common objective: assurance that the intended environmental results will be achieved.

2. EPA and the States should identify methods to encourage adequate planning emphasis for economic incentives where appropriate, so that they are considered among the initial approaches when developing a regulatory program.

3. The CAAAC, through its other standing committees, should ensure the further development of economic incentive approaches to achieve air quality goals.

4. The CAAAC should encourage EPA to develop appropriate policy guidance so that local, State, and regional authorities can efficiently develop and implement economic incentive programs.

5. Demonstration or pilot projects should be encouraged, through appropriate means, to provide information for the development of innovative emission control programs.

3.20 Reasonable Further Progress (RFP)

RFP is required by the CAA to ensure that continued progress is made toward achieving the air quality standards by the appropriate deadlines. In the past, States have had to reduce emissions by a specified amount annually in order to meet RFP requirements for ozone. However, because of the complex chemistry of ozone formation in the air, this specified amount of emissions reductions did not necessarily make sense in every part of the country. The Subcommittee discussed a more flexible approach for making progress toward the new ozone and PM-2.5 air quality standards. The "Reasonable Further Progress" issue paper introduces an innovative flow diagram that illustrates how an area would develop and implement its RFP program (see Figure 3-1). Following the iterative RFP process in the diagram, areas would review their progress toward attainment at fixed intervals. The reviews would consist of tests to determine if the control strategy plan is on track and effective. There was substantial support in the Subcommittee for the iterative RFP process portrayed in the flow diagram. The Subcommittee also identified and discussed a number of key issues related to improving the existing RFP process and reached consensus (or near consensus) on several of them.

The Traditional Approach to Making Progress toward Air Quality Standards

The purpose of the RFP program is to ensure that areas make continued progress toward reaching the air quality standards. For areas violating the ozone standards, RFP has been defined in the past as a specified amount of annual emissions reductions of pollutants contributing to the formation of ozone ("precursor pollutants"). Areas violating PM standards have been required to reduce emissions of particulate, but they have not had to achieve a specified amount of reductions. In their control strategy plans submitted to the EPA,

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States are required to describe how their emissions reductions will be made. States must also periodically demonstrate to EPA that progress is being achieved and that the air quality standards will be reached by the CAA deadlines.

The traditional RFP process can be improved because not all ozone and PM-2.5 problems are alike. Ozone and a significant portion of PM-2.5 are not directly emitted from sources; they are formed in the air through complex chemical processes. Levels of ozone and PM-2.5 are dependent on the mixture of precursor pollutants in the air, sunlight, humidity, and other factors. The conditions leading to the formation of ozone and PM-2.5 can vary greatly from one area to the next. Two areas that have the same levels of PM-2.5 (or ozone) will not necessarily need to reduce emissions of the same pollutants by the same amounts. The traditional approach to progress toward the standards does not provide enough flexibility to States to tailor their RFP programs to local conditions.

A New Approach to Making Progress

The Subcommittee developed a framework for a new iterative approach to RFP. The proposed approach would be more flexible, allowing more consideration of effectiveness in designing RFP programs. Another feature of the proposed process is that areas could use other methods, in addition to the traditional emission reduction method, to measure progress. The centerpiece of the proposed framework is the RFP process flow diagram in Figure 3-1. There was substantial support in the Subcommittee for the RFP process flow diagram and the recommended framework summarized below.

Framework For A New Approach To Reasonable Further Progress

Iterative RFP Process

The flow diagram in Figure 3-1 illustrates how an area would develop and implement its RFP program. Following the iterative process in the diagram, an area would review its progress toward attainment at fixed intervals. The progress reviews would consist of tests to determine if the control strategy plan is on track and effective. If a progress review indicates that the plan is not on track toward attainment, the iterative process allows for mid-course corrections to the control strategy plan. However, the area would not be excused from making continual progress toward attaining the standard while the correction is being developed. Consequences for failing to meet RFP requirements, such as sanctions and penalties, would be determined on a case-by-case basis.

Method of Measuring Progress

Three methods were proposed for measuring progress toward the air quality standards: emissions reductions, completed project or administrative milestones, and air quality improvements. The emissions reduction method would involve making sure overall emissions from selected sources in the area are decreasing over time. Progress based on project or administrative milestones would involve checking off each completed action necessary to execute the whole control strategy. As an example, for a control strategy that includes a light rail system, progress could be measured by approval of city bonds, completion of construction permits, and, finally, the actual construction of the light-rail system. The air quality method would involve monitoring to ensure that air quality improves over time until the standards have been achieved.

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The Subcommittee recommended that the RFP process should have three components to measure progress: 1) emission reductions; 2) project milestones; and 3) air quality. A progress review should consist of tests to determine if each of these three parameters is on track. The Subcommittee agreed that both the emission reduction and project milestone (referred to as "administrative") tests should be mandatory with consequences for failure to meet them. The Subcommittee agreed that assessment of air quality adds value to the RFP process, but could not agree on whether its use should be mandatory or at the States' discretion. The Subcommittee also called for a new workshop to further examine the issue of measuring progress.

Type and Quantity of Emission Reductions

The Subcommittee discussed whether the type and quantity of emission reductions which constitute RFP should be set on the national level or on the airshed level (i.e., the spatial extent of the air quality problem, which could be local, State, or regional). Under a national approach, each area would annually reduce ozone precursor emissions or PM-2.5 direct/ precursor emissions by a specified amount. The EPA would establish these annual emission reduction targets. Under an airshed approach, each airshed would determine its annual emission reduction target. The airsheds' annual targets would have to meet the CAA requirement of attaining the standard as "expeditiously as practicable." In either approach, stakeholders agreed that each area should be given the flexibility to determine which precursor pollutant(s) to reduce to meet its emission reduction obligation.

Most stakeholders agreed to an approach with some degree of standardization or uniformity at the national level. For some stakeholders, this would consist of an EPA-mandated percent emission reduction; for others, it would consist of implementing emissions reduction measures that meet standardized national cost-effectiveness tests. After implementation of the standardized program, the airshed would have the option to customize the remainder of the program necessary to achieve attainment.

End-Loaded Strategies

End-loaded strategies are control strategies that do not result in emission reductions for some time (e.g., mass transit projects). The Subcommittee agreed to allow end-loaded strategies as part of a multi-strategy emission reduction program. In general, the percentage of the total emissions reductions assigned to end-loaded strategies should not be a predominate part of the emission reductions needed for attainment. The actual portion of emission reduction obligations allocated to these measures should be tailored to the unique needs of each area. Before the actual emission reductions are achieved, RFP credit should be accrued based on achievement of milestones considered critical to successful implementation of the measure (i.e., planning milestones, investment milestones, political milestones, etc.).

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Iterative RFP Process

Step 1. **SIP Development**	The iterative RFP process begins with the development of the SIP. In developing its SIP, an area devises a control strategy to reduce air pollutants in order to achieve the standard by the attainment date. From the control strategy, the tests for determining if RFP requirements have been met (i.e., emission reduction or project milestones) are identified.
Step 2. **SIP Implementation**	The area implements the control strategy developed in the SIP.
Step 3. **Attainment Tests**	At a predetermined period specified in the SIP, an area performs tests to determine if it has achieved the air quality standard. If the standard has been achieved, the area is redesignated as an "attainment area" by EPA. As part of the redesignation process, the area must submit to EPA a maintenance plan demonstrating how air quality will be maintained. If the area has not achieved the standard, it then proceeds to step 4 of the process.
Step 4. **RFP Tests**	An area that has not achieved the air quality standard must determine whether it has met the progress targets defined in the SIP by conducting both administrative (i.e., project milestones) and emission reduction tests. Areas that pass both tests would continue implementing the control strategy in the SIP. Areas that fail either of the two tests would determine the cause of failure and develop the appropriate corrective actions. When any test is failed, any potential penalty, sanction, or contingency measure would be decided on a case-by-case basis.
Step 5. **Air Quality Indicators**	After completing its review of administrative and emissions reduction progress, an area could assess whether air quality improvements are consistent with the progress indicated by the RFP tests. If the air quality assessment shows the control strategy is on track, the area would continue the implementation process until the attainment and RFP tests are next required (Figure 3-1, Box 3).
Step 6. **Mid-course Corrections**	There may be situations where improvements in air quality are not realized even though the RFP tests indicate that there should be. In these cases, the area determines the reason(s) for the lack of improvement in air quality. If the reason(s) are not related to the control strategy, the area would proceed with the implementation process (Figure 3-1, Box 3). If the problem is with the control strategy, the area would then develop a mid-course correction to the implementation plan (Figure 3-1, Box 1).

Highlights of Subcommittee's Discussion

The Subcommittee discussed the "Reasonable Further Progress" issue paper at the February, April, and October 1997 Subcommittee meetings. The Subcommittee discussed the use of air quality methods as a measure of RFP. Some members supported the use of air quality tests to check whether the right emission reductions were being made to yield the necessary air quality improvement. Air quality tests could help prevent costly emission reductions that do not result in the desired air quality improvements. In addition, since achievement of the air quality standard is the ultimate goal, it makes sense to measure progress in terms of air quality. However, other members had concerns with the use of air quality to measure progress. Some believe that RFP should be directly tied to real, quantifiable emission reductions, not to something as variable as air quality. One member commented that it is possible for areas to

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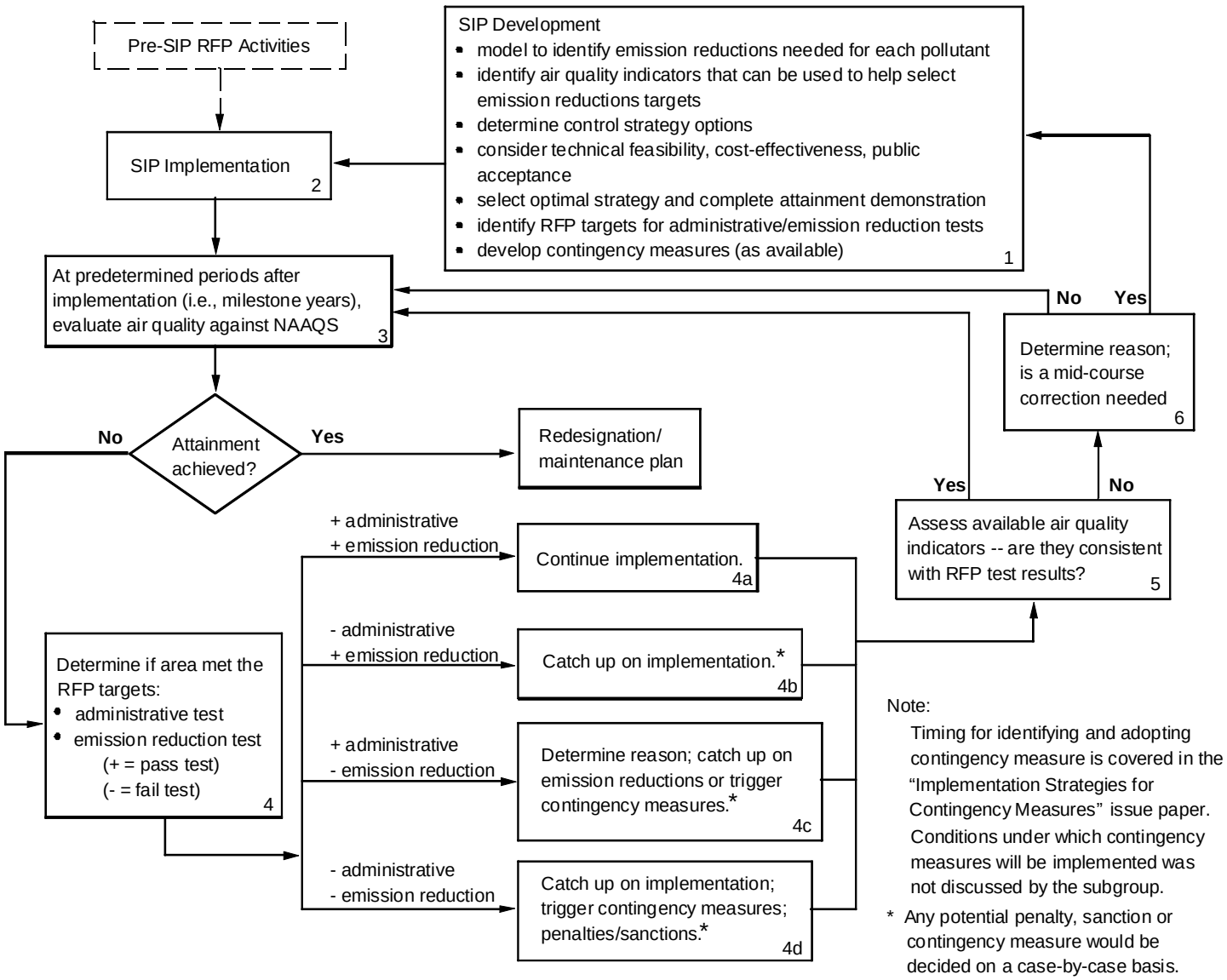
meet an air quality test without achieving adequate emission reductions. Still others supported using air quality tests to make RFP programs more effective but questioned whether practical methods of measuring air quality are available.

The Subcommittee also discussed RFP requirements for areas that cannot demonstrate attainment. Some members felt that an alternative RFP process should be set up for those areas. Others opposed, reasoning that, if an area is allowed an "out" because reaching attainment is difficult, they would take that option.

Some Subcommittee members were concerned about giving areas too much flexibility to design their RFP programs. Areas could wait to reduce emissions until it is too late to meet attainment deadlines. Other Subcommittee members were concerned about the timing of the contingency measures in the event of any RFP failures. They wanted to ensure that contingency measures would "kick in" automatically without any delays in progress.

Figure 3-1. Iterative RFP Process Flow Diagram



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3.21 Reviewing New Sources of Air Pollution Prior to Construction

This summary corresponds to the "New Sources: Considerations for the Implementation of New Air Quality Standards/Regulations" and "New Sources: Considerations for the Implementation of New Air Quality Standards/Regulations: Phase II Issues" issue papers. The CAA requires the owners of large, planned sources of air pollutant emissions to obtain an air pollution permit before beginning construction. The CAA also requires the owners of large, planned modifications to existing facilities to obtain an air pollution permit before beginning construction. The process of reviewing permit applications is called "new source review." The purpose of new source review is to help ensure that air quality in areas with either longstanding air quality problems or clean air does not worsen while still allowing economic growth. Federal regulations require installation of emission abatement technology on large new or modified facilities. On the basis of its review of the potential impacts of new emissions on the environment, a State may require the permit applicant to take additional steps to reduce emissions. The Subcommittee identified the issues that are important to address when revising the Federal requirements for new source review. The Subcommittee did not reach consensus on recommended changes to the new source review program. As a result of the July 1997 Presidential Directive on implementation of revised national air quality standards, the Subcommittee ended its discussion of new source review.

The Basics of New Source Review

The CAA requires the owners of large, planned sources of air pollutant emissions to obtain an air pollution permit before beginning construction. The CAA also requires the owners of large, planned modifications to existing facilities to obtain an air pollution permit before beginning construction. The law requires large, new or modified facilities to limit emissions to the rates achievable with installation of specified emission abatement technology. Depending on the area, those limits either correspond to the "best available control technology" (typically in "attainment" areas) or equal the "lowest achievable emission rate" (typically in "nonattainment" areas).

In areas with clean air, where air quality does not violate the national air quality standards, the permit applicants must show that their emissions will neither lead to violation of the standards nor degrade air quality by more than a certain amount (the Prevention of Significant Deterioration, or PSD, program). This amount, called an "increment," is the total, maximum allowable increase in concentration which EPA allows for a pollutant. If a facility potentially affects air quality in a national park or wilderness area, the owner must project the impact of the facility's emissions on visibility in the national park or wilderness area. In areas with air which violates a national air quality standard, the permit applicants must offset any increase in emissions by obtaining emission reductions from sources in the same area.

The process of reviewing permit applications is called "new source review." The purpose of new source review is to help ensure that air quality in areas with either longstanding air quality problems or clean air does not worsen while still allowing economic growth. The CAA, as well as State and Federal regulations determine the basic structure of new source review. State air quality regulators conduct the review, determine whether to grant the air pollution permits, and set emission limits.

Issues to Consider When Modifying the Federal New Source Review Program

The federal program is closely tied to designation of certain areas of the country as

"attainment" or "nonattainment" areas. The latter are areas with air quality problems that are worse than the standards allow. Historically, designation of an area as a nonattainment area implied mandatory imposition of multiple requirements for emissions reduction. During the Subcommittee's discussions of the Federal new source review program, major changes to the process of designating nonattainment areas were also addressed. The proposal before the Subcommittee would replace nonattainment areas with a new type of air quality control region. This region would comprise one or more "areas of violation" (areas where a violation of a national air quality standard is measured) and one or more "areas of influence" (a geographical area containing manmade and natural sources which contribute to the areas of violation — this may very well include transport). The proposal also built on the concept of multi-State planning bodies to develop recommendations for the States' air pollution control plans.

How should EPA adapt the Federal new source review program to a new regulatory environment in which areas with air quality problems do not automatically impose control requirements, and where regional planning bodies operate? Although the Subcommittee did not reach consensus prior to the issuance of the Presidential Directive which took the issue off the table, it did identify general principles and four options.

Principles

1. The selected option should be as cost-effective as possible.

2. Flexibility should be built into the selected option to reflect the unique aspects of various regions (i.e., control strategies, addressing site-specific impacts, etc.).

3. The selected option should encourage real reductions in emissions and should provide market incentives, where possible, to achieve the reductions.

4. Market mechanisms, if utilized, would not override local ambient conditions (i.e., hot spots would have to be addressed).

Options

1. Require the same planning and control measures for all large, planned new or modified facilities in the areas which influence air quality in downwind areas of violation.

2. Require some control measures for all large, planned new or modified facilities in the areas which influence air quality in downwind areas of violation. Allow regional planning bodies to establish different requirements for facilities in different parts of the AOI depending on their relative contribution.

3. Large, planned new or modified facilities (in the areas which influence air quality in downwind areas of violation) which comply with new source performance standards and offset remaining emissions with reductions from other facilities in the same area are not subject to the requirements of the Federal new source review program that apply to areas with clean air.

4. Allow regional planning bodies to develop their own new source review program, which may include adding a trading and banking program between new and existing large sources for offsets and other new source review requirements. This option recognizes those statewide or regional processes currently in place, such as the GCVTC and the OTAG, which may result in an emission trading program or a cap on emissions from the regulated sources.

Highlights of the Subcommittee's Discussion

The Subcommittee discussed the "New Source Review" issue paper at the

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September and November 1996 Subcommittee meetings. The Subcommittee's discussion of the treatment of large, planned sources of air pollution followed the activity of another Subcommittee which the EPA convened to comprehensively reexamine the Federal new source review program. Representatives of Federal agencies serving on the Implementation Subcommittee expressed concern that it might interfere with or contradict the other process. However, the FACA Subcommittee established to reexamine the Federal new source review program was narrowly focused on reforming the current program. The Implementation Subcommittee had the opportunity to think beyond the limits of the current new source review program and diligently worked to avoid overlap with the Subcommittee on New Source Review. Some Implementation Subcommittee members opposed far-reaching changes that potentially replaced all or part of current new source review requirements or limitations on emission rates (i.e., best available control technology and lowest achievable emission rate requirements) with a market-based trading and banking system. Other Subcommittee members expressed interest in changes which would allow the sources subject to new source review program requirements to satisfy those requirements through a market-based trading and banking system that provides incentives for less expensive methods of reducing emissions.

The Implementation Subcommittee's discussion preceded EPA's promulgation of new national air quality standards for ozone and PM-2.5. Its discussion also preceded the related Presidential Directive on implementation, which calls on the Agency to accelerate revisions to the Federal new source review program. Based on the Presidential Directive, the Implementation Subcommittee terminated its discussion of new source review, including such additional issues as PM-2.5 PSD increments and the process of modeling to predict the impacts of large, planned facilities on air quality.

3.22 Opportunity Matrix for Ozone, Fine Particulate Matter (PM-fine), and Regional Haze Integration

Because ozone, PM-2.5, and regional haze can be produced by the same pollutants from many of the same sources, including power plants, cars, paints, and solvents, there may be opportunities to design control strategies to address ozone, PM-2.5, and regional haze simultaneously. The Subcommittee developed a matrix (table) containing numerous ozone, PM-2.5, and regional haze control measures. The matrix consolidates information on ozone, PM-2.5, and regional haze into one table, and identifies opportunities for addressing the three air quality problems at the same time. The matrix was also intended to support the development of the "Integrated Implementation" and "Control Strategies" issue papers. The Subcommittee did not reach consensus on the information presented in the matrix.

Similarities of Ozone, PM-2.5, and Regional Haze

Ozone and significant portions of PM-2.5 and regional haze are produced in the air through complex chemical processes. The "precursor" pollutants that can lead to the formation of ozone are NO_x and VOC. The precursor pollutants that can contribute to the generation of PM-2.5 and regional haze include sulfur oxides (SO_x), ammonia (NH_3), NO_x, and VOC. PM-2.5 can also be directly emitted into the air (primary PM-2.5). Other factors that affect the amounts of ozone, PM-2.5, and regional haze formed in the air include sunlight, humidity, wind, and the mixture of pollutants in the air.

A Matrix of Opportunities for Controlling Ozone, PM-2.5, and Regional Haze

Because ozone, PM-2.5, and regional haze can be produced by the same precursor pollutants from many of the same sources, including power plants, cars, paints, and solvents, there may be opportunities to design

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control strategies to address more than one of these air pollution problems simultaneously.

The Subcommittee developed a matrix containing numerous ozone, PM-2.5, and regional haze control measures. The matrix consolidates information on ozone, PM-2.5, and regional haze into one table, and identifies opportunities for addressing the three air pollution problems at the same time. The matrix was also intended to support the development of the "Integrated Implementation" and "Control Strategies" issue papers.

Information Presented in the Matrix

The matrix is organized into columns of source category, control opportunity, and control efficiency. Listed for each source category are control measures (control opportunities) that could be used to reduce emissions of pollutants from that source category. Symbols are used to indicate how efficiently or how well each control measure reduces directly emitted PM-2.5, SO_x, NH_3, NO_x, and/or VOC. In addition, preliminary work on listing adverse impacts of the various control measures was started.

The symbols indicate the estimated relative efficiency of each control measure. Control efficiencies between 80% and 100% have three plus signs (+++). Efficiencies between 50% and 80% have two plus signs (++), and those between 0% and 50% have one plus sign (+). Control techniques that decrease one pollutant while increasing another were assigned a negative (-) sign (e.g. selective catalytic reduction of NO_2 with NH_3 decreases NO_x emissions significantly but increases NH_3 emissions).

Although sunlight, humidity, and other complicating factors affect the levels of ozone, PM-2.5, and regional haze in the air, the matrix does provide a rough estimate of those control measures which could improve more than one of these air pollution problems at the same time. It is important to note that the success of any emission reduction strategy depends on an area's particular conditions. For instance, the relationship of ozone formation and VOC or NO_x emissions is not linear. Although ozone is formed from NO_x, sometimes a reduction in NO_x can actually increase ozone levels.

Measures with at least one plus sign in either the NO_x or VOC columns could reduce ozone concentrations in an area. Measures with at least one plus sign in the SO_x, NH_3, NO_x, VOC, or directly emitted PM-2.5 columns could reduce PM-2.5 levels in an area. Therefore, if a measure has at least one plus sign in either the NO_x or VOC columns *and* at least one plus sign in the primary PM-2.5, SO_x, or NH_3 columns, it has the potential to reduce ozone, PM-2.5, and regional haze.

Sources of Data Used to Develop the Matrix

The data used to develop the matrix came from a diverse set of sources, including documents from the OTAG, the GCVTC, State and Territorial Air Pollution Program Administrators / Association of Local Air Pollution Control Officers (STAPPA/ ALAPCO), the EPA Office of Mobile Sources (OMS), and several States, as well as from background documents prepared for the NAAQS Regulatory Impact Assessments (RIAs), and European studies of ammonia emissions.

Highlights of the Subcommittee's Discussion

The Opportunity Matrix was discussed at the April 1997 Subcommittee meeting. It was developed to identify opportunities where control technologies could support an integrated (addressing more than one of the air pollution programs —ozone, PM-2.5, or regional haze) air quality management plan, as well as to identify techniques which may have an adverse impact on one pollutant while controlling another. Because the atmospheric processes that form ozone, PM-2.5, and regional haze are complex and nonlinear, many members of the Subcommittee objected to the inherent

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simplifications in the matrix. Additionally, some members were concerned that ongoing air quality programs were not reflected in the matrix, neither in the emission estimates nor the potential control technologies listed. However, other members found the matrix useful because it demonstrates that technologies are available which will facilitate integration of these air pollution programs. Finally, the Subcommittee discussed whether the matrix should include control technology costs. The Subcommittee agreed that the development of the Opportunity Matrix is a complex and difficult task and that the Subcommittee members would not be able to reach full agreement on the information presented. The Subcommittee agreed to stop working on the matrix and did not discuss it further.

3.23 Implementation Strategies for Contingency Measures

This paper refers to the "Phase II Implementation Strategies for Contingency Measures" and "Integration of Contingency Measures Issues with Control Strategies and the President's Directive" issue papers. Control strategy plans for nonattainment areas must contain contingency measures that assist the area in meeting reasonable further progress requirements or achieving the air quality standards by the appropriate deadlines. Areas redesignated as attaining the air quality standards must also include measures in the maintenance plan to promptly correct a violation of the air quality standards. EPA guidance has required contingency measures to be real, permanent, quantifiable, and enforceable. However, this requirement limits the types of measures that could be considered as contingency. The Subcommittee discussed contingency measures in transitional areas and options for improving the current definition of contingency measures. The Subcommittee generally agreed that contingency measures need to be adopted when the control strategy plan is first developed, so they can be implemented quickly when an area fails to make reasonable further progress. Subcommittee members also agreed that, under certain conditions, episodic measures and planning requirements could be part of an area's contingency plan. Consensus was not reached on the use of voluntary measures as contingency measures.

The Current Approach to Contingency Measures

The CAA requires the inclusion of contingency measures in implementation and maintenance plans of a SIP. Contingency measures fill two purposes in a SIP program:

- Assist nonattainment areas in meeting RFP requirements or attaining the air quality standard by a specific date.

- Promptly correct a violation of the air quality standard after attaining the standard in a maintenance area.

The general contingency measure provisions in the CAA (i.e., subpart 1) apply to all SIPs. Other contingency provisions (i.e., subpart 2) apply to current ozone nonattainment areas under the 1-hour standard. The ozone provisions are very specific as to the attainment dates and rate of progress to be achieved under the control strategy plans for ozone nonattainment areas, but the CAA does not specify how many contingency measures are needed or the magnitude of emission reductions to be provided by these measures. The general preamble for the implementation of title I of the CAA Amendments of 1990 (57 FR 13498) provides the necessary specificity to enable areas to develop approvable plans with appropriate contingency measures. According to the general preamble, contingency measures are required to ensure, at a minimum, that an

appropriate level of emissions reduction progress would continue to be made if a reasonable further progress milestone is not achieved. Under the worst case scenario, if there is a complete failure to achieve reasonable further progress (i.e., 3 percent per year), then the contingency measures need to be sufficient to make up the entire increment. In the more likely case of only partial failure, the State could select from a slate of contingency measures those measures which would make up the shortfall. EPA guidance requires these contingency measures to be real, permanent, quantifiable, and enforceable. Some ozone nonattainment areas have found that all the available measures that satisfy this requirement have been used in implementing the core measures of the SIP. Thus, these areas are left with potential measures that are not approvable as contingency measures for a SIP.

Contingency Measure Principles for Transitional Areas

The EPA Administrator will make nonattainment designations in the year 2000 for areas not meeting the new ozone air quality standard. The Presidential Directive on implementation of the new standards makes available a new transitional classification for areas attaining the 1-hour ozone standard by 2000 but not meeting the new standard, as long as States agree to submit control strategy plans by 2000 and/or have the ability to rely on regional measures to bring about early attainment of the 8-hour ozone standard.

There will be three different scenarios under which areas qualify for the transitional classification:

1. Areas show attainment solely from the emission reductions achieved through implementation of the regional transport strategy.

2. Areas must rely on a combination of local measures and the regional transport strategy.

3. Areas achieve minimal or no benefit from the regional transport strategy and must rely solely on local measures.

The advantages of the transitional classification include minimal planning requirements, streamlined attainment demonstrations, minimal revisions required for existing transportation conformity and new source review programs, and opportunity to rely on regional measures for the necessary emission reductions. For areas able to attain the new 8-hour ozone air quality standard based on regional measures alone, the simplified planning process is an advantage that probably makes up for the difficulties of having to plan 3 years early.

The transitional classification carries with it requirements and deadlines consistent with the schedule for OTAG States — implementation of emission reduction measures by 2004 and assessment of the effectiveness of the measures by 2007. There are four circumstances under which a transitional area could fail to meet its deadlines. The BPAPWG discussed possible options to remedy such failure but did not have time to explore the full range of options. Some possible remedies are presented below, but should not be construed as necessarily the best remedies:

1. EPA failed to implement national measures in a timely manner and States were relying on the emission reductions to meet reasonable further progress requirements.

   Possible remedy: EPA implements preadopted national contingency measures.

2. EPA implemented the national measures, but these measures failed to achieve the projected emission reduction or air quality benefit.

   Possible remedy: EPA implements preadopted national contingency measures.

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3. The State failed to implement measures that were part of its control strategy plan or the regional strategy in a timely manner.

   Possible consequence: Sanctions or preadopted Federal Implementation Plan (FIP) goes into effect.

4. The State/local measures failed to achieve the projected emission reduction or air quality benefit.

   Possible remedy: State implements preadopted contingency measures.

A New Approach to Contingency Measures

The Subcommittee discussed characteristics of contingency measures under the new standards. This discussion was based on the premise that areas violating the standard need to make real, quantifiable progress toward attainment, with the goal of meeting the statutory attainment deadlines in the CAA. Therefore, the contingency measures identified in the control strategy must be true "backstops," ensuring timely attainment of the air quality standard by achieving quantifiable emission reductions.

Proposed Characteristics of Contingency Measures

Episodic Measures

Episodic measures should be allowed as contingency measures to the extent that emission reductions are quantifiable and the measures satisfy the restrictions of 40 CFR Part 51 (requirements for preparation, adoption, and submittal of implementation plans which restrict the use of episodic measures). Subcommittee members generally agreed that, in order to be considered as contingency measures, episodic measures should be part of a full seasonal effort to reduce emissions.

Voluntary Measures

Some Subcommittee members agreed that, under certain conditions, voluntary measures should be given consideration as contingency measures. Voluntary measures would be used as the contingency measures of last resort (i.e., all identifiable and feasible mandatory measures have been implemented) and would initially receive less emission reduction credit than enforceable measures. Additionally, in order for a voluntary measure to be accepted as a contingency measure, once implemented, there must be an ongoing analysis of its actual emission reductions. Determination of initial credit must be conservative so as not to overestimate the actual emission reduction benefit or air quality improvement. More credit should be given retrospectively after such measures have "proven" their emission reductions. As a means of increasing the initial available credit, States are encouraged to implement voluntary measures early (i.e., before contingency measure requirements are triggered).

Several Subcommittee members objected to the use of voluntary measures as contingency measures in any circumstance. They argued that contingency measures should only include measures which provide certain, credible, and enforceable reductions, and that "last resort" measures often become "first resort" measures based on political popularity.

There should be a distinction made between voluntary measures that are part of an economic incentive program and those measures that are strictly voluntary. If there is an "enforceable" incentive (e.g., economic incentive, time or convenience incentive, etc.), then more initial emission reduction credit could be granted.

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Time Frame for Adoption	Contingency measures need to be adopted when the SIP is first developed, so they can be implemented quickly (i.e., within 1 year) once it is determined that an area has failed to make reasonable further progress.
Required Emission Reduction/ Air Quality Improvements	Contingency measures must be able to keep the nonattainment area on track toward attainment. There must be sufficient collective credit from the menu of contingency measures to replicate the entirety of emission reductions needed to achieve timely progress and attainment. In the case of voluntary contingency measures, more than one year's worth of emission reductions would be required in order to account for the inherent uncertainty.
Substitution of Measures	As the state of knowledge increases as to the emission sources which primarily contribute to the nonattainment problem, it may be determined that contingency measures, other than the ones initially adopted in the SIP, would be more effective in achieving reasonable further progress and timely attainment of a new air quality standard. Therefore, there should be an opportunity to substitute contingency measures. An assured opportunity for substitution may relieve some of the anxiety associated with having to identify "up-front" contingency measures in the SIP. Substitution of measures would only apply to contingency measures and would not involve any core SIP measures. Further, substitution would not be appropriate when the measure being eliminated would contribute to faster correction of the shortfall or faster attainment if retained along with the substituted measure.
Measures for Areas Unable to Demonstrate Attainment	SIPs for these areas must still include contingency measures. Cost-effectiveness benchmarks may be used in order to draw the line between core SIP measures and contingency measures. Substitution of contingency measures should be available for these areas as discussed above. However, an area cannot have its control strategy plan approved under Subpart I unless the plan demonstrates attainment of the air quality standard. Some Subcommittee members strongly opposed setting up a category for areas unable to demonstrate attainment of an air quality standard. The CAA does not allow for this. Therefore, it is not appropriate to discuss contingency measures for areas that cannot show attainment.
Planning Requirements as "Contingency Measures"	A commitment to adopt additional measures can be part of a contingency plan, even though it is not by itself sufficient. Using planning requirements alone as contingency measures would go against the principle of having enforceable, quantifiable reductions in the SIP to ensure the rate of progress. This principle would not preclude a mid-course reassessment and substitution of other measures.

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Highlights of the Subcommittee's Discussion

The "Implementation Strategies for Contingency Measures" issue paper was discussed at the June and October 1997 Subcommittee meetings. The Subcommittee initially assumed that contingency measures for the new air quality standards would be the more costly of the technically feasible control measures identified during the SIP development process. Several Subcommittee members disagreed with this assumption, indicating there would be circumstances in which all technically feasible control measures would be implemented as core measures. This would leave less certain control measures, such as episodic and voluntary measures, as contingency measures. The Subcommittee generally agreed that episodic measures could be used as long as these measure were seasonal in nature, although there were still concerns regarding the uncertainty of such measures.

There was support for the possible use of voluntary measures as contingency measures, since some areas may only have these types of measures available. These members believed that voluntary measures should not be excluded from consideration. Other Subcommittee members did not support the use of voluntary measures, since they would not satisfy the CAA requirement of enforceability and quantifiability of control measures. There was general agreement that substitution of adopted contingency measures would be allowed as long as it would not result in the removal of stricter measures. The Subcommittee expressed interest in the concept of national contingency measures. However, there were reservations that EPA would not be able to adopt such measures in a timely fashion.

3.24 Rewards And Sanctions

States and Tribes are responsible for developing long-range plans for ensuring air quality that protects human health and the environment. EPA sets national standards for air quality and periodically reviews the standards. EPA also establishes requirements for improving visibility in national parks and wilderness areas. When the standards or other air quality requirements change, how can EPA encourage States and Tribes to speed up the planning process? How can States, Tribes, and EPA encourage sources of air pollutant emissions to reduce emissions faster? The Subcommittee identified the issues that are important to address when developing incentives for early planning and emissions reductions. The Subcommittee did not reach consensus on new incentives.

General Principles

The Subcommittee studied ways to reward States and Tribes for earlier development and implementation of air quality plans and to impose sanctions when they miss deadlines. The Subcommittee also studied ways to reward the sources of air pollutant emissions for voluntarily reducing emissions faster than required. Although the Subcommittee did not reach consensus on new rewards and sanctions, they did discuss general principles for developing incentives. The principles which they considered are as follows:

- No proposal should make any situation any worse.
- Positive incentives should encourage early compliance, meaning that regulators should not be rewarded for merely meeting deadlines.
- Sanctions should apply immediately, "fit the crime," and be consistently applied.
- EPA should strictly follow uniform criteria for approving air quality plans, ensuring that the criteria do not become weaker for areas which submit plans later in the planning cycle.

Turning Existing Tools Into New Opportunities

Regulators use a variety of tools to reduce emissions or reduce unnecessary costs to business. The owner of a new plant in an

area with longstanding air quality problems must "offset" the planned emissions from the factory by paying another factory in the area to reduce emissions. Certain plants in these areas must install reasonably available control technology (RACT) to reduce the emissions that help create ground-level ozone. Regulators can grant variances, which allow plants to meet less stringent requirements. Regulators may start an emission trading program and allow emission sources to "bank" (save) excess emission reductions for use or sale in the future. As shown in the list on this page, these and other tools have the potential to be used in new ways to create the desired incentives.

Issues to Consider When Developing Incentives for Early Planning and Emissions

Issue	Options
How can regulators be encouraged to plan and implement plans early?	1. Reduced offset ratios for new sources. 2. Additional offset credits for the pool of credits obtained from shutdowns, penalties, and other sources. 3. Flexible response. Currently, a State which has been redesignated to attainment and then experiences violations of the standard must implement a contingency plan which includes automatic measures. "Flexible attainment regions" have additional time to "cure" the violation in a more flexible manner. States which meet early compliance requirements could be granted a similar flexibility in meeting their emissions reductions requirements. 4. Set-aside of Federal highway moneys for projects which improve air quality. 5. Significant public recognition.
How can regulators be discouraged from missing deadlines?	1. Accelerated future deadlines for planning bodies. 2. Lower RACT thresholds. 3. Denial of variances. 4 Discounted emission reduction credits when they are banked, i.e., saved for future use or sale. 5. Additional requirements for State agencies.
How can sources of emissions be encouraged to reduce emissions early?	1. Limited exemptions from future regulation. 2. Well-designed, incentive-based regulations for implementing national air quality standards.
What are the minimum requirements to qualify for positive incentives?	The Subcommittee did not develop options for the resolution of this issue.
What would happen if all existing sources of emissions in an area qualify for incentives to reduce emissions early, but additional controls are needed to attain the national air quality standards?	The Subcommittee did not develop options for the resolution of this issue.
Should emission reductions resulting from national programs (for example, mobile source emission reductions) count toward the Federal progress requirements only if States meet deadlines?	The Subcommittee did not develop options for the resolution of this issue.

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Highlights of the Subcommittee's Discussion

The Subcommittee discussed the "Rewards and Sanctions" issue paper at the February 1997 Subcommittee meeting. The Subcommittee's discussion of the issue paper covered the need for an elaborate system of rewards beyond well-designed economic incentives, the efficacy of several existing Federal programs to promote early emission reductions, the importance of expanding the paper to include incentives for early planning by States, holding the EPA accountable for timely preparation of guidance documents, the criteria for giving rewards, and existing disincentives for early State planning. Among those comments, the following appear to have had the greatest potential significance for the issue paper. First, economic incentives, in particular emission fees and emission trading programs, provide the proper incentives for early emission reductions. "The best incentive," one member said, "is to stop allowing emissions to be released for free." Second, incentives for early reductions should not apply to areas where air quality violates a national air quality standard and will continue to violate the standard. Furthermore, rewards must be for "significant reductions, not just run-of-the-mill reductions." Third, a large disincentive to early planning exists because, under EPA's current system for approving States' air quality plans, "it makes sense to wait [to submit a plan] since the deals get better later in the planning cycle."

Since preparation of "Rewards and Sanctions," the Economics Advisory Group resumed discussion of incentives for early emission reductions in another issue paper, "Using Economic Incentives to Achieve Air Quality Objectives."

3.25 Measures Affecting Cars, Trucks, Buses, and Other Vehicles

This summary corresponds to the "General Mobile Source Measures" issue paper. Cars, trucks, buses, locomotives, boats and ships, and aircraft emit air pollutants that create ozone and PM-2.5. In July 1997, EPA established new air quality standards for these pollutants. Reducing the air pollutants from vehicles will aid the areas that need to take action to comply with the new standards. The Subcommittee discussed the issues that are important to address when revising the major Federal programs that affect emissions from cars, trucks, buses, and other vehicles but did not discuss recommendations for these programs. The Subcommittee deferred development of recommendations for these issues to two other FACA Subcommittees, the Mobile Source Technical Review Subcommittee and the Linking Transportation, Energy, and Air Quality Concerns Subcommittee.

Emissions from Cars, Trucks, Buses, and Other Vehicles

Every time someone drives to the store, carries freight, goes water skiing, flies, or makes just about any other kind of trip, pollution is put into the air. Gasoline and diesel fuels power 99 percent of the country's motor fleet. Pollution comes from engine exhaust, from tires and brake linings as they are worn down, and from fuel as it evaporates from fuel tanks, gas lines, and engines. The total quantity of air pollution from any one vehicle depends on the type of engine in the vehicle, its emissions control equipment, the age of the vehicle, the fuel, use of the vehicle, and vehicle maintenance.

The CAA sets emission standards for new cars, trucks, and buses, and standards for gasoline and diesel fuels. The CAA also requires the EPA to set requirements for "inspection and maintenance" programs which help ensure that the emissions control equipment in gasoline-fueled cars and trucks operates properly.

The typical new car sold today emits fewer pollutants per mile than new cars sold 20

years ago. Nonetheless, because of increased driving, total air pollutant emissions from cars have not decreased by the same proportion. Current projections—which include current CAA programs but no new technical improvement—show that emissions from vehicles will continue to decrease until 2010, after which emissions are projected to increase.

CAA Limits Changes in Programs

The CAA prescribes emission standards for new motor vehicles and fuel standards. Over the next decade, in response to the CAA's mandates, the EPA will consider new national measures to reduce exhaust emissions from cars, trucks, and buses. The CAA sets forth guidelines for the stringency and timing of implementation of these measures.

Emission Equipment Testing and Repair Programs

Car owners in areas with long-term air quality problems must periodically have mechanics test the catalytic converter and other components of the vehicle's emission control system. If the equipment is not working, the owner must make repairs, although regulations exempt owners from the most expensive repairs.

New engine technology and devices for measuring emissions may allow regulators to make dramatic changes in emission equipment testing and repair programs. Beginning with the 1994 model year, cars and light-duty trucks automatically detect malfunction and deterioration of emission-related equipment with onboard diagnostics. Remote sensing devices can measure emissions from moving vehicles. Onboard diagnostics may play a growing role in monitoring vehicles for emission-related problems and may eventually replace tailpipe testing for vehicles so equipped. Remote sensing devices can supplement an area's emission equipment repair program by identifying problem vehicles before their next scheduled emission test.

The Subcommittee discussed the following issues.

- Should larger trucks be subject to emission equipment testing and repair programs?
- Are onboard diagnostics a replacement for existing emission testing programs for newer cars? How can air quality regulators ensure that cars with unacceptable emissions are repaired?
- What is the appropriate approach to emission testing and repair programs for older cars, which owners are gradually retiring and replacing with cars having onboard diagnostics?

Fuel Standards

The CAA sets standards for cleaner fuels. One program places limitations on the volatility of gasoline, setting standards for the maximum Reid Vapor Pressure to reduce ozone formation. Another program requires additional modifications in gasoline composition. Federal reformulated gasoline reduces emissions of ozone-forming and cancer-causing pollutants. The CAA prescribes the areas which must sell gasoline with reduced Reid Vapor Pressure or Federal reformulated gasoline, but the statute restricts the sale of cleaner gasoline in many areas.

The Subcommittee discussed the following issues.

- Should States be allowed to reduce the Reid Vapor Pressure of gasoline sold in areas which have acceptable air quality but contribute to pollution problems downwind?
- Should additional areas be required to use Federal reformulated gasoline as an emissions control measure?
- Should new nonattainment areas have the opportunity to use Federal reformu-

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lated gasoline as an ozone control measure?

- Should States have an opportunity to require sale of Federal reformulated gasoline in areas which have acceptable air quality but contribute to pollution problems downwind?

Highlights of the Subcommittee's Discussion

The Subcommittee discussed this issue paper at the April 1997 Subcommittee meeting. The Subcommittee did not address or develop options for resolving the issues pertaining to emission equipment testing and repair programs or fuel standards. The Subcommittee deferred development of recommendations for these issues to two other FACA Subcommittees, the Mobile Source Technical Review Subcommittee and the Linking Transportation, Energy, and Air Quality Concerns Subcommittee. The Subcommittee's Economics Advisory Group developed two case studies exploring how incentive-based programs could apply to highway heavy-duty diesel engines and the gasoline engines in lawn and garden equipment. The case studies appear in the issue paper "Using Economic Incentives to Achieve Air Quality Objectives."

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CHAPTER

4

Scientific Support for the Development of Implementation Strategies

The following are discussions developed by the STSWG, which offer:

- a framework for understanding the complex scientific and technical issues associated with the revision of the ozone and particulate matter (PM) NAAQS and the regional haze rule; and
- STSWG responses to work group questions on integration and geographic scales and STSWG comments on the area of violation/area of influence issue paper.

The framework establishes the current understanding of the present environmental condition, describes how that condition has evolved, identifies tools to address the current state, and addresses regional transport of pollutants. This chapter contains commentary developed by the STSWG as a result of inquiries from other FACA workgroups on the technical basis underlying integration of the regulatory programs for ozone, PM, and regional haze, geographic scales required for air quality management, and comments on the area of influence/area of violation issue paper.

4.1 Framework Overview

Emerging air quality management control policies for ozone, PM, and regional haze programs rely on technical information and scientific knowledge gleaned from diverse sources and stakeholders. An increasing amount of interaction among a diverse community of air quality professionals accompanies any effort toward integrating programs across pollutants and over wide geographic regions. Compounding the differences among programs and specialties is the nearly concurrent implementation of ozone, PM, and regional haze programs which is the overriding motivation to understand similarities and overlaps in order to optimize technical resources and identify windows of opportunity for successful integrated air quality management. The objective of the STSWG was to establish a common reference frame for the technical information and methodologies underpinning the implementation of the programs.

The Need for a Conceptual Model

In order to develop an adequate understanding of the formation of ozone, PM, and regional haze in different areas of the country, it is useful to develop conceptual models of the relevant processes that lead to the formation of each. Further, it is useful to develop a conceptual model of how monitoring networks, data analyses, emissions inventories, modeling analyses, and environmental assessment studies can be used to develop and implement meaningful and effective control programs. In forming the conceptual model, one typically encounters many more questions than available scientific and technical information to answer them. Thus, the conceptual model should be viewed as a "work in progress," which will be constantly evolving as new and better scientific information becomes available, is validated, and then implemented in air quality management programs across the United States.

The conceptual model coupled with such a feedback mechanism provides the basis with which to identify additional needed information and to verify our understanding of evolving atmospheric conditions and responses to control strategies. While feedback mechanisms enable us to evaluate the effectiveness of the control programs implemented, they are also useful for establishing research agendas. They will also identify the assumptions that are necessary to formulate and iteratively apply computational models within a time frame shorter than that needed to advance fundamental scientific knowledge. The entire process of creating conceptual models is iterative in nature, but provides an

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overall framework for increasing the scientific and technical information needed to provide a basis for sound air quality planning and management. In addition, conceptual models can codify the processes independent of any air quality modeling, and thus provide an independent mechanism to evaluate the performance of such computational air quality tool(s).

The Formulation of a Conceptual Model

In formulating the conceptual model, the STSWG accepted the following foundational principles: (1) in the environment there are pollutants that are harmful to human health and welfare; (2) in the specific cases of ozone, PM, and regional haze, there is scientific evidence that these are pollutants that have effects on human health and overall environmental welfare; (3) there is a need to reduce the concentration of these pollutants to acceptable levels as codified in the ambient air quality standards (e.g., NAAQS and the national Class I visibility goal); (4) compliance with these NAAQS and other air quality goals is testable using ambient measurement data; (5) human and civilized activities do influence or even create the harmful levels of these pollutants; (6) human activities will need to be modified in order to reach safe levels of these pollutants in the ambient atmosphere; (7) some form of regulation will be necessary to achieve this modification of human activities; and, (8) ambient levels of these pollutants need to be maintained at or below specific air quality standards (i.e., NAAQS), but that the levels and forms of these standards are outside the scope of this work group's activities.

While there are specific emission sources, transport phenomena, and transformation processes unique to ozone, particulate matter, and regional haze, there also are common processes that link the three. That is, ozone, PM-2.5 and regional haze have a sufficiently common origin such that it makes sense to define atmospheric and emissions data which suggests an integrated set of modified human activities, if any, that will achieve the necessary reductions and maintenance of ambient concentrations of these pollutants at or below the current NAAQS. Toward these ends, the STSWG has prepared two technical documents. The first, *The Integration of Ozone, Fine Particles, and Regional Haze Air Quality Management - Technical Discussion*, July 26, 1996, provides an introduction to the state-of-the-science pertaining to integrated pollutant implementation. The second, *Conceptual Model for Ozone Particulate Matter and Regional Haze*, provides a more rigorous treatment of the state-of-the-science and is organized by the following topics:

- Existing environmental state (through summaries of measured ambient air quality data),
- Physical/chemical processes which characterize air quality, and
- Scope of monitoring, modeling/ analysis, and emission inventory programs to characterize and predict air quality phenomena.

The draft of the *Conceptual Model for Ozone Particulate Matter and Regional Haze* provided by the STSWG contains chapters on the following:

- The Current Environmental State
- Processes: How the State is Created, Sustained and Maintained
- Current Tools to Address and Implement the Current State of Knowledge
- Time-Distance Considerations Relevant to Transport and Regions of Influence
- Current Needs Based on Relevant Issues and Identified Information
- Integration of Numerical Models and Ambient Monitoring Data for Effective Air Quality Management

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- Developing a Working and Responsive Science-Policy Continuum.

It is through the compilation of these chapters that the STSWG attempted to form a conceptual framework for the understanding of the pertinent scientific issues surrounding the revision of the ozone and PM NAAQS and the regional haze rule. The EPA shall complete the conceptual model by adding an additional chapter and two companion appendices that will summarize the state-of-science on ozone and PM air quality modeling prepared by the North American Research Strategy for Troposheric Ozone (NARSTO) and the American Petroleum Institute. The STSWG has approved the text of this chapter and inclusion of these appendices in the conceptual model report. The EPA will be responsible for the distribution of the completed conceptual model report.

4.2 Responses of the STSWG to Other FACA Work Group Questions

Other FACA workgroups have asked questions regarding the technical basis and issues underlying the integration of regulatory programs for ozone, PM, and regional haze, and the specification of geographic scales required for air quality management.

Technical Basis and Considerations for Integrating Ozone, Particulate Matter, and Regional Haze Implementation Programs

Regarding the rationality of integration, the initial response of the STSWG is a qualified "yes," given the regionality, spatial patterns of air quality indices, precursors, sources, atmospheric chemistry and meteorological processes which affect more than one pollutant, and control options. The technical and scientific rationale underlying the integration of ozone, PM, and regional haze air quality management practices is based on a mix of empirical observations, atmospheric processes, and practical administrative concerns. While this discussion focuses on common attributes across pollutant groups, it is important to recognize and distinguish those attributes where there is little linkage. Many examples and inferences presented here tend to reflect what is known about Eastern United States air quality issues (*e.g.*, ozone), with possibly little relation to Western United States phenomena. At the risk of generalizing air quality descriptions for illustrative purposes, recognition that a simplified approach cannot operate effectively everywhere must be retained. The discussion focuses on the relationships between ozone and PM, with the implicit assumption that PM (particularly PM-2.5) levels and chemical composition directly relate to regional visibility impairment, given the strong relationship between the constituents of PM and the manmade portion of visibility impairment. Regional haze is a widespread impairment of visibility in every direction, mostly attributed to light scattering from fine particles. Even though much of the following discussion is highly technical, the primary assertions will be fairly evident, i.e., :

- Understanding the emission sources and atmospheric processes which are responsible for elevated air pollutant levels requires an examination of urban and regional geographical scales;
- Ozone and PM-2.5 concentrations may exhibit similar spatial patterns, although the frequency (and importance) of co-occurring patterns is not well understood;
- Many of the emission precursors (and sources of precursors) to ozone, secondarily formed PM-2.5, and regional haze are the same;
- Many of the atmospheric processes (chemistry and meteorology) affecting ozone, PM-2.5, and regional haze are interrelated; and
- Several critically important information gaps exist which create very difficult challenges for air quality management of these pollutants.

Empirical Evidence for Integration

Ozone and PM-10 (particles 10.0 microns [μ] in diameter) concentrations in the Eastern United States can exhibit similar spatial patterns during summertime ozone episodes.

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Analysis of the available particulate data consistently indicates that PM-fine (particles 2.5μ in diameter) constitutes the majority mass fraction of PM-10 in the summertime East. In combination, these observations qualitatively imply co-occurrence of elevated ozone and PM-2.5. However, quantification of the similarity and frequency (very common or quite unusual) of such events is severely restricted by the lack of a PM-2.5 database in the East, as well as the fact that elevated PM-2.5 concentrations can occur without elevated ozone. Where data exist in certain western locations, the episodic relationships between ozone and PM appear to be very complex. For example, a major component of the PM-2.5 problem in Los Angeles (as well as the San Joaquin Valley, Salt Lake City, and Denver) is wintertime formation of ammonium nitrate, which is not stable at the high temperatures associated with elevated ozone. Nevertheless, smog events in Los Angeles almost always are accompanied by impaired visibility, and visibility is directly associated with PM-2.5 levels. In both the East and the West, high levels of PM-2.5 can impair visibility when high ozone concentrations are not observed. This evidence notwithstanding, other considerations (as described below) provide a strong rationale for integration across ozone, PM, and regional haze control programs.

Emissions and Atmospheric Process Linkages Across Ozone, Fine Particles, and Regional Haze

Several connections exist among the three pollutant categories. The linkages are based on the existence of common emission precursors, source categories, and atmospheric chemical and meteorological processes that affect more than one pollutant. For example, emissions of NO_x potentially can lead to both ozone and PM-2.5 formation. A combustion source often emits both sulfur dioxide (SO_2), a PM-2.5 precursor, and NO_x. The sequence of atmospheric chemistry reactions underlying ozone formation is in part responsible for PM-2.5 formation. Similar meteorological processes affect the movement, mixing, and removal of ozone, PM-2.5, and their precursors. Some of these connections are complicated and explained more completely in the forthcoming *Conceptual Model for Ozone Particulate Matter and Regional Haze*. The following are very brief, technical descriptions of the connections across pollutant categories provided for those interested in more detail.

1. Common "Direct" Precursor Emissions

Emissions of NO_x, VOC, and carbon monoxide (CO) are considered precursors for ozone formation. NO_x, VOC, and sulfur (SO_x, mostly as SO_2) emissions also can lead to PM-2.5 formation through "secondary" atmospheric chemistry reactions. Both ozone and a substantial fraction of PM-2.5, which can vary greatly with season and location, are the result of secondary formation processes. The major components of secondary PM-2.5 also are highly variant. They include sulfates, carbon (elemental and organic), and nitrates. The fraction of PM-2.5 due to secondary processes is highly variant in space and time. Under certain conditions (e.g., available NH_3, negligible sulfate, low temperatures), NO_x emissions can lead to PM-2.5 ammonium nitrate formation. Several directly emitted organic compounds contribute to PM-2.5 organic aerosols. These organic compounds may contribute as "primary" organic aerosols; that is, they almost immediately condense to the aerosol phase during the emissions process or shortly downstream. However, certain VOC, (e.g., toluene) which exist as gases under most conditions, can undergo atmospheric reactions and transform into condensable "secondary" organic aerosols. Thus, a VOC like toluene can contribute to either ozone or PM-2.5 formation as a precursor emission.

2. Common Source Categories

Based on the multiple roles of precursors, a particular source of (natural or anthropogenic) emissions of

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one precursor (*e.g.*, NO_x or VOC) can affect both ozone and PM-2.5. On the other hand, a single source emitting multiple precursors (*e.g.*, combustion process releasing NO_x, VOC, CO, and SO_x) could affect one pollutant category only. In this case, the need for integration is not driven by atmospheric chemistry linkages. This commonality among sources suggests a need for consistent approaches in estimating emissions of multiple precursors within a specific source category. For instance, a consistent approach needs to be applied for estimating and projecting both NO_x and SO_x emissions from a combustion source.

3. Interaction of Atmospheric Chemistry Reaction Cycles and "Indirect" Precursors

Much of the general atmospheric chemistry involved in ozone formation can affect PM-2.5 formation, as alluded to above, in certain instances. For example, ozone is the major initiator of chemical intermediates (hydroxyl radicals) that convert SO_2 and NO_2 to particulate sulfate and nitrate. Clearly, a linkage between ozone and PM-2.5 exists through the role of ozone in generating these chemical intermediates. Therefore, even in this case, integration is still an important consideration. Note that this linkage between ozone and PM-2.5 is at the process level and does not require coexisting "high" ozone and PM-2.5 levels. Many other important linkages involving oxidizing chemical species (radicals and peroxides) exist within the NO_x, VOC, SO_x, ozone chemistry system. A better characterization of the basic ozone chemistry and the associated linkages among the precursors is needed to predict the effect of changing emissions on air quality indices. Consequently, the predictive air quality models used to assess ozone and PM-2.5 impacts should include a basic core set of atmospheric chemistry reactions (*e.g.*, a gas phase ozone chemistry mechanism).

Because of their common atmospheric chemistry linkages, many precursors associated with one pollutant might be considered as an "indirect" precursor for another pollutant as well. Virtually all precursor emissions (*e.g.*, NO_x, SO_2, VOC, and CO) participate in the general cycling of various chemical intermediate species. In this general context, the emission precursor may only share in certain atmospheric chemistry processes without leading to increases in a secondary pollutant. For example, NO_x, which affects the chemical intermediates that convert SO_2 to sulfate, could act temporarily as an inhibitor of sulfate particle formation. Similarly, reductions of one precursor emissions may lead to reductions in one secondary species that are compensated by increases in other secondary species. The majority of VOC species that do not transform into organic aerosols could nevertheless be PM-2.5 precursors through their general role in atmospheric chemistry. This universal pool of precursors makes it difficult to assess the effect that reduction of any specific precursor emissions has on secondary pollutant formation.

Many other relationships with similarly unknown degrees of effect exist. Thus, integrated implementation is far from a straightforward exercise. Complex air quality simulation models, in combination with simpler models and receptor/observational methods that include approximations of these process linkages, will need to be exercised to account for the multiple nonlinearities and positive and negative feedbacks. This complexity demands high-quality emission inventories, technically credible models, and spatially and temporally representative monitoring and meteorological data for use in predicting pollutant concentrations and the air quality benefit of control strategies.

Integrating Control Strategy Development through an Air Quality Modeling Approach

The real benefit of integration is the prospect of a more systematic, efficient, and compre-

hensive treatment of emission inventories, episode selection, and atmospheric physics and chemistry that might empower the air quality manager to characterize source to receptor effects in an orderly way. Given the complex mechanisms for and linkages between ozone and PM-2.5 formation, the formulation of control strategies should acknowledge the need to optimize both environmental benefits and control options. The addition of data on the costs and effectiveness of control options would enable the air quality manager to identify the cost-effective means for attaining a variety of air quality goals.

To this end, emission inventories underlying most current ozone modeling efforts include most of the sources for aerosol formation, but not necessarily the aerosol specific emissions such as organic aerosols from motor vehicles. Other notable exceptions are the emission of fugitive primary particle sources and most sources of ammonia emissions. The result of the integration could be to produce estimates of the residual aerosol and regional haze related air quality benefits from an ozone precursor control perspective. (Additional analysis directed at the specific needs for meeting PM-2.5, and visibility concerns would follow this ozone oriented approach. Ideally, an objective and likely iterative ability to assess the benefits and tradeoffs associated with managing all three pollutant categories would evolve.) Although this example does not represent full integration given the unidirectional information flow (ozone to particles), it does acknowledge similarities among programs and avoids mistakes and inefficiencies incurred from independent analyses. Aside from any direct regulatory policy, the linkages across pollutants and emissions are reasons in and of themselves for planning for more efficient development and use of emissions, air quality models, and monitoring networks which address sometimes confounding problems encountered while assessing multiple pollutants and their related health/welfare effects and control options.

Distinctions Among Ozone, Fine Particles, and Regional Haze

Coincident ozone and PM-2.5 episodes can occur given similarities in the meteorological and atmospheric chemistry processes underlying ozone and PM-2.5 formation, maintenance, and destruction. However, as discussed above, non-coincident events may occur more frequently. For example, several basic atmospheric chemistry reactions involved in ozone and PM-2.5 formation occur whether or not high ozone and PM-2.5 levels are generated in the atmosphere. Nevertheless, several distinctions among the pollutants persist. These differences include the contribution of primary emissions to total PM (especially PM-10) and non-summertime PM-2.5 events. Some primary particles are generated by strong wind conditions (e.g., soil, geologic material) and other mechanical processes (e.g., roadway fugitives). The fraction of primary PM peaks in summer in most of the western third of the country where there is little precipitation for 6 to 8 months per year, leading to dry, windy conditions for the generation and movement of geologic materials. As discussed earlier, ammonium nitrate, a significant PM-2.5 component in the West, is unstable at relatively high temperatures and therefore does not form in significant amounts during the summer. Meteorological effects that influence the creation, maintenance, or removal of high levels of ozone and PM-2.5 may be significantly different among pollutants, regions of the country, and times of the year. Other specific emissions-driven events such as forest burning and wintertime wood smoke (a major wintertime source of urban PM) bear virtually no relation to ozone. Many of these PM episodes can be dominated by either primary or secondary PM-2.5 components, or by primary anthropogenic coarse PM emissions. Research exploring the frequency and characterization of co-episodic and uni-episodic events would yield further insight into underlying causes of events and provide direction for integrated implementation opportunities.

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Generally, PM-10 is not considered in the integration discussions of ozone, PM, and regional haze. This is because the coarse fraction (i.e., greater than 2.5 μ) typically is derived from primary emissions such as fugitives and geologic material with little association to ozone from a process, or episodic, perspective. In addition, visibility impairment leading to regional haze is overwhelmingly associated with the PM-2.5 fraction of PM-10.

Major Technical Issues

The principal technical issues associated with integrated air quality management involve the adequacy of databases (including ambient, emissions, and meteorological) and models, including specific process formulations, on which to base credible assessments. This is particularly true given the statistical form of the NAAQS and the anticipated overlapping domain of contributing sources. While it is impossible to ascribe consensus opinion regarding clear acceptable limits on the available information, gradations of acceptability or comfort level can be associated with various pollutants. Generally, the tools (ambient data, models, and emissions) underlying ozone analyses are far more mature than those for PM-2.5. Major efforts in chemical mechanism development, ambient monitoring methods, and establishment of national and special study efforts for monitoring, emissions, and modeling have resulted in a wealth of information and familiarity with these tools. This relative abundance of knowledge for ozone should not be construed as a science lacking uncertainty, as significant technical issues remain (e.g., the current NARSTO effort), and even more are yet to be defined. A sampling of these issues includes the representativeness of emission inventories, particularly biogenic emissions; uncertainties in the modeling system (chemical characterizations of aromatics and biogenics, treatment of vertical mixing processes); difficulties in monitoring techniques (carbonyls, NO_x, NO_2, polar VOC); and lack of measurements (total reactive nitrogen, NO_x upper air data). Our ability to perform highly credible ozone analyses and to ascribe confidence levels in our results depends on our ability to address these technically complex issues.

Visibility protection presents several additional considerations beyond the scope of topics covered under ozone and PM-2.5. First, PM-2.5 concentrations that are far below a NAAQS can affect adversely visibility in a significant manner. For this reason, visibility management will need to consider both the protection of "clean" days and highly impaired days. The meteorology and emissions characteristics during clean days differs from those common during high pollution episodes. Second, relative humidity plays a significant role in enhancing visibility impairment. In humid conditions, particularly above 70% relative humidity, sulfates, nitrates, and certain organics readily take on water and expand to sizes that are greater contributors to visibility impairment. Therefore, different PM-2.5 species will affect visibility to different degrees. Third, unlike the NAAQS approach of setting a national standard, the visibility program under section 169A of the CAA has as its goal "the prevention of future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which results from manmade air pollution." States are required to make "reasonable progress" toward this goal. The notion of background versus manmade air pollution raises several technical and policy challenges, e.g., with the characterization of "natural" conditions (particularly regarding wildland fire emissions).

Consideration of PM-2.5 and regional haze presents several additional issues, resulting from: 1) a very complex multiphase, multicomponent, multiseason aerosol system, 2) the complex covariance of these data; and 3) the previous PM-10 form of the NAAQS, which has resulted in few regulatory pressures to drive an improved characterization. Significant concerns include: major positive and negative measurement artifacts

related to gas-particle phase changes; a simple lack of speciated ambient data, especially urban PM-2.5 measurements; poor quality assurance/control of ambient sampler data; emissions data with poor general spatial applicability; very limited availability and nearly nonexistent application and evaluation of regionally-accurate air quality models; and highly empirical treatment of organic aerosols within the available models. These gaps are interconnected in the sense that quality model evaluation and improvement rely on available quality measurements. The issue is further complicated by complexities, lack of precedence, and resource constraints in designing a data collection program to evaluate a grid-based model's ability to characterize PM-2.5 covering wide scales of time (annual, seasonal, daily) and spatial resolution (regional, urban, local). On the positive side, a strong history of using ambient data for PM source apportionment probably is more adaptable to PM-2.5 analyses than ozone, given that the measurable components of secondary PM-2.5 (e.g., sulfate) have some direct linkage to precursors, whereas an ozone measurement by itself provides no inference regarding contributing precursors.

Several interesting atmospheric chemistry questions remain to be answered. Two examples include questions related to nitrate PM-2.5 formation and organic aerosols:

- Where and when do NH_3 and sulfate become limiting factors in ammonium nitrate formation? The relatively abundant nitrate PM-2.5 at sites in the urban West contrasts with abundant regional sulfate PM-2.5 in the East. Substantive decreases in SO_2 emissions, while reducing particulate sulfate, could lead to increased nitrate PM-2.5 formation in the East, if sufficient ammonia (a highly uncertain emissions category) is available.
- What impacts will NO_x emission reductions have on PM-2.5? If nitrate is significant, one would expect a reduction in PM-2.5. However, if sufficient sulfur remains available, NO_x reductions could increase or decrease sulfate formation (and therefore PM-2.5). Reductions in NO_x emissions could actually lead to sulfate increases by reducing competition between SO_x and NO_x for gas phase oxidizing radicals, or by increasing peroxide levels leading to greater aqueous phase sulfate production. NO_x reductions could slow down sulfate formation through overall reductions in ozone and other oxidants. This relationship is very complex and, thus, assessments of the possible PM-2.5 benefits associated with NO_x reductions in the Eastern United States should include consideration of the relationship of oxidants, SO_x, NO_x, and NO_x to nitrate formation.

Other examples include:

- What are the relative contributions of primary and secondary organic aerosols across varying spatial and time scales? The potential for large secondary organic aerosol production from biogenic sources (e.g., pinene emissions) exists throughout the East.
- How significant are biogenic-derived aerosols compared to local/urban contributions from primary anthropogenic organic aerosols?
- How different are these relative contributions across seasons, given that secondary organic aerosol formation increases during the summer?

Many uncertainties underlie the integration of primary and secondary particles, aside from integrating particles and ozone. For instance, what are the interactive roles that elemental carbon emissions, other products of incomplete combustion, and geologic materials exert in both primary contribution to PM and as formation nuclei for highly complex secondary PM? On balance, our ability to perform ozone air quality assessments far exceeds that of PM-2.5. However, the infrastructure for conducting PM-2.5 analyses appears to be in place as a result of progress gained from ozone and acid deposition modeling and existing

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monitoring programs for ozone and visibility (e.g., the Interagency Monitoring of Protected Visual Enviroenments [IMPROVE] program). Finally, although uncertainties remain in transforming particles into visibility impairment within short averaging times, the IMPROVE methodologies for particle and visibility measurements and the relationships between particles and visibility (extinction efficiencies) are widely accepted. Specific issues relating to PM and ozone interaction include the ability to formulate fully integrated models accounting for multidirectional effects on several pollutants. For example, the formation of secondary organic aerosols is a loss mechanism for VOC that presently is not accounted for in ozone models. Many other integration topics exist, and collectively there is uncertainty regarding the overall importance of one pollutant imparting an effect on another.

Three basic issues span the gap between science and policy: a) the adequacy and credibility of analytical tools, b) the manner in which tools are applied, and c) accommodating scientific findings and uncertainties in air quality management decision making. The first two topics reflect the ability of modeling and analysis tools to properly represent the relevant atmospheric physical and chemical processes and concerns of how one applies deterministic (i.e., models that establish exact cause and effect relationships) and uncertain air quality models to probabilistic forms of the standard in ascribing control requirements. Also, resource constraints of sophisticated air quality models frequently dictate that air quality analyses be limited to selected, short-term meteorological episodes rather than being based on a full year(s) of meteorological data. This limitation makes it difficult to design optimized control strategies because of the uncertainty associated with extrapolating the results to all observed meteorological conditions. Equally complicated is the emerging need to model seasonal and annual cases. The debate on the credibility of models is fueled by the manner in which they are applied as much as the valid concerns about their formulations and supporting databases. The third topic acknowledges the need for conducting policy-relevant as opposed to policy-driven research, and recognizing the different time scales operating in the research arena and the policy arena where the time frame demands move much faster than research results. Extremely useful information emerges continuously from research programs, yet a separate, sometimes very significant, time lag occurs before information is considered in the policy setting process. Hence, opportunities must be available to incorporate the latest science into policy through periodic reassessments.

Integrating Models and Observations for Sound Air Quality Management Practice

Much emphasis has been placed on the complementary and integrated use of models and ambient data in air quality management practice. Several facets are associated with this topic, ranging from the need to evaluate models with sound databases to conducting fully integrated analysis optimized through the separate, strong attributes of data and models. As the technical debate on the use of models and data continues to mature, perceptions such as model or data are replaced by the intelligent and integrated use of models and data. The demand for measurements as ground-truthing and feedback information loops has been adopted by large segments of the air quality community.

An appreciation of the strengths of models and observations can assist the understanding of current analyses and lead to improved techniques. A model's strength is its ability to: 1) integrate an enormous spectrum of data (e.g., emissions and meteorological variables) and process understanding (e.g., chemical mechanisms and flow phenomena), and 2) serve as an exceptional space and time mapping tool. This latter attribute reflects the model's unique ability to predict into the future and to supplement or fill in present

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gaps in observed data. The process formulations embedded in models enable the addressing of so many "what if" questions related to emissions control. However, models are engineering tools that invoke substantial approximations of scientific understandings of natural phenomena. Both their formulations and application methods reflect engineering principles more than fundamental science. Observations provide a basis for testing and diagnosing models, but in some instances, can capture process type relationships by themselves (e.g., the emergence of observational based models for defining NO_x and VOC control preferences). However, the observations are somewhat sparse. Hence, applied in isolation, the use of models or observations is not acceptable. Space and time constraints often bias the interpretation of observational analyses (e.g., analysis results reflect time and space of monitors which may or may not reflect the scales of concern). Models suffer from a large spectrum of weaknesses because they attempt to portray so many phenomena. Most critical though is the risk of using a potentially biased model that is not accompanied by a description of the uncertainties and biases inherent in the model. The integrated use of observations and models mitigates the individual weaknesses of both approaches and produces a powerful air quality management tool, especially when applied in an iterative, even retrospective, manner to continually assess model results and related implementation strategies.

Summary

Air quality assessments for PM, ozone, and regional haze must consider emissions, meteorological processes, geography, atmospheric chemistry, and deposition, all of which interact over multiple spatial and temporal scales. Examining in detail the sources only from the Metropolitan Statistical Area (MSA)/ Consolidated Metropolitan Statistical Area (CMSA) surrounding the monitor reporting nonattainment levels of air quality may need to be augmented (on a space and time basis) to allocate those levels responsibly to the sources causing them. When examining the issues on expanded time and space scales, air quality management should also take into account the similarities of these air quality indices such as their common precursor emissions (e.g., NO_x, VOC), common emissions sources (e.g., mobile sources, stationary and area source combustion emissions, biogenics), and shared chemical and meteorological processes (e.g., transport, transformation, precipitation, removal).

The principal technical issues associated with integrated air quality management involve the adequacy of three-dimensional databases and models, including specific process formulations, on which to base credible assessments. Many of these gaps are interconnected, since model evaluations rely on available, high quality measurements of emissions, atmospheric processes (such as wind fields) and ambient concentrations. On balance, the ability to perform ozone air quality assessments far exceeds that of PM-2.5, due mostly to the maturity of ozone research as well as lack of urban PM-2.5 measurements and important emissions components. However, many of the components of the infrastructure for conducting PM-2.5 analyses appear to be in place as a result of progress gained from ozone, acid deposition, and visibility modeling and monitoring programs.

The integrated application of models and observed data is strongly encouraged. In combination, both approaches help to mitigate the weakness of an isolated approach, producing a powerful tool for air quality management.

4.3 Interacting Spatial Scales of Emissions, Atmospheric Processes, and Air Quality Indices

As explained previously, a variety of emissions are precursors to elevated levels of ozone, PM, and regional haze. Historically, attempts at air quality management of these air quality problems focused on local sources in the context of an anonymous

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background term representing natural background and other unknown, distant sources. The evolution in our understanding of the spatial and temporal scales of the effects on ozone, PM, and regional haze on the emissions from all sources has, however, spawned the recognition of the need for a larger geographical perspective. This larger geographical perspective, which considers individual sources over regional as well as local scales, is needed to support quantitative analysis of the relative contribution of the various source types and of their emission types (species) that contribute to "nonattainment" levels. The need for an altered perspective has been recognized by the establishment of OTC, OTAG, NARSTO, and GCVTC.

Air quality management on the MSA or CMSA has worked well historically to control the local source effect on nonattainment problems. This is evidenced by the significant decrease in the number of ozone nonattainment areas over the past decade. As these controls have reduced emissions and as modeling tools have progressed, the role of the effect of sources beyond the MSA or CMSA and the varying spatial scales of air quality indices and atmospheric processes continue to be investigated and supported by a strong body of scientific evidence.

This evidence indicates that, while sources still have their largest influence in the near field, the zones of potential influence of source regions (e.g., an urban city or wildland fires) can, under certain conditions, extend out hundreds of miles for ozone, PM, and regional haze. In other words, sources once thought to be remote with respect to nonattainment levels of ozone, PM, and regional haze are seen as potential contributors to those levels. The analyses suggest that chemical and meteorological processes which influence pollutant generation, air mass movement, and pollutant removal (e.g., clouds and precipitation) are key factors in delimiting regional zones of influence. When the various nonattainment areas of the Eastern United States are surrounded by conservative estimates of the zones of influence of these other sources, a modeling domain that may span the greater part of the Eastern United States results. Accordingly, efficient air quality management requires addressing these additional sources, atmospheric processes, and related impacts as scales of interactions over multiple spatial and temporal frames.

Several physical and chemical events act together in determining pollutant concentrations over multiple space and time scales. Moving air masses carry all chemical species including precursors, fast-reacting intermediates, and chemical sinks, as well as the specific pollutant species of interest (e.g., PM-2.5 and ozone). Removal of pollutants occurs continuously through deposition. Also, the impact of these pollutants is not simply additive. Ozone (and precursors) transported from one location can affect ozone levels downwind by indirectly accelerating atmospheric chemistry reactions through the production of chemical intermediates (e.g., hydroxyl radicals). Clouds play several roles in modifying concentrations by: (1) dissolving soluble gases (e.g., nitric acid, SO_2, hydrogen peroxide) and generating aerosols through aqueous phase reactions, (2) circulating and venting pollutants to high altitudes where strong winds promote large horizontal transport, and (3) removing pollutants through precipitation. Cloud related dissolution and transport also contribute to pollutant removal, depending on one's reference frame. Vertical air mass movements, e.g., as in the daily mixed layer growth or as in coastal regimes, affect air concentrations on various scales. Superimposed on these processes are a variety of emission sources with their own spatial, temporal, and component (speciation) scales. Depending on location, pollutant, and season, one particular spatial scale (e.g., urban) may or may not exert a dominating influence on air quality relative to another scale (e.g., regional). Even in cases where local and urban sources are responsible for most of the local air quality, an assessment of the contribution of distant sources to local air quality is required to reach such a conclusion.

The Eastern United States differs markedly from the West, so any extension to the West based on eastern analyses or vice-versa may not always be appropriate (important differences exist between northern and southern regions as well). Monitoring data and modeling analyses highlight the challenge of identifying and quantifying specific sources, some at great distances, in order to estimate their effects in western national parks and wilderness areas. The variations in topography, meteorology, and source distribution across regions require that area- and case-specific differences be accounted for in any air management approach. The effects of emission reduction strategies should be viewed through multiple scales, considering regional and urban scale consequences (i.e., health and welfare protection).

A few points summarizing interacting scales and regionality should be considered in air management practices:

- Analyses of observations in the Eastern United States reveal the existence of very broad multistate regions (interacting scales approaching linear extent of 2,200 miles or more) of elevated pollutant levels and zones of source influence.
- Air quality modeling for the East suggests that similar regions of influence exist for ozone and PM-2.5, although only sparse monitoring data exist to support these similarities.
- Modeling analyses for the Grand Canyon National Park and other Class I areas show that PM-2.5 and precursors causing visibility impairment episodes are derived from both nearby (less than 120 miles) and more distant (up to 2,200 miles) regions of influence.
- Area- and case-specific analyses are required to delineate reasonable geographic areas for air quality planning purposes because of the wide regional variations in meteorology, topography, and source distribution.
- The use of terms such as “transport” or “background” inadequately describes the complex set of emissions, chemistry, and meteorological processes and interacting scales which contribute to the regionalization of air pollution.

Because of broad spatial extent of interacting scales ranging from regional down to local scales, assessments of air quality issues for specific areas may need to include the effects of sources of pollutants outside that specific area.

4.4 Area of Influence/Area of Violation Issue Paper

The STSWG recommends using scientific methods to establish cause and effect relationships to solve ozone and PM air quality problems. We recommend that the problem area be identified as an AOV. However, we recognize that all or part of the cause of the problem may come from outside the AOV. Thus, we recommend that appropriate technical approaches be used to identify the cause of the problem, so that a geographic AOI can be defined for each AOV. Then the planning would continue by developing a set of appropriate and effective control measures. A similar process for the implementation of the regional haze rule would probably also be needed, except that an AOI for each Class I area would need to be defined.

This process provides decision makers with a greater degree of confidence that the controls that are implemented will be successful in eliminating the fundamental cause of the air quality problem. The STSWG recognizes that uncertainties in analytic techniques will naturally lead to uncertainties in the process and, therefore, recommends an iterative process that uses future actual emissions and ambient air quality data to refine air quality projections and make mid-course corrections when necessary.

4.5 Summary

In conclusion, the issues highlighted above illustrate STSWG’s position that there is a continued need to obtain additional and improved air quality, emissions, and

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meteorological data, and to carry out sufficient data analyses (including air quality model development and application), that can be standardized and applied site specifically and on a regional scale. The FACA Subcommittee should explicitly state the need and importance of gathering these data and endorse the continued advancement of analysis tools in order to provide an adequate technical foundation on which to base future policy decisions.

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CHAPTER

5

Strategy for Communication of Findings and Recommendations

5 STRATEGY FOR COMMUNICATION OF FINDINGS AND RECOMMENDATIONS

EPA has initiated a variety of public outreach activities to inform the public and stakeholders about the FACA Subcommittee, its role, progress to date, and its recommendations; the proposed and final NAAQS rulemakings; and the transition policy to implement the revised NAAQS. These outreach activities will continue as the EPA and States/Tribes work together to implement the revised NAAQS over the coming years.

EPA's NAAQS-related public outreach program has used a variety of media to disseminate both background/general information and technical information to interested parties. To date, the program has included the following elements:

- Electronic communication mechanisms
- Development and distribution of NAAQS-related materials (brochures, fact sheets, and media releases)
- Meetings and briefings.

5.1 Electronic Communication Mechanisms

The Ozone, PM and Regional Haze FACA Bulletin Board has been available on EPA's Office of Air Quality Planning and Standards' (OAQPS) TTN (http://www.epa.gov/ttn/) since April 1996. Through this site the public can access NAAQS background information and the various issue papers developed by the FACA Subcommittee work groups. The public response to this site has been very supportive and the number of downloads since that time is indicative of both its success and the widespread use of the internet for information distribution. Figure 5-1 depicts the number of weekly FACA downloads on the TTN for the calander year 1997.

EPA's AirLinks site (http://www.epa.gov/AirLinks/) also has been a popular site, and was used as the primary mechanism to provide the public and others with fact sheets and other information related to the November 1996 proposal and July 1997 promulgation of new air quality standards for ozone and particulate matter and the new regional haze program. EPA has developed an implementation website to provide information on implementation guidance development (http://ttnwww.rtpnc.epa.gov/implement). This website also will track the implementation of the PM-2.5 monitoring network, and will be available through the AirLinks address above. EPA is working with several multi-state organizations to provide national real-time air quality data to the public in an easily accessible and understandable way. EPA is examining ways to partner Federal with State, and local, agencies to leverage existing technology, develop user interfaces and data presentation formats, and develop a "cookbook" to ensure consistent approaches among the States.

5.2 Development and Distribution of NAAQS-Related Materials

To provide information about the new air quality standards and implementation activities, EPA has developed an array of background materials on ozone, PM, regional haze, the NAAQS rulemaking process, and implementation strategy. These materials include:

Regulating Smog and Particle Air Pollution: An Integrated Approach (EPA-456/F-97-003)

Proposed Revisions to the Ozone and Particulate Matter Air Quality Standards (EPA-456/F-97-003)

Final Revisions to the Ozone and Particulate Matter Air Quality Standards (EPA-456/F-97-004)

Regional Approaches to Improving Air Quality (EPA-451/K-97-001).

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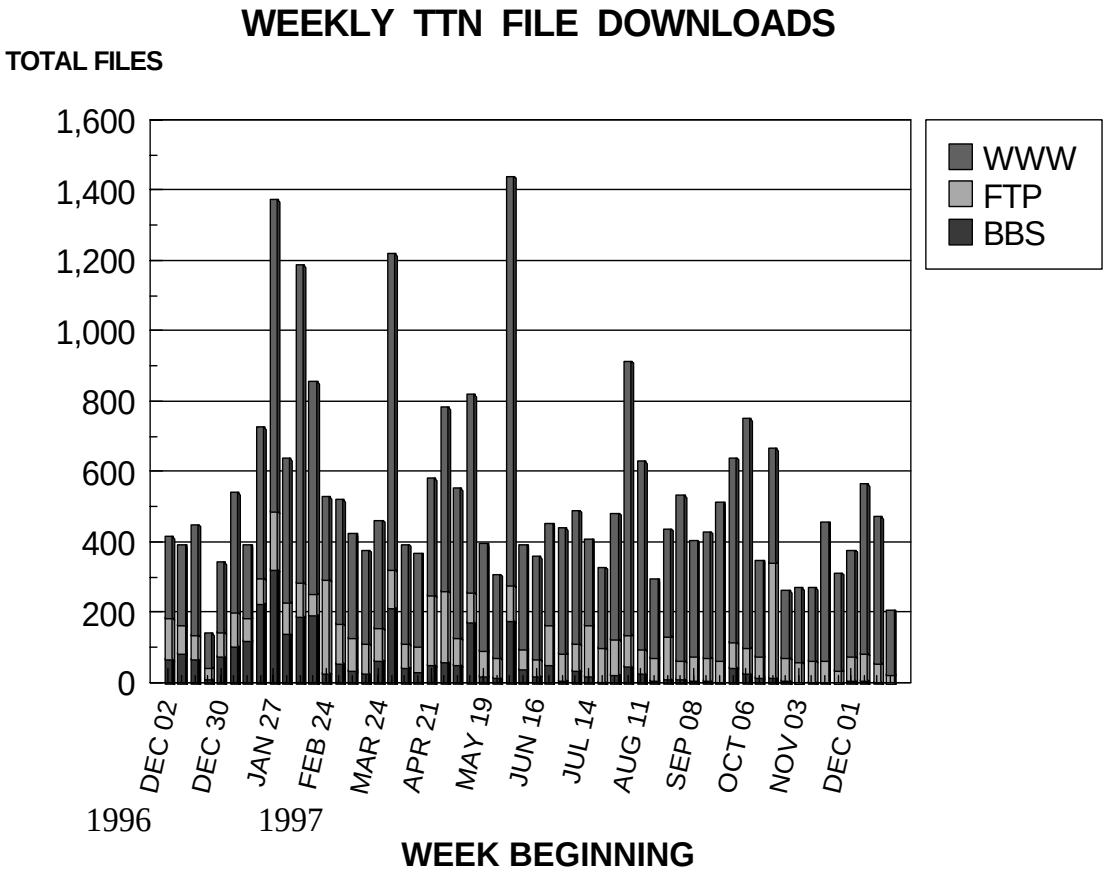
5.3 Meetings and Briefings

EPA has conducted a number of briefings to its Regional Offices, Congressional staff, and public interest groups. These briefings updated interested parties on the status of the FACA process, NAAQS revisions, and the transition policy. Additionally, EPA held four public meetings on the proposed ozone and PM NAAQS revisions, two public meetings prior to issuing the proposed rulemaking and one public meeting on regional haze. The Subcommittee meeting also were open to the public. Finally, EPA conducted several satellite broadcasts over its Distance Learning Network to provide a forum for discussion of ozone/ PM NAAQS-related issues with targeted State/local agencies.

Figure 5-1. FACA Downloads on the OAQPS TTN



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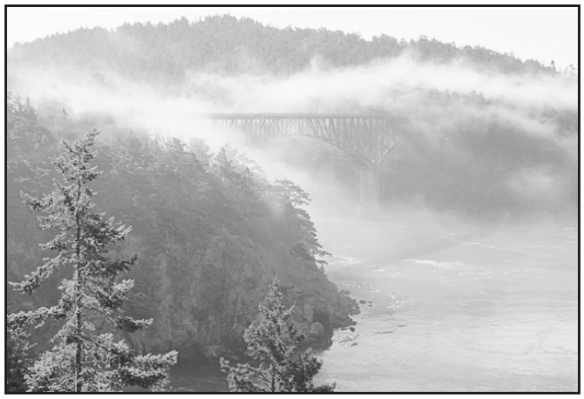

APPENDIX

A

Membership of FACA Subcommittee & Work Groups

APPENDIX A

Membership of Subcommittee and Work Groups

FACA Subcommittee Members

Name	Affiliation
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William Hamilton, Designated Federal Official	U.S. EPA
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Richard Ayers*	Howry & Simon
David Baron	Arizona Center for Law in the Public Interest
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Carla Berroyer	American Assoc. of State Highway and Transportation Officials
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Stephen Brick	Clean Air Task Force
Vincent Brisini*	Pennsylvania Electric Company
Georgia Callahan	Texaco Corporation
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Glen Cass	California Institute of Technology
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Hank Dittmar	Surface Transportation Policy Project
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John Dunlap	California Air Resources Board
Richard Dworek	U.S. Steel
Larry Feldcamp*	Baker & Botts
Jeff Gabriel	National Pork Producers Council
Mary Gade*/Dennis Lawler	Illinois EPA
Stephen Gerritson*	Lake Michigan Air Director's Consortium
Thomas Godar*	American Lung Association
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William Luneburg	Group Against Smog and Pollution

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Jeb Stuart	Construction Industry Air Quality Coalition
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Ted Wernick	Gillette Company
Joe Williams	WESTAR
Mike Wright	Steelworkers of America
Robert Wyman	Latham & Watkins
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* Denotes CAAAC Membership

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David Hawkins	Natural Resources Defense Council
Richard Hayslip	Salt River Project
Shawn Kendall	Phelps Dodge Corporation
Gay MacGregor	U.S. EPA
Timothy O'Brien	Ford Motor Company
Jerry Pardilla	National Tribal Environmental Council
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Rich Halvey	Western Governors' Association
Robert Kappelmann	Jacksonville Electric Authority
Dennis Lawler	Illinois EPA
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Barbara Lee	North Sonoma Air Pollution Control Department
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William Luneburg	Group Against Smog and Pollution
Arthur Marin	Northeast States for Coordinated Air Use Management
James Mentesti	Greater River Economic Development Foundation
Joe Minott	Clean Air Council
Brock Nicholson	North Carolina Department of Environmental Management
Robert Palzer	Sierra Club
Steve Pezda	Ford Motor Company
Richard Phelps	Eastman Chemical Company
Jim Ralston	New York Department of Environmental Conservation
Jim Salvaggio	Pennsylvania Department of Environmental Protection
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Herb Williams	Texas Natural Resources Conservation Comission
Mel Zeldin	South Coast Air Quality Management District

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Jayne Mardock	Clean Air Network
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Quin Shea	National Mining Association
Scott Thomas	Oklahoma Department of Environmental Quality

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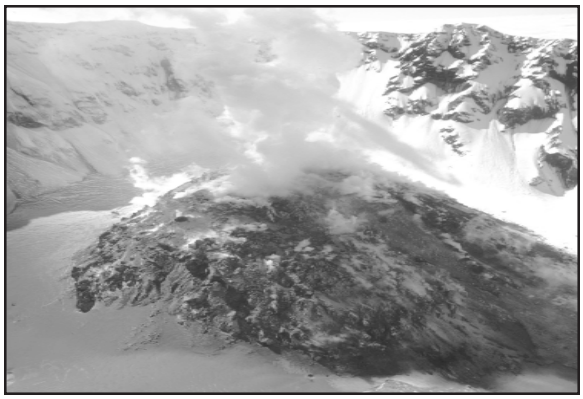

APPENDIX

B

Issue Paper Summaries

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APPENDIX B - ISSUE PAPER SUMMARIES

The following are summaries of the 25 issue papers developed by the Subcommittee work groups. These summaries include a list of issues developed by the work group, a brief background of the issue, recommendations made by the work groups, and selected highlights of Subcommittee discussions on the issue paper. The meetings at which the Subcommittee discussed the paper also are indicated. The selected highlights of the Subcommittee's comments on the issue papers are not intended to be an exhaustive summarization of the discussions that took place. They are included to provide a better understanding of the nature of the discussions on the issue papers. Readers should refer to the meeting minutes which can be downloaded from the TTN website (http://www.epa.gov/ttn) for a more in-depth summary of the discussions that occurred. (To get to the FACA website go to the Directory of TTN Sites and then choose FACA.) For purposes of this report, the Subcommittee comments are grouped according to the sector making the comment (e.g., States and Tribes, Industry, Environmental/Public Interest Groups, etc.). It should be recognized that there may be a diversity of opinions within each sector regarding issues and recommendations. In many cases, the issue papers were developed by two or more work groups. When this has occurred, it has been documented in the text. To obtain a complete understanding of the issue papers and recommendations, the reader is referred to the full text versions of the issue papers found on EPA's TTN as referenced above.

B.1A Designation Issues for New NAAQS

Discussed at May and July 1996 meetings.

Issue #1 Should the approach to designation be changed to include areas that contribute to violations as well as areas that experience them?

Issue #2 How should AOVs be defined and identified?

Issue #3 How should AOIs be defined and identified?

Background

Section 107(d)(1) of the CAA requires EPA to designate areas as attainment, nonattainment, or unclassifiable upon promulgation of a new or revised NAAQS. The purpose of designations was two-fold: the public was made aware of the fact that an area violated the NAAQS, and the nonattainment designation identified areas where controls were needed.

In the past, both ozone and PM-10 were treated as local problems, and controls were required for sources within the nonattainment area only. Many air quality studies in the past decade focused on understanding the relationships between sources of pollutants and their precursors and recorded violations of the NAAQS (including relationships that may be characterized by transport). Although the transport process is not fully understood, increasing attention has been given to trying to assess the role that it may play in NAAQS nonattainment. The existing regulatory framework focuses primarily on controlling those sources in the nonattainment area. The issue addressed was whether the current regulatory framework should be kept in place or changed somehow to consider the transport of pollutants or precursors.

Recommendations from the BPAPWG and NRSWG

The BPAPWG and NRSWG recommended the following for the designation process:

1. The designation process should be changed to include areas that contribute to violations as well as areas where the NAAQS are violated. EPA should separate the nonattainment designation into two parts, AOV and AOI.

2. AOV boundaries should be defined solely by the geography of the ambient monitors where violations have been measured.

   The boundaries should be based on monitored data, and, where available, a combination of both monitored and modeling data. Modeling data should never be used alone as the basis for an AOV determination.

3. In determining AOI boundaries, anthropogenic and nonanthropogenic emissions should be considered. AOIs should be identified by county and MSAs and should be developed without identifying areas that have different emission types and levels, the so-called zones of influence.

Discussion by Subcommittee

Below are the highlights of selected Subcommittee comments on the three recommendations.

States and Tribes

- The current approach of "local solutions to local problems" should not be thrown out entirely.

Industry

- The AOV/AOI concept is preferable to the current designation process, but the interpretation of what constitutes an AOI might not be consistent across the country.
- Potentially affected polluters should be protected from enforcement actions while making good faith efforts to satisfy requirements of the standards.
- Industrial plants considering relocation could be unsure about their responsibilities for controlling emissions that might affect a downwind AOV.

Academia

- AOIs could be defined regionally or nationally instead of State-by-State to achieve more consistency.
- Data are insufficient to allow a particular monitor to represent a given spatial area.

Environmental/Public Interest Groups

- The way in which AOIs and AOVs would mesh within the current statutory framework is unclear.
- The discussion of the current nonattainment system is too negative.
- Retain the current nonattainment area designations and adopt AOIs on top of the current system to supplement it.
- Concern exists regarding the timing for designations if the current nonattainment system is abandoned.

Federal Agencies

- Questions remain over whether tools exist for determining AOIs.
- A need will arise for culpability analyses.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.1b How Should Areas of Influence be Determined?

Discussed at September 1996 meeting.

Issue #1 What are the mechanisms of defining AOIs?

Issue #2 How will the sizes of AOIs be determined?

Background

The NRSWG, which prepared this issue paper, first worked to define an AOI as a specified domain containing the set of anthropogenic and nonanthropogenic sources potentially contributing to downwind AOVs. An AOI designation would

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not mean that all portions of an area would be required to implement regulations, nor did it indicate that sources in all portions of the area would be subject to regulation. However, all areas within a defined AOI would be required to participate in planning, even when the boundaries of the AOI crossed State borders. All areas within an AOI would be required to participate in developing a SIP. The plan would address details such as which portions of an AOI should be subject to regulation and what the regulations would be and would consider the impact of each source and the costs to control specific sources. These complexities should be avoided as much as possible when making initial AOI determinations.

Recommendations from the NRSWG

The work group presented the issue paper as an update and indicated a need for further discussion on planning areas with help from the STSWG. They recommended a three-step approach to implementation:

1. Large planning areas would include all 48 contiguous States and the District of Columbia.

2. Within the large planning areas, the participants would define AOIs and establish the States that would be included in each AOI. All States in an AOI would be required to participate in the development of the SIP. The work group recognized that there likely would be cases of overlapping AOIs.

3. Individual actions would be worked out within the context of the SIP.

Members of the work group participated in an exercise where they were asked to propose AOIs on a map, based on technical information that had been presented to them and their own expertise.

When all pollutants were considered, it was obvious that there would be some large, complex, multi-pollutant AOIs. One result of this activity was the suggestion to initially have two large planning areas covering the Eastern and Western United States. The experience of OTAG and GCVTC would be used to formulate approaches for planning area activities.

The work group reached some preliminary conclusions on actions that would be needed:

- Develop planning regions, which would determine AOIs.

- Expect some large integrated AOIs for multiple AOVs and multiple pollutants.

- Use the best technical tools, including some kind of back trajectory or other model for establishing AOIs.

- Ask planning regions to specify the techniques they would use to determine their AOIs.

- Require each State in an AOI to participate in the planning phase for a SIP and prepare a SIP that would be consistent with the principles and objectives of the SIP.

If there are AOVs with local issues, allow the possibility of a State opting out of the planning and SIP process if it agrees to take on the responsibility for regulating local AOVs. An example is a small isolated valley that has a PM problem resulting primarily from wood stoves or unpaved roads.

Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments on the issue paper.

States

- A regional approach is important for focusing on real solutions, but all States should be involved in the initial planning.

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- Some States in the middle of the country do not automatically identify with either East or West problems.

- How to pay for the control programs across States must be addrressed and resolved.

Industry

- The EPA should consider the following process: all States in a planning area and AOI would agree to a regional plan, each State then would develop a SIP consistent with the plan, and only the SIP would be submitted for approval.

- There will be bureaucratic issues and other problems in the AOI planning process, especially if States end up split between two or more large planning areas.

- AOIs could be defined by geography; plans would determine which sources in AOIs needed controls. The choice of tools used to determine whether an area and source are contributing to an AOV is important, and EPA should consider natural sources in defining these areas.

- Experience in the Regional Haze Program has shown that certain meteorological conditions result in no haze, largely because of source density upwind. If these areas are left out of consideration, it will be difficult to account for future conditions; new sources could be built in areas where there currently are none and this might lead to future problems. An opt-out provision should be considered.

- An approach that uses appropriate scientific analyses to define the most important contributing sources is needed for defining AOIs based on their potential to contribute to AOVs.

- The work group should consider trading issues in its next iteration of the paper.

Environmental/Public Interest Groups

- Clarification on how this process would connect to NSR is required.

- There might be a technical issue about average versus episodic conditions caused by very different types of meteorology.

- Incentives for continuing progress during interim implementation should be put in place.

- EPA should be cautious in allowing opt-out opportunities; sometimes States define problems too narrowly.

- Emission strengths must be defined sufficiently high to observe their influences if sensitivity analyses are to be used to define an AOI and its contributing sources.

- Some mechanism is needed to: 1) reach agreement on issues related to decision making on AOIs and the ultimate allocation of control requirements among AOIs; and 2) put together an AOI plan, possibly a multi-State document that would have some binding force with SIPs.

- EPA should continue to mandate some form of emissions reduction while agreements are reached.

- A way should be developed to encourage progress until all plans are adopted.

- Models for allocating emission reductions are not very sophisticated. The Title IV example of emissions trading automatically driving “good enough” reductions might not apply directly to ozone, PM, or regional haze.

- Environmental groups will not accept recommendations that AOVs have no automatic controls. The notion that this concern can be addressed later is unacceptable.

Federal Agencies

- Finding tools for defining AOIs would be a daunting task, and the time and cost would be considerable.

Academia

- Plans should consider all sources in an AOI, not only those that would be included in an inventory.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.1c Update of Area of Violation (AOV)/ Area of Influence (AOI) Concepts

Discussed at November 1996 meeting.

Issue #1	What techniques and processes should be used to identify AOIs and develop regional plans?
Issue #2	How will localized AOVs be addressed?
Issue #3	How will broadly integrated AOIs be addressed?
Issue #4	How will the planning process incorporate the designation of AOIs and AOVs?
Issue #5	How will designation regions be identified?
Issue #6	How will reasonable further progress be measured?

Background

The concepts of AOV and AOI were developed and presented to the Subcommittee in the July 25, 1996, and September 19, 1996, draft issue papers which were being used to frame many of the implementation proposals being developed by other work groups. Since the presentation on AOV/AOI was made to the Subcommittee in Norfolk, the work group had the opportunity to evaluate comments made at that meeting and at subsequent work group meetings. This update was an attempt to summarize the overall concepts of AOV/AOI as a way to develop control programs for regional haze and attainment plans for areas violating the standards.

The AOV/AOI concepts developed because traditional nonattainment areas had not proven to be workable when violations result from transported as well as locally generated pollutants. The designation of a nonattainment area would identify both the area in which a violation occurred and the area that was causing or influencing the violation, where controls would be required to bring the area back into attainment. The designation of an area as nonattainment would trigger automatic regulatory requirements and create a number of problems. To overcome these problems, the work group set up the AOV/AOI approach, which separated the concepts of violation and influence and established a process to develop attainment plans that would be fundamentally different from the current nonattainment process.

Recommendations from the NRSWG

The NRSWG updated several of its recommendations on AOV/AOI.

1. The AOV was defined as a region that exceeded the ambient air quality standard and thus provided information on where people were being exposed to unhealthy air. The boundary of the

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region should be based on monitoring data or, where available, on a combination of both monitoring and modeling data. Modeling alone should not be the basis for determining AOVs. The work group recommended that, in areas lacking monitors or in which monitoring data were insufficient, a monitoring plan be required and implemented. Where AOVs for ozone and PM-2.5 overlapped, co-AOVs might be defined by the State or tribe in which the violations occurred along with provisions to coordinate planning and SIP/Tribal implementation plan (TIP) submittal dates. This approach would allow integrated planning and implementation. For Class I areas where regional haze had been identified as an air quality related value, the Class I area boundaries would define the area of concern, which would constitute the Class I regional haze equivalent of the AOV for ozone and PM-2.5.

2. The AOI was a specified domain containing the set of anthropogenic and nonanthropogenic sources potentially contributing to downwind AOVs. States and Tribes that were part of an AOI would be required to participate in developing a spatially integrated, or regional, air quality management plan. An AOI designation did not mean that all portions of the area would be subject to or required to implement regulations. This assumption was important to understand and accept. It allowed a more inclusive approach to identifying AOIs that encompassed all potentially significant sources. The AOVs might or might not be part of an AOI. This determination should be made early in the designation or planning process.

3. "Regional plan" was recommended as a new term, formerly referred to as a SPIP. It would not be an enforceable document, but rather would provide the framework in which SIPs and TIPs needed to fit. It would not be a substitute for SIPs and TIPs.

4. The work group recommended a three-step AOI process: identify AOIs, develop regional plans, and prepare SIPs and TIPs to reflect the process.

   a. AOIs would be identified by States and Tribes participating in broad subnational designation regions, minimally East and West designation regions.

      The designation of the AOI should be undertaken with the best tools available at the time that the designation group convenes. AOIs might subsequently be refined by the States identified by the designation group. This first step should be done quickly with the data currently available recognizing that the AOI could be modified by the States involved. It was anticipated that there would be considerable overlap of individual AOIs and that integrated AOIs would be needed in some areas of the Nation.

   b. The second step would be to prepare the regional plan and in that process refine the AOI, if needed, based on new information and better tools for analysis. All States that were a part of the AOI would be required to participate in the planning process. The regional plans must address both the actions needed to bring the AOV into attainment and the regional haze needs of the AOI.

   c. Regional plans would be created that would define the control region; set the level of control/culpability for each of the Tribes/States covered by AOI recommendations; make market-based incentive program recommendations, if applicable; and recommend Federal regulatory actions. The control region would be

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identified in the plan and would be the focus of the SIPs and TIPs developed through the regional plan. Federal actions might also be required in Step III. Regional haze actions needed by the affected units of government also would be identified in the appropriate plans and would be undertaken by the units identified.

5. The work group also recommended issues to be addressed later in greater detail. They included the identification of designation regions, the refinement of AOIs as data and analyses allow, and the definition of reasonable further progress.

Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments on the five recommendations concerning AOV/AOI concepts.

States

- There is a question over who would select the participants in the designation process, with particular interest in EPA's role. States in the middle of the country will not have the resources to participate in more than one planning region. Will each AOI require a regional plan and will centrally located States have to participate in AOI decisions for both Los Angeles and New York?

- A control region will be identified and then the AOI can be modified down the road in a dynamic process. Although the original convening body is not currently defined, the OTAG process is a good example. It will take approximately 6 months from the time an AOV is designated until an AOI can be determined and the appropriate people brought into the discussion. The overall process will take approximately 4 years. An AOV does not mean automatic inclusion in the AOI and the control/planning region. Also, if an AOI is designated and goes through the planning process, it is possible that the control region will not be the entire AOI. An AOI does not mean regulation in all cases.

- A mechanism is needed to keep entities "at the table" who do not want to be there, including EPA.

- Incentives will be necessary to get the regional mechanism in place and operational. Without such a mechanism in place, the entire AOI/AOV concept is threatened.

Industry

- In terms of Western regional haze, one recommendation includes entire States, rather than splitting the States of Texas, Oklahoma, Nebraska, etc. An option can be added designating the 11 Western States as one region and the rest of the country in some other manner.

- One interpretation of the issue paper is that a subdivision of the AOI has to prove that it does not belong at the table. There is concern over the point of view that an AOV is innocent until proven guilty; the premise that AOVs contribute to violations in some form until proven otherwise should be used.

- The STSWG said to use the best scientifically-based determination to determine what is causing the problem and develop the appropriate control strategy. Whether or not there are natural groupings or boundaries for the individual pollutants should be examined.

- Concern exists regarding the GCVTC's finding that nearfield sources contribute most significantly to violation problems. There is a need to get away from the concept that long-range transport is the solution.

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Environmental/Public Interest Groups

- The OTAG process has not been able to determine a State's involvement without the development of refined tools.
- Very important elements of the CAA seem to be missing from the work group's approach.
- The current approach of using a monitored exceedance to trigger a mandatory control program is supported.
- Doing a better job initially of defining who should be at the table is supported.
- The STSWG agrees that they do not have the capability to determine individual source culpability.
- Concerns exist over EPA's authority to force participation in the program and about how these issues will be merged with institutional mechanisms and new source review.
- Section 172 of the CAA lays out generic requirements that apply to SIPs for all nonattainment areas. Will those requirements be applied to an AOV under this concept?
- Support is withdrawn for any proposal that eliminates mobile sources, conformity, requirements for RACT, contingency measures, NSR, and RFP.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.2 Institutional Mechanisms for Development and Implementation of Regional Strategies

Discussed at September and October 1996, and February 1997 meeting.

Issue #1 Who establishes the institutional mechanism for regional air quality planning and on what basis?

Issue #2 What entities need to be included in regional air quality management institutions and what operational rules should they follow?

Issue #3 What authority should the regional institution have?

Issue #4 What role should regional institutions have in air quality management?

Issue #5 What role will a regional institution play in emission trading?

Background

In many areas where regional transport is significant, the current nonattainment area approach is not an adequate institutional mechanism to deal with the regional nature of the pollutants of concern. Support was withdrawn for any proposal that eliminated mobile sources, conformity, requirements for RACT, contingency measures, and RFP. New institutional mechanisms may be needed to ensure development and implementation of strategies to reduce regional transport of ozone, particulate matter, and regional haze, and their precursors. To develop an effective and equitable regional strategy, it likely will be necessary for a number of States, Tribes, local governments, existing regional institutions, and EPA to work in concert to assure consistency, efficiency, and broad public participation in the process. Some regional institutions may already exist that may be appropriate forums for developing regional strategies.

States and Tribes have primary responsibility for developing, implementing, and enforcing air quality programs, with EPA guidance and oversight. Similarly, States and Tribes should

have maximum flexibility to develop institutional mechanisms for carrying out their collective responsibility when interstate transport contributes to local or regional air quality problems.

The CAA gives EPA authority to establish transport commissions and air quality control regions. EPA would be able to establish RAMPs using this statutory authority, relying on its general rulemaking authority to provide direction and schedules to the RAMPs. RAMPs could be set up by modifying the charter of existing regional organizations, such as GCVTC and OTAG, or by creating new regional institutions. Two to six RAMPs could be established initially, with the potential for the establishment of additional or alternative regional institutions as AOIs are identified.

Recommendations from the NRSWG

Following are the recommendations related to the establishment of RAMPs or other regional institutions made by the NRSWG at the February 1997 meeting.

1. Institutional mechanisms are needed to address multi-jurisdictional air quality issues. The method for establishing the institutional mechanism must be adequate to ensure that planning and implementation occur in a timely manner. New institutional mechanisms should complement, supplement, or replace functions served by existing institutions. EPA should use its Air Quality Control Region (AQCR) authority to form RAMPs as soon as possible, preferably by early 1998, to expedite planning efforts. EPA should use its general rulemaking authority to outline RAMP activities and time frames. Once RAMPs have identified possible areas of violation and associated areas of influence, the formation of transport commissions may be appropriate.

2. Regional air quality institutions should include representation from all levels of government with regulatory authority over sources contributing to an air quality problem; and participation by stakeholders to facilitate the development of understanding between regulators, the regulated community, environmental organizations, academia, and the general public. All States in a defined region should be included in the institutions. States and Tribes would negotiate Tribal representation based on unique regional factors. EPA would be a participant, and the inclusion and voting status of Federal-level cabinet officials would be determined by the institution based on the issue being addressed. Criteria and a process must be established that would allow States and Tribes to: 1) opt out of a RAMP if they have been included erroneously or their participation is no longer useful or necessary; and 2) to petition EPA for inclusion of additional States or Tribes in the institution.

3. The authority of the regional institution must be clearly defined. The most essential principle is that the institutional mechanism must be adequate to ensure the timely development, implementation, and enforcement of regional strategies. Duplication of effort must be avoided. States should retain primacy, subject to EPA oversight and Federal Implementation Plan (FIP) authority, to the greatest extent consistent with air quality goals, with responsibility assigned at the lowest level of government practicable. The current SIP/FIP approach should be used to ensure implementation with incentives for early collaboration within the RAMP. This approach would give EPA the responsibility to issue SIP calls by some date certain (i.e., establish requirements for SIP and TIP implementation plans based on or in lieu of recommendations adopted by the regional institutions) and to impose a FIP or other sanctions if one or more jurisdictions fail to take timely action.

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4. A regional institution formed primarily for the purpose of addressing multi-jurisdictional air quality issues may have any of a number of responsibilities. At one extreme, the institution may have a very limited role such as providing a forum for States and Tribes to discuss shared problems. At the other extreme, the regional institution could allocate emission reduction responsibilities between jurisdictions, require the implementation of specific regional control strategies, and further obligate States or Tribes to achieve emission reductions. In any event, the regional institution should have a role in ensuring that a regionally integrated plan is developed for air quality problems that involve interstate transport of pollution. Regional institutions (two to six initial RAMPs) should have significant roles, with the understanding that some or many functions (other than the preliminary identification of AOIs) may be assigned to AOI-based regional institutions.

5. Assuming that the preferred approach to implementing new NAAQS and the Regional Haze Program involves establishing regional emissions cap and trading programs, regional institutions should oversee the orderly transfer of emission credits between jurisdictions, including developing protocols for tracking, verifying, recording, and otherwise overseeing the conditions of, interstate and other inter-jurisdictional emission reduction credit transactions. Institutional mechanisms should also be structured to support the development and implementation of incentive- and market-based approaches to managing regional pollution problems, including developing positive incentives for upwind areas to reduce precursor emissions. The RAMP should initiate discussions concerning potential market-based emission management programs within the RAMP and look at whether RAMP-wide markets are necessary or appropriate.

Discussion by the Subcommittee

Below are highlights of selected Subcommittee comments on the options and recommendations outlined by the work group at the February meeting.

States And Tribes

- RAMPs should be used only to determine who participates and should not generate any regulations. The sovereignty of States and Tribes must not be violated.

- The costs of participating in a RAMP need to be addressed. OTAG has shown that these costs easily can run into millions of dollars.

- International cooperation is an issue, and the transport of pollutants across U.S. borders needs to be addressed.

- The initial AOI designation is very important, and 3 months is not sufficient time to make this determination. If the planning areas are too large, the procedure will not be productive and will not allow for a good regionally integrated plan.

- Questions were raised about how RAMPs and EPA regional offices will work together.

Industry

- Concerns were voiced about what will happen when there are two or more sources in different States in the same RAMP or AOI, and whether there will be a provision to allow similar controls to be implemented.

- In large RAMPs it may take a long period of time for work to be accomplished, so RAMPs may benefit from being small. Industry and environmental groups should

be represented in RAMPs, perhaps as non voting members. On the other hand, for efficiency RAMPs may need to be large with fewer RAMPs than AOIs.

- Planning organizations may not adequately understand regional haze. They will need mechanisms in place to make quick determinations of whether a regional haze issue is local or regional and should have ways to expedite planning for regional haze.

- The details of the process are important and mechanisms should be put in place that will force participation by reluctant players.

- In the West, it may not make sense for every State and Tribe to be part of a RAMP, except perhaps in the case of regional haze. The process should not assume that every party has to be in a RAMP.

Environmental/Public Interest Groups

- Nothing in the proposal for RAMPs changes the fact that individual States are responsible for implementing overall air quality management plans. The process does not screen out situations where a governor has the authority to reduce emissions in a State before the RAMP process is implemented. A policy recommendation that allows States until 2003 to submit a SIP is unacceptable. It will take even longer to implement a multi-State process.

- States that say they cannot attain solely because of transport must come to the EPA and demonstrate this claim.

- RAMPs should not allow States the opportunity to get around current prescriptive nonattainment measures.

- If RAMPs are given the responsibility for drawing boundaries for AOIs, the process is going to become politicized; the current approach that puts the onus on the individual States needs to be preserved.

- Currently available science may not be able to address the AOI issue very effectively; the process may get too big and too complex to function effectively.

Academia

- The STSWG agrees with the AOI/AOV methodology because the technique can identify cause and effect relationships. However, if the process allows final AOIs to span RAMPs, then STSWG believes the determinations will be 90 percent political and 10 percent sound science.

- The responsibilities for having adequate funding and personnel will place great pressure on RAMPs.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.3 Regional Air Management Partnerships (RAMPs) and Areas of Influence

Discussed at February 1997 meeting.

[Official Name: *Regional Air and Management Partnerships and Areas of Influence: A New Approach to Air Quality Control Regions*]

The issue paper initially identified the following nine issues. However, they never were developed in the issue paper.

Issue #1 What are the timing and legal authority for RAMPs/AOIs?

Issue #2 What decision-making process should be used for RAMPs and AOIs?

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Issue #3 What process will be used to identify complex AOIs?

Issue #4 How are NSR and RFP affected during the period of regional implementation plan (RIP) preparation and after the AOI has been identified?

Issue #5 What is the timing of rebuttal presumption for AOVs being part of AOIs?

Issue #6 How will maintenance of the standard relate to AOIs and reasonable progress toward the national visibility goals?

Issue #7 How will nonattainment provisions of the current CAA integrate into the RAMP/AOI/AOV process?

Issue #8 How will coordination take place for technical tools and databases?

Issue #9 What is the legal status of RIPs?

Background

The issue paper outlines a five-step process for establishing RAMPs, identifying AOIs, and developing plans, and establishes a timetable for promulgation:

Step 1 - RAMP formation: This step should begin in June 1998 or sooner pending the final rulemaking.

Step 2 - Initial RAMP Activities: This step should take place any time between June 1998 and June 1999 or sooner, upon formation of the RAMP.

Step 3 -Identification of Preliminary AOIs: If AOV designation occurs by June 1999, this step should be completed by September 1999.

Step 4 - Preparation of the RIP and SIP/TIP calls: This step should be in place by June 2001.

Step 5 - SIP/TIP Preparation: This final step should be accomplished by June 2003.

Recommendations from the NRSWG

NRSWG made the following recommendations for each of the steps listed above.

1. RAMPs should be formed by taking into account both technical and political considerations when identifying areas that have common air quality characteristics and problems. Every State and Tribe, except Alaska and Hawaii, should be placed in a RAMP. At its request, a State or Tribe may be placed in more than one RAMP. Its placement in a RAMP does not require a State or Tribe to participate in the RAMP's activities. However, RAMP recommendations and polices may affect nonparticipants.

2. A RAMP should undertake activities to identify preliminary AOIs and assist States and Tribes in developing RIPs.

3. The steps in identifying a preliminary AOI will follow guidance provided by EPA. The RAMP may identify States or Tribes outside of its area as part of an AOI. A State or Tribe in a RAMP may indicate it will take sole responsibility for RIP development for one or more AOVs. At this point the RAMP no longer would have responsibility for identifying AOIs for those AOVs. RIP and SIP or TIP development could be consolidated into a single step. A RAMP must identify its AOI within a prescribed time period or EPA will make the identification. All identifications will be reviewed, approved, and/or modified by EPA.

4. States and Tribes identified in the preliminary AOI will be responsible for preparing the RIP. All RIPs must contain a minimum set of elements. In the absence of an approved RIP at the deadline, EPA will move ahead to issue SIP or TIP calls based on available information. The RIP will identify the control regional that constitutes the final AOI.

5. State and Tribes must prepare their SIPs and TIPs to bring AOVs into attainment of standards by dates established in the regulations.

Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments on the issue paper from the February 1997 meeting.

States and Tribes

- The proposed RAMP will only be used to determine who comes to the table to participate. It will not generate any regulations or recommendations; the States will do that. The paper does not really address this issue. The work group has not addressed remedies for failure to keep this process moving, but has assumed that the process will start and keep moving.

- There is a question about why the proposal did not include participation of local air quality jurisdictions, especially when they have significant autonomy on these issues. Also, there is no discussion of transaction costs (e.g., attending monthly meetings). The OTAG process has shown that these costs can easily run into millions of dollars. There is a need to discuss a regional approach, to avoid a situation where a group of States would be left pointing fingers at each other. Finally, there need to be allowances for incentives for early reductions and early compliance.

- There is a question over who else can be invited to participate. The paper does not talk about issues related to areas such as British Columbia or Mexico. The issue about international transport across U.S. borders is significant. For instance, the U.S./Canada Clean Air Accord might be used as a mechanism.

- It is unclear how AOVs fit into the process and schedule. For example, there are no PM-2.5 data, and there will not be sufficient data for another 3 years. That situation will affect the timetable. The response was that the time line was expressed in months following designation of a violation. Thus, if it takes 3 years to designate, then the preliminary AOI would be due 3 months from whenever that area was designated as an AOV.

- Merely having the RAMP participants complete analyses and then assuming that this process will provide a joint acceptance of controls is presumptuous.

- RAMPs should not be created out of new cloth. There is sufficient information already available to help make these determinations. The Subcommittee should heed the importance of not violating the sovereignty of States and Tribes. RAMPs, as proposed, can be very effective in dealing with these problems.

- RAMPs must be properly financed.

- The RAMP/AOI/AOV concept is necessary. The bulk of the problems is with the individual States and can be handled within State boundaries.

- The Subcommittee has to prepare plans, and funding issues will have to be addressed when the time comes. Under the approach, every AOV will have an AOI. Stating that the county

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that measures the violation is in nonattainment simply does not work. Ultimately there needs to be a better process by which to make these determinations.

- This process is building on an air quality management concept that was envisioned 25 years ago. Perhaps there is a need to simplify and streamline the process. Perhaps a cost analysis is needed to determine how we can continue to support these programs. In 1999, EPA is coming back to States and asking them to consolidate. There is a concern that the resources and the personnel will not be available to implement this approach. This management concept could work, given the necessary resources, but without them the process is doomed to failure.

Industry

- A "backstop" provision is needed to prevent a State from reneging on a RAMP agreement or implementing actions that are not a part of the RAMP. The response was that implementing additional actions is not a problem if a State also meets the goals of the original RAMP. If a State implements something that does not provide for clean air as an alternative strategy, however, it will fall back on EPA to act under the CAA.

- There is concern over the large RAMPs being too unwieldy to achieve acceptable progress. It might be desirable to structure the RAMP as a small entity, including industrial stakeholders as non voting members. If industry is invited, then environmental groups should also be included.

- The RAMP process is a good one. It is basically the model that the GCVTC followed. The first step in this process is to start filling the tool box. Then the planning organization needs to start understanding regional haze. As the planning group begins to make regional haze determinations, the tool box is already in place, and it should be possible to make a quick determination of whether it is a local or regional issue. As local plans are proposed and implemented, they need to be factored back up to the regional level for inclusion in the regional analysis.

- The devil is in the detail, and this is one of the dilemmas of this advisory process. This is an opportunity to force participation by those who may not really want to participate. First and foremost, violations must be identified, and then the planning process will use technical expertise to define the AOI.

- In response to the statement that RAMPs will not work, there are examples where they have already worked: GCVTC, OTC, southwestern Pennsylvania. These programs were implemented because the previous control scenarios were not working effectively.

- RAMPs need to be larger than EPA regions and there should be fewer RAMPs than AOIs. Additionally, if areas move faster than the prescribed plans, there needs to be a provision for these areas to recapture credits.

- There is a problem with the proposal in that it presumes that every State and Tribe must be part of a RAMP. In the West, this may not make sense. Criteria need to be developed to determine whether a RAMP is needed.

Academia

- There is full agreement in STSWG with the AOI/AOV methodology because the approach is seen as a means of identifying cause and effect relationships. However, if the process allows final AOIs to span RAMPs, then their determination will be seen as 90 percent political and 10

percent sound science, and the STSWG will withhold their approval. Most of the technical work is in the definition of the preliminary AOI, however, STSWG sees this process as being iterative. The scientific community is increasingly recognizing that episodic analyses are simply not productive and the analyses really need to be more seasonal in nature. Thus, this change in approach causes a change in tools, necessary data and analysis techniques.

Environmental/Public Interest Groups

- In response to a question about international cooperation, the international community will be invited to participate in this process. In fact, Canada did participate in the GCVTC.

- There is concern about the central role of this process within the overall responsibility of a State's air quality management process. There is nothing in the process that really changes the fact that the individual States are responsible for overall air quality management.

- There is a fundamental flaw in the process because it does not screen out the situations where the governor has the authority to reduce emissions within a given State before the whole RAMP process is implemented. There is no need to delay the process while the regional plan is developed when individual States have the authority to begin the reduction process immediately.

- Procedures should be formulated to encourage progress prior to completion of the planning process.

- Rural sources need to be included in this process.

- The preliminary AOI designation is very important. Three months is not sufficient time to adequately make this determination. If the planning area and process are too large, the procedure will not be productive or allow for a good regionally integrated plan. There needs to be proper guidance from the EPA on this process. There is a need for more definition of the RIP. It will need a considerable amount of work prior to reaching consensus on the concept.

- There are numerous situations that do not need this process. Using the whole lengthy drill in these situations is simply an attempt to delay. States that claim they cannot attain solely due to transport must demonstrate their claim to EPA.

- There is no need to sweep away current regulations that are effective in favor of this filibuster approach to implementing air quality management practices. Under the current CAA guidelines, there are prescriptive measures to ensure that EPA is improving the quality of the air. EPA needs to stick to the current approach which puts the onus on individual States.

- States should implement mandatory control options where they are obviously needed. There has to be technical uniformity in the methods used to identify individual AOIs; otherwise the debate will revert to "my model is better than your model."

- Under the current process, there is incentive for States to solve their own problems. These incentives are lacking in the RAMP process. The difference is that the current process lights the fire under States sooner as opposed to later, as is the case in the RAMP process.

Federal Agencies

- Apparently the Subcommittee does not want to lose emissions reductions while waiting for the new process to catch up. The reality of the matter is that if political jurisdictions fail to step up,

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then EPA will step in. The common goal is progress toward cleaner air, but meeting this goal will take time. The proposals are on the right track, and this method has to be better than the current 110(D)(2) method used with SIP calls. The guiding principle here is progress.

- This Subcommittee cannot realistically discuss ozone, fine particles, and regional haze without recognizing the impact of transport.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.4 Areas of Violation Boundaries

Discussed at February and August 1997 meetings.

Issue #1 What is the purpose behind defining AOV boundaries?

Issue #2 How should PM and ozone AOV boundaries be determined?

Issue #3 How should regional haze AOC boundaries be determined?

Issue #4 Should AOV boundaries be defined for individual pollutants, or should the boundaries encompass ozone and PM-2.5 violations and visibility impairment?

Issue #5 Who makes the initial AOV determinations?

Issue #6 How should the timing of AOV determinations be addressed, in the event that ozone and PM-2.5 designations are not simultaneous? Should ozone AOVs be determined first and then PM-2.5 and AOVs?

Background

Section 107 of the CAA required EPA to designate as nonattainment "any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutants." Designated nonattainment areas are subject to general nonattainment provisions that included making reasonable further progress, developing an emission inventory, providing for contingency measures if RFP was not achieved, and other requirements. Also, major new or modified sources in nonattainment areas must comply with the lowest achievable emission rate and must offset any emission increases by obtaining emission reductions from sources located in the nonattainment area.

Nonattainment areas traditionally have attempted to identify both the area in which a violation occurred and the area that caused or influenced the violation. This approach works when air pollution is generated locally. However, sources that contribute to violations are not necessarily located where the violation occurs. The traditional nonattainment approach does not address adequately violations in rural or remote areas with few or no significant sources.

To address broader transport issues that are relevant to ozone, PM-2.5, and regional haze, the Subcommittee decided to look separately at identifying AOVs, which are the areas violating the NAAQS, and determining AOIs, which are the geographic areas containing anthropogenic and natural sources that contribute to an AOV. The control regional is defined as an area within an AOI for which controls on PM, its precursors, and/or precursors of ozone are deemed necessary to meet the NAAQS or regional haze objectives. These distinctions allow the Subcommittee to look at transport

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while still addressing an area's ability to implement local controls as necessary.

Recommendations from the BPAPWG

The BPAPWG addressed the six key issues in considering the process by which AOV boundaries would be determined. The work group then made specific recommendations on the timing of AOV determinations and some general recommendations about how the boundary-setting process should proceed.

1. The purposes of defining AOV boundaries are to: 1) define where the population is being exposed to unhealthy air and educate the public on the estimated spatial extent of a NAAQS violation registered at a monitor so that people living in or near an AOV know about the violation and are informed of its health hazards; 2) judge progress toward attainment by measuring changes in the spatial extent of the violation; 3) define an area in which regulatory requirements apply; 4) initiate the regulatory process and expedite the planning process; 5) count and track where violations occur, which will generate air quality information and indicate trends over time; and 6) gather information that can be used to revise the layout of monitoring networks.

   AOVs should not be equated with control regions. The Presidential Directive mentions NSR and conformity in relation to nonattainment areas. However, it also states a goal of minimizing planning and regulatory burdens where air quality problems are regional, not local. The Subcommittee should continue to remind EPA of the problems in equating nonattainment areas with control regions.

2. The work group discussed four options for setting AOV boundaries: 1) provide no boundaries; 2) use existing political boundaries, such as counties, MSAs, Census blocks, or zip codes; 3) estimate the extent of the pollutant air mass that a monitor represented, assuming that the tools and data are available; and 4) use a zone approach, with black, gray, and white zones indicating improving air quality at increasing distances from a monitor, again assuming that tools and data are available.

   The work group decided that political boundaries and minimal analyses are sufficient for setting boundaries, that boundaries should be determined quickly, and that boundaries should be of minimal size. EPA should provide guidance on the criteria for determining boundaries.

3. In determining regional haze AOC boundaries, three options have been discussed: 1) split the United States into Eastern and Western regions; 2) use existing Class I areas boundaries; and 3) use Class I area boundaries, then group the Class I areas.

   The work group recommends that no new regional haze AOCs be established; they are already defined.

4. To address the issue of whether boundaries should be determined separately for individual pollutants or collectively for ozone, PM, and regional haze, the work group developed three options: 1) establish separate PM-2.5and ozone boundaries; 2) merge areas with overlapping PM-2.5 and ozone boundaries to include both the ozone area and the PM-2.5 area; or 3) establish a third area that is the intersection of ozone and PM-2.5 violation boundaries.

   The work group recommends that the purpose for merging AOVs be determined. Integrated analyses are needed so control measures for one pollutant do not exacerbate problems with another pollutant.

5. Options which have been discussed include: 1) EPA would initially determine AOVs, and States would be given the opportunity to comment, 2) States would initially determine AOVs with

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EPA comment and approval, and 3) Federal Land Managers (FLMs) would have a role in determining regional haze AOCs. Along with the initial determination of AOV boundaries is the issue of reviewing AOV boundaries. This should address when AOV boundaries are modified or expanded after initial determination.

6. AOVs initiate the planning process. This process should begin as soon as possible. Therefore, AOV boundaries should be determined quickly, and a lot of resources and time should not be spent drawing highly specific boundaries. Political boundaries and a minimal amount of analysis are sufficient for AOV boundaries.

Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments on the options and recommendations outlined by the work group at the August meeting.

States And Tribes

- Most of the issues and recommendations refer to States; Tribes should be mentioned as well.

- Concerns were raised about how areas that are in nonattainment under the old standard and areas that are designated as AOVs under the new standard will be reconciled so that there will not be two different systems.

- Questions were asked about spatial averaging and how the concept applies to determining AOVs. Suggestions have been made that spatial averaging supports an AOV designation concept, but the idea has not been pursued.

Industry

- The concepts of AOVs and AOIs are relevant and are not precluded by the Presidential Directive.

- Issues around AOVs need to be merged with discussions of AOIs. There are situations where an AOV will not be part of the AOI. It is inappropriate to define one without the other.

Environmental/Public Interest Groups

- The Presidential Directive said that the issues around AOVs are of little relevance. There is no support for the concept of AOVs in the Directive other than that they are an option to consider.

- From the standpoint of emission reductions, designating MSAs has been an effective way to establish controls in the past. If the Subcommittee moves to the AOV/AOI concept, environmental groups are being asked to give up on presumptive controls, which has never been tried. The environmental community has not heard a defensible reason for this giving up of controls. The idea of decoupling creates great concern.

- The implications of the transitional policy are that there are two categories. One category is in OTAG, which can implement regional measures, and areas have to sign up for their share of the requirements. In the second category, which applies under the AOV concept, those areas are off the hook from the beginning.

- While an EPA representative says that the process of setting AOVs and AOIs is designed to prevent poor decisions about items such as offsets or facility location, environmental representatives say that States in the past have chosen poorly. They have not been forced to make poor choices. Having States do no more than the minimum is not the policy direction to pursue. EPA can be very explicit in saying that States should look further outside of their boundaries.

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Local Goverments

- Nonattainment areas and AOVs seem quite similar. Questions were raised about how the boundaries of these areas may change in light of the new monitoring network and whether the discussion of monitoring locations has been tied into the discussion of AOV boundary-setting.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.5 Framework for Areas of Influence/ Areas of Violation (AOI/AOV): Responsibility for Reaching Attainment

Discussed at the October 1997 meeting.

Issue #1 Expediency and practicality have created inconsistencies in the application of the CAA dictate requiring nonattainment areas to include both the AOV and the AOI.

Issue #2 The present nonattainment classification does not differentiate between areas in measured violation and areas contributing to violations of the standards.

Issue #3 Specific controls are required within the nonattainment area, but limiting controls to the nonattainment area may not fully address the violation and encourages emissions growth just outside the nonattainment area border. Therefore, this approach does not address transport of pollution into a nonattainment area.

Issue #4 The current requirement for adoption of specified control measures for nonattainment areas has resulted in significant emission reductions and improved air quality. However, in some areas, specified measures either do not provide these benefits or are regarded as unreasonable.

Background

The additional time allowed by the CAA for development of SIPs to meet revised standards has raised the question of whether areas with measured violations should be required to adopt specific controls in advance of SIP completion. The Subcommittee developed the AOI/ AOV construct to address some of the issues arising under the existing approach.

Subcommittee work group papers proposed decoupling the AOV from the AOI. The RAMP/AOI issue indicates that the AOV should not necessarily be responsible for assuming the entire burden of emissions reductions to mitigate the violation; an AOV designation should not carry with it automatic control requirements. Once the AOI has been determined through an appropriate analysis, the AOI would be responsible for the emissions reductions necessary to bring the AOV into attainment.

Although the Subcommittee generally agrees that separating the identification of the AOV from the more expansive AOI makes sense, the work group proposals to eliminate specific control and administrative requirements for AOVs have raised concerns that adoption of reasonable control measures might be inappropriately delayed. An ad hoc group was formed to move forward on resolving the issue of decoupling requirements from violations and to address the different timeframes incorporated in the different approaches.

This paper proposes to find middle ground between the default control measures approach of the 1990 CAAA and the earliest drafts of the AOI/AOV construct

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which decouples the control obligation from the AOI, with potential for delay in adopting control measures.

Recommendations from the Ad Hoc Group

The ad hoc group recommends the following approach for adoption of control measures in AOVs:

1. EPA, in consultation with interested stakeholders, would prepare a comprehensive list of control measures that are recognized as generally effective in achieving emissions reductions in AOVs.

2. Each AOV would be required to adopt NSR and a selection of control measures from the EPA menu of available measures. No particular measures would be required, but enough measures to achieve a specified minimum percentage would be required.

3. The AOV would be required to implement control measures equal to the specified percentage unless it could be demonstrated that it is impossible to achieve the percentage with reasonable measures in relation to the AOVs particular problem or condition. The exemption criteria should be designed so that the process does not depend on an elaborate analysis.

4. Areas should have flexibility to terminate a measure in the future if it is no longer needed.

Discussion by the Subcommittee

There was no discussion immediately following the ad hoc committee's presentation at the October meeting. However, there was a response at that meeting by the STSWG expressing concerns over the framework AOI/AOV recommendations. The following summary reflects selected comments made by Subcommittee members after the STSWG response. These comments address both the ad hoc committee's presentation and STSWG's concerns.

States and Tribes

- A lack of confidence in the effectiveness of control measures, not a lack of political will, takes incentives out of early reduction programs. The same is true for the ability of nonattainment areas to choose reduction strategies without using science. There is no streamlined process, as the proposed reduction measures list indicates.

- The proposed list will not prescribe a standardized national percentage. For example, if an area demonstrates that a percentage will not be achievable due to the aggressiveness of existing controls, the approach will flip the current AOI/AOV approach by allowing presumptions where national reductions are not appropriate.

- The presumptive target of the proposed list will be expected to provide a meaningful reduction as an initial step, but it is not intended to be a priming activity. The process will be based on a proposed EPA list and percentages providing a target with significant reductions.

- The proposed list is comparable to California's flexible agreement. The problem is if this proposal results in a less aggressive SIP, which is not attractive as an incentive. Monitoring and modeling are important, and the opportunity for a lesser SIP is not a compelling argument.

- The proposed measure must be flexible to assure local buy-in, otherwise it is a mandate. Also, it is not clear how the proposed concept applies to a transitional classification. In addition, the question of when programs can be

implemented needs to be answered. Not many local areas will want to move forward on PM-fine since EPA will be re-evaluating the standard during the transitional period. The response is that the legalities have been established prior to designation under Section 107(d).

- Modeling and science are extremely important. It is a matter of degree and every situation is unique; we cannot compromise on science. EPA should develop a list consistent with the Presidential Directive of July 1997. States then will have an opportunity to look at the list and determine costs. It is important to look at science early in the decision making process.

Industry

- The measures are for places that achieve the 1-hour standard but not the 8-hour standard. There is confusion over how an area can pick and choose a strategy without science.

- The judgement of nonattainment areas to choose effective options is in question if this judgement resulted in an area being in nonattainment in the first place.

- Doubt exists over the existence of effective prescriptive measures. When discussing AOI/AOV measures, there needs to be a mechanism that provides a strategy for solving the transport problem.

- Industry has questions over the benefit of the proposed approach over the transitional program for ozone nonattainment areas; the transitional program and the pending NO_x program are supported by more science. AOVs where transport is the cause should be exempt. For those areas with their first designation, it is questioned whether they will have sufficient knowledge to demonstrate transport. This approach cannot be supported as a mandatory part of the program. Also, concern exists about PM-fine AOVs that are confined to a specific geographic area, suggesting that those areas may not be a FACA Subcommittee issue.

- Concern exists about the effects that decoupling AOVs and AOIs will have on areas most affected by transport. Too many questions remain to support decoupling at this time. A proposal that includes a degree of accountability for the AOV is necessary.

- Flexibility of the proposal is supported. Speciation data are needed to make effective recommendations in metropolitan areas. Monitoring of major sources in rural areas, such as agricultural burning, is needed.

Environmental/Public Interest Groups

- There are areas where violations can be resolved with a certain strategy and there will be no need to complete a complicated SIP analysis. It may work well in some of the new areas. Smaller areas do not have the money or sophistication to perform analysis and modeling. The exemption criterion exists to protect areas where the proposed approach does not make sense.

- The opportunity to reduce emission levels early should not be postponed just because additional measures might be needed later. If delayed, they may not see reductions for 15 or 20 years. Early is good, especially in the context of PM-2.5.

- How much science is enough? Does EPA have enough science to answer the basic questions relating to the issues being discussed? Multiple media need to be more of an issue. All pollutants have multiple effects, and there will be trade-offs between controls. Some choices will be social rather than scientific.

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Academia

- While supporting the AOI/AOV concept and its scientific basis, three assertions in the issue paper need to be challenged:

  1. The competency of asserting causes *a priori* is low based on scientific knowledge.

  2. The fairness of asserting that a governmental body is responsible for solving a problem that it did not cause, while not providing for the real identification of the problem, is an issue.

  3. Acting on incorrect assumptions of the causes of violations is inefficient economically and delays finding the problem's solution.

- There are concerns over the process making the situation worse rather than better if EPA does not take advantage of known science.

- There is a question of whether this concept will apply more to PM-2.5 designations than to ozone, because of transitional classifications. The response is that it will apply to any pollutant.

- There are concern that the measures are prescriptive and that trading should be considered as a measure. The response is that the measures are a starting point, and that States can look at the relative effectiveness of controls and make substitutions as necessary. The list of measures may be different for each pollutant depending on the nature of the problem.

- The assumption has been made that this is an attainment proposal and it is not. It assumes that there is experience in identifying air quality problems. The list of measures will not be an indicator of reductions, rather, it will be a measure of emission reductions.

- In response to doubts over the existence of the knowledge necessary to enable planners to make correct judgements, the process will not begin until monitors are deployed and a violation is detected. Science and knowledge will be applied in making initial efforts. This is not a strategy to attain the standards but will be used to realize reductions.

- Incentives to avoid a nonattainment designation remain, and there is no need to add this structure when EPA can provide control technology lists.

Federal Agencies

- Agreement exists with the States that modeling and analytical information are critical for the planning process to proceed effectively.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.6 Options For Designating PM-fine Areas

Discussed at October and November 1996 meetings.

Issue #1 How will the requirement for 3 years of PM-2.5 data affect the Subcommittee's desire to identify integrated control strategies for ozone, PM-2.5, and regional haze? Is it important for them to be on the same schedule, or should we rethink our recommendation that only monitoring data be used to designate PM-2.5 areas?

Issue #2 Should ozone designations be delayed so that the planning process for ozone and PM-2.5 will be synchronized?

Issue #3 Is the use of monitoring data still a critical issue as we move from the current air quality management structure approach to the AOV/AOI approach?

Background

The EPA's proposed revisions to the NAAQS for PM include a new standard for fine particulate matter, which is defined as PM with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (PM-2.5). The EPA could approach ambient data requirements for the new standard in the same manner as for the PM-10 standards, with 3 years of ambient data needed to determine whether areas are attaining the new NAAQS. The most recent version of the issue paper on Options for Designating PM-fine Areas was prepared by the EPA staff and made available to the Subcommittee on November 12, 1996.

Previous option papers circulated among FACA work groups dealt with PM-fine designation, notably the July 25, 1996, joint option paper prepared by BPAPWG, NRSWG, and STSWG. This paper discussed the designation issue in great detail and should be referred to for a full understanding of the AOV concept that will be referred to later in this paper. Briefly, AOVs describe those areas in which violations of the standard are observed and AOIs describe those areas that potentially contribute to violations. The AOV is the entire area not meeting the ambient air quality standard. The AOI would be designated based on scientific data, identifying the area that contains sources that potentially contribute to the exceedance of the ambient standards in the associated AOV.

There was disagreement among Subcommittee members regarding the use of a statistical approach to predict PM-2.5 concentrations. Several of the environmental Subcommittee members strongly supported using a statistical approach to predict PM-2.5 concentrations from a ratio of PM-2.5 to PM-10. However, other members conveyed their strong preference for using 3 years of ambient monitoring data rather than a statistical approach. Their concerns stemmed from EPA's decision in 1987 to use a similar approach for the PM-10 NAAQS, and was based on the uncertainties associated with the statistical approach and the resulting designations for PM-10. Some areas were designated PM-10 nonattainment based on the statistical probability approach even though they never violated the NAAQS, while other areas with low probabilities subsequently violated the standard, but were not initially designated nonattainment. Other concerns with using a statistical approach for PM-2.5 are its regional nature, the potentially large secondary component, and its seasonal variability compared to PM-10 concentrations.

There are fundamental CAA requirements tied to designations. For example, once a NAAQS is promulgated, EPA must designate areas nonattainment that do not meet the new NAAQS within 3 years. It would take time to develop a monitoring method, build monitors, and deploy them across the country. Also, EPA had no Federally endorsed method for monitoring PM-2.5. Adequate funds are not expected to be available to build and deploy an extensive network of monitors that EPA ideally would like to see, at least not within the 3 years EPA has under the CAA to make designations.

Recommendations from EPA Staff

In an earlier draft of this paper, EPA presented nine options for designating PM-fine areas. Based on comments received on that draft and discussions of the Subcommittee at its October meeting, EPA narrowed its list to two options. These two options were presented at the November 1996 meeting.

1. Rolling Method. Preliminary designation at promulgation of the new NAAQS would be based on all available information. As soon as 2 years of data are available from the sites EPA

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had targeted first because of high population exposure, an interim designation of either attainment or nonattainment could be made. Areas would receive final designations after they gathered 3 years of data. An interim nonattainment designation would mean that control strategy planning must begin immediately. As more sites come online, this process could continue to roll. For other areas where sufficient data would not be available by June 2000, the statutory deadline for designations, the preliminary designation made upon promulgation of the new NAAQS would remain in force until at least 2 years of monitoring data were available to make an interim designation. Once these areas had gathered 3 years of data, final designations could be made.

Factors that favored this approach included the ability to make decisions based on monitoring data, satisfaction of the CAA requirement to designate within 3 years, no delays in control strategy development, and the provision of monitoring incentives. Arguments against this option include the introduction of a new interim status concept based on only 2 years of data, which may be challenged on legal grounds and would not be as stable and accurate as an estimate based on 3 years of data, and the possibility that control strategy development might be misdirected.

2. Early Response Method. This method uses statistical probability or another approach to determine areas that have a high probability of violating the standards. Those areas would be selected for accelerated monitoring, which would include 1 year of PM-2.5 monitoring augmented with speciated monitoring. At the end of 1 year, if the monitoring data show a violation, a nonattainment or AOV designation would be made. The area would initiate planning linked to a time-certain end point for all areas independent of the year of the AOV designation. For areas determined to be neither high probability nor included in early response, EPA could establish exceedance criteria based on 1 year of monitoring data that would then trigger early response monitoring in the second year. A time-certain attainment date could be an incentive for early monitoring.

Factors favoring this approach were early action for areas with the worst air quality and prompt response to public health concerns, early speciation to speed the planning process, no penalty or disincentive for early detection and response, reliance on monitoring data for redesignation, and satisfaction of CAA time requirements. Factors working against this approach were time-certain attainment dates that might not be consistent with the CAA, no early response from AOVs not initially determined to be high probability, and the possibility of errors in probability-based selections.

Based on the Subcommittee discussions that followed the presentation of the PM-fine issue paper on November 19, the presentation was revised and the following proposed principles were finalized on November 21.

- The PM-2.5 monitoring program will fail without adequate financial and management support.
- Speciated monitoring data should be required to assist in planning and control program design.
- The designations process must be completed no later than 3 years.
- The planning process should begin as soon as possible as data indicates.
- More frequent monitoring should be considered.
- Areas with sufficient data shall be designated as soon as possible after promulgation of the NAAQS.

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Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments on the issue paper.

States and Tribes

- The rolling method might prove to be a disincentive for monitoring.
- Costs of additional monitoring and the source of funds to pay for it were not addressed.
- The labor and manpower necessary to collect the data and analyze them properly should be considered. Data collection is an intensive process with no new monies put on the table.
- It is not clear whether NSR, least achievable emission rate (LAER), and offsets will be operational during the interim period.
- States could move forward on the development of SIPs during the data gathering period.
- The real question is when the the planning process should start.
- Both monitoring and ratio techniques would be needed to meet the goals of this initiative.
- If a State has 3 years of data that show there are no exceedances, the State should not have to submit maintenance plans or go through redesignation but should be deemed to be in attainment.

Industry

- All available data should be used to make designations.
- An analysis of the funding, analytical, and administrative requirements for implementing the monitoring program is needed.
- An important issue is the risk of designating areas based on limited data. One way to reduce the risk is to run the data through an extreme value analysis.
- A monitor could be deployed early, the frequency of monitoring increased to weekly or daily for a year, and the top 10 percent of data readings speciated. If a problem is identified, then the high-frequency monitoring can be discontinued while a control strategy is developed.
- Sampling methods often affected the quality of data; nephelometry is at best a stretch when considering PM-fine concentrations.
- The planning process should be initiated early in the measurement process, but there is a problem with the concept of initiating controls at the same time.

Environmental/Public Interest Groups

- Early designations should be required for areas that have a high probability of violating the NAAQS.
- Areas should be designated at the earliest possible date, using existing data whenever possible.
- Speciation of data should be used in conjunction with planning and control requirements.
- Speciated data should not be a precondition for controls.
- Environmental groups strongly support early controls during the designation process and prior to SIP adoption.

Academia

- The data issue is not a function of science limitations but rather a func-

tion of management fallacies. The technologies are available to gather data and the means are available to analyze the data. To add 500 monitors would cost $5 million dollars annually, which is not a significant amount of money.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.7 Attainment Dates for New National Ambient Air Quality Standards (NAAQS)

Discussed at September 1996, November 1996, and October 1997 meetings.

Issue #1 What dates or timeframes should be established for attaining new NAAQS?

Issue #2 What should trigger the planning process?

Issue #3 How can an attainment date recommendation take into consideration an integrated approach to the new NAAQS and regional haze rules?

Issue #4 Should the attainment date recommendation take into consideration potential public expectations, such as a shorter attainment date that may result in failure to attain compared to a longer date with greater likelihood of attainment at the end?

Issue #5 Should the attainment date recommendation consider the relative costs and benefits of a shorter attainment date with potentially less assurance of attainment compared to a longer attainment date with greater likelihood of attainment at the end?

Background

The attainment date requirement for NAAQS was established in the 1977 CAA. The deadline for all primary NAAQS was set for December 31, 1982 (5 years after enactment, with an allowance of a 5-year extension for ozone and carbon monoxide). The 1990 amendments revised the deadlines and added new deadlines for ozone and PM-10. Current requirements dictate attainment for all primary NAAQS within 5 years of designation to nonattainment, with provisions for extensions. Requirements and extension provisions for ozone are set on a classification scheme that establishes attainment dates based on an area's respective classification (moderate to serious).

The visibility protection provision in Sections 169A and 169B of the CAA establish the framework for the regional haze rule. Section 169A declares the national visibility goal as "the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." Although these provisions do not establish a regional haze standard or attainment date, they do require EPA to promulgate regulations to ensure "reasonable progress toward meeting the national goal."

Recommendations from the BPAPWG

The BPAPWG initially developed three major recommendations.

1. EPA should have flexible attainment dates using 10-year planning cycles that contain RFP targets and planned emissions reductions. Under this approach, States would submit a SPIP for each AOV. The SPIP would address the goal of achieving attainment as expeditiously as practicable and would include a date for achieving attainment. If attainment cannot be achieved, the SPIP would establish

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reasonable progress targets and emissions reductions that would move the area toward attainment.

2. Nonattainment areas would be eligible for successive planning cycles if they could demonstrate that they had met the planned level of emissions reductions, milestone requirements, and controls for the nonattainment area. If the area had failed to meet the milestone requirements and implement the SPIP controls, certain additional requirements might be established. During each planning cycle, a mid-cycle evaluation would be conducted to determine whether the area was meeting its milestones and planned emission reductions and moving towards attainment. Interim adjustments could be implemented if the plans were not moving the area toward attainment.

3. Incentives to encourage early attainment or emission reductions should be a part of the new attainment date approach. At a minimum, a "safe harbor" provision would allow areas implementing programs for early attainment or early reductions adequate time for these programs to work. Additionally, these areas would not be required to implement new programs until the next planning cycle.

At the November 19, 1996, Subcommittee meeting, the work group proposed that they delay their attainment dates recommendation to Phase II, because they needed to know at what levels the proposed standards would be set before proceeding. In the interim period, the work group offered the following concepts and principles to be considered by the Subcommittee for inclusion in the Phase II report:

- Date certain as the driver
- Interim dates (due dates for planning process elements)
- AOV/AOI approach
- Reasonable planning cycle
- Timing of initiation of planning process
- Flexibility
- Scaled/targeted consequences
- Targeted RFP - reductions of ambient levels
- Planned emissions reductions
- Achievability (stringency) of standards
- Eligibility criteria for flexibility
- Contingency measures
- Mid-cycle reviews and adjustments
- Incentives (safe harbor) - early attainment/reductions
- End-of-cycle review, assessment and future planning
- Integration of approach to new NAAQS/regional haze
- Public expectations
- Cost/benefits
- Transport
- Meteorological conditions (e.g., variability, natural events policy, international transport).

Final attainment dates recommendations were developed based on the work of an ad hoc group of the BPAPWG and an analysis of the Presidential Directive. Key ad hoc group principles are:

- Date certain as a driver
- Specific interim dates for planning, implementation, and assessment
- Reasonable planning cycle
- Flexibility
- Scaled or targeted consequences
- Incentives for early attainment.

Under the Presidential Directive, attainment schedules in the CAA will be followed for new standards, and ozone transitional areas will assess their strategies in 2007.

The ad hoc group's recommendations are:

1. All areas should have a presumptive attainment date of up to 5 years from the date of designation.

2. Upon submission of its SIP, an area could ask EPA for an extension of up to 5 years. EPA could grant these longer attainment dates based on defined criteria.

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3. A 3-year assessment should occur subsequent to the 5-year presumptive attainment date, followed by 10 years of maintaining the NAAQS.

4. The two 1-year extensions may not apply to new concentration-based standards. Guidance from EPA is needed in this area.

5. Section 179(d) sufficiently addresses actions for responding to an area's failure to attain.

6. There is still a question about how to address areas that cannot demonstrate attainment.

Discussion by the Subcommittee

The summary below includes selected comments of the Subcommittee on the original three recommendations and the list of concepts and principles outlined by the work group at the November 1996 meeting.

States and Tribes

- The report does not represent consensus among the work group members, the paper may have missed some important steps, and a revised paper should include more options and specific proposals.

- The idea of adding flexibility with scale-targeted consequences to the nonattainment concept while ensuring that deadlines were set and EPA had appropriate tools for accountability and sanctions had considerable appeal.

- Progress could be made when local areas felt that they were a part of the planning process.

Industry

- The paper offered flexibility to make the dates achievable and distinguished between areas that tried and failed versus areas that failed to try. However, while noting that there could be groups that put forth a good effort and failed for reasons beyond their control, no guidance was offered on how EPA would determine whether an area was truly making a good-faith effort.

- Certain date as a driver was useful only if the date was set after the end of the planning process.

- Regional haze issues, particularly a long-term review of progress, needed to be added because regional haze would not have date certain as its driver.

Environmental/Public Interest Groups

- There is strong opposition to the idea of eliminating attainment dates, which were fundamental to air programs; certain dates were needed to promote action and drive programs.

- While flexibility is valuable, there must be accountability for failure to meet prescribed goals, with part of the planning process to include the identification of specific air quality improvement objectives between now and the implementation date. The concepts of flexibility and extension of attainment dates appeared inconsistent with the certain date concept.

Federal Agencies

- Information on planning cycles and targets was needed to clarify how the absence of attainment dates would affect the ozone and PM programs.

- Following is a summary of comments from the Subcommittee members at the October 1997 meeting.

States and Tribes

- It makes sense to plan for more time up front. States asked what the expecta-

tions will be for the second 5-year period. The response was that the original plan allows for a request of five additional years during initial SIP submittal.

- All classifications should be made at the same time for PM-2.5. A suggestion was made to include the use of the State of California concept of defining measures up front by getting reduction commitments from identified sources.

- The exceedance-based form of the standard allows for the possibility of two 1-year extensions. Does this apply to both PM and ozone? The response is yes.

- Section 182(e)(5) measures may fall under subpart 2 rather than subpart 1. Subpart 2 is more flexible. Los Angeles probably will be the only area that will qualify. States and Tribes need to know the ground rules for the two 1-year extensions. The EPA reply is that guidance will need to address this issue.

Industry

- The concept of a front-loaded attainment strategy is inconsistent with the attainment paper.

- There are areas that will have trouble attaining the NAAQS, which is why the Section 179(d) provision from the CAA is included. There is no mechanism to address this situation for either pollutant.

Environmental/Public Interest Groups

- The original document states that the presumptive attainment date needs to be set "as expeditiously as practicable." These words need to be added to the recommendations and should be consistent with the law.

- There is a question over whether the full Subcommittee has endorsed these recommendations. EPA will review previous minutes. The agreed-upon Subcommittee principles may indicate agreement by the full Subcommittee.

- There is concern about safe harbors and rewards for timely planning. A State can automatically qualify for a time extension simply by completing its plan on time, even though its plan may overestimate reductions and subsequently fail, thereby giving it additional time to develop another plan.

- Another concern is the 3-year assessment period. This would give an area 8 years before the determination about attainment status is made. Assessments should be conducted within the 5-year timeframe.

- A request during SIP submittal for a 5-year extension is reasonable. However, it should be understood that the 10-year total does not give license to defer expeditious action or delay putting controls in place.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.8 Monitoring Incentives

Discussed at July and October 1996, February, June, and August 1997 meetings.

Issue #1 How can incentives be created for monitoring?

Issue #2 How can incentives be created for private-sector/regulator monitoring partnerships?

Background

There is a general reluctance among State and local governments and businesses to monitor ambient air quality beyond the minimum requirements contained in regulations promulgated by EPA in

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40 CFR Part 58. The reluctance is based in part on the fact that areas are designated as nonattainment where monitoring shows violations of the NAAQS and are classified according to the seriousness of the air pollution problem. Currently, nonattainment designation and classification automatically trigger State implementation attainment planning and demonstration requirements, potential stationary and mobile source emission controls, nonattainment New Source Review for sources wanting to locate or expand in the new nonattainment area, and possibly additional requirements relating to nonattainment of the NAAQS. Thus, the current regulatory system results in a disincentive for detecting violations.

Recommendations from the BPAPWG

The BPAPWG presented two options at the February meeting.

Option 1. Promote incentives for monitoring and improve the current monitoring network by appointing a national task force, consisting of representatives of the FACA Subcommittee and other interested organizations. The task force would be charged with developing policy and technical guidelines for air quality monitoring that would be used to develop implementation programs to attain the NAAQS.

Option 2. Provide no incentives for additional monitoring. Rather, have EPA adopt national guidelines, specifying the minimum number of monitors for each NAAQS pollutant in each MSA, SMSA, or similar area of reference. Each State should be required to submit a monitoring SIP that provides for establishment and operation of a monitoring network meeting EPA guidelines.

Following this presentation, an Ad Hoc Group on Monitoring Incentives was formed. The Ad Hoc Group presented two sets of recommendations at the August 1997 meeting, as shown below.

Recommendations 1 through 5 are the final consensus recommendations of the Ad Hoc Group on Monitoring Incentives.

1. Provide financial incentives by revising EPA guidance to allow the use of Title V funds for general ambient air monitoring at NAMS, SLAMS, PAMS, and certain special purpose monitors.

2. Expand mandatory national ambient monitoring requirements through rulemaking and provide commensurate funding or funding mechanisms to support the new activities.

3. To ensure that focused control strategies are implemented in the appropriate areas, allow the use of both public and private monitoring data to clarify area boundaries and to analyze the chemical makeup of particulate matter.

4. Encourage the formation of public-private partnerships to expand ambient monitoring from health-based organizations (e.g., health maintenance organizations) environmental groups, private foundations, industry, FLMs, and Supplemental Environmental Projects.

5. Accelerate implementation of PM-2.5 monitors to improve the information base upon which initial designations will be made.

Recommendations 6 through 11 are considered limited consensus recommendations of the Ad Hoc Group. General support was obtained from State and industry representatives, but not from the environmental/ public health community.

6. Redefine the immediate link between a measured violation and mandatory nonattainment regulatory provisions. This approach would need to be com-

patible with the AOI/AOV concepts currently under consideration.

7. Allow the use of realistic inputs instead of defaults where appropriate for modeling assumptions once an area has installed all the monitors required for the new network. When a source is required to model and creates the inputs for the model, it is important that sufficient data for inputs be available to provide the most accurate outputs.

8. When possible, locate monitors in the areas of highest population, especially near buildings where people live. Similar to the proposed changes to 40 CFR 58 for PM-2.5, requirements should consider population density when siting monitors to evaluate public health impacts.

9. Require Federally-referenced continuous and instantaneous-reading monitors for 24-hour PM sampling when episodic control strategies are employed; such instrumentation should be encouraged to support other uses such as public reporting.

10. Initiate a national voluntary partnership program for specific selected sources in lieu of command-and-control requirements. Partnerships with the private sector would include requirements for both emissions and ambient monitoring.

11. Decouple research monitors from the designation process.

Discussion by the Subcommittee

Following is a summary of selected comments from Subcommittee members at the February 1997 meeting.

States and Tribes

- Reasons why more monitoring is not done routinely include lack of money and the disincentive/linkage issue.

- There needs to be flexibility in implementing expanded programs. States should be free to pursue fees to support air monitoring; Title V fees to help support monitoring could be key.

- The need for incentives is seriously questioned. Monitoring data are generally accepted as truth. The public relies on these data to tell them what they are breathing. The public wants more monitors, and the main impediment is a lack of funding.

- The work group should produce a one-page summary so that the Subcommittee can discuss all of the recommendations together.

- In response to a comment concerning the wisdom of the decoupling recommendation, the larger issue is the automatic, prescriptive procedures that come with designation. It is not the act of designation for the area of violation, based on the location and siting of a monitor.

- The work group needs to determine the level of monitoring that is necessary to support the protection of the public health and environmental welfare. Then EPA and the States need to invest whatever it takes to support that level of monitoring.

Industry

- If Title V funds are not available for monitoring then States should be able to charge fees for monitoring. States should be given as much flexibility as possible when implementing monitoring programs.

- An important issue for the Subcommittee is to provide incentives to increase industry participation.

- There is a need for more credits and other economic mechanisms to deal

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with fees. The Subcommittee needs to get more people from the private sector to support monitoring. Additionally, there needs to be some degree of support from the fee programs; it does not need to be limited to Title V fees. There is not a consensus on using Title V fees to fund monitoring programs; rather, if Title V funds are available, they could be used for monitoring. Perhaps EPA needs a budget increase, because good monitoring data are the foundation for everything that the Subcommittee is attempting to do.

- As of now, monitoring is highly focused on urban areas. According to STAPPA/ALAPCO, 88 percent of emissions leading to PM-2.5 come from rural sources. It is necessary to increase rural monitoring networks.

- Title V is concerned only with stationary source problems and there are many categories not included in Title V. There needs to be a way to apportion the costs across the other source categories relative to their contribution to emissions inventories. It is not appropriate to raise Title V fees every time there is a need for additional monitoring.

- There needs to be more attention paid to the Federal Reference Method and all the siting issues associated with it. The work group should elevate this issue to a higher priority. Additionally, the FRM should not disregard existing monitoring information.

- Research-grade monitoring needs to be a consideration. There should also be discussion of using inspection and maintenance funds as a means of evening out the playing surface. There are other Federal agencies that are monitoring and measuring (e.g., NOAA). To provide the necessary data, there needs to be surface and upper air monitoring as well as source monitoring.

- The concept of decoupling monitoring from the AOV is important. The Subcommittee needs a better understanding of this issue before trying to reach closure on monitoring.

- There is a need for more monitors and they are needed now. Mechanisms exist to get the funding; it is simply necessary to communicate the needs and benefits adequately to the public.

Environmental/Public Interest Groups

- It appears to be the general opinion behind the decoupling recommendations that regulators frequently find instances where monitors are measuring nonexistent problems. This does not seem to be fundamentally correct.

- Incentives for monitoring may be created over the next year or so to support decisions related to the development and definition of control regions.

- Emission reduction measures used during the interim planning period must be both measurable and enforceable.

Academia

- Issues related to the placement of monitors and their associated linkage to cost are important. Network design needs to be considered. It is necessary to plan monitoring requirements with an understanding of the network needs. A review of the network design for all monitoring is recommended. If that is done, some economies of scale can be discovered among neighboring States that will help to alleviate some cost concerns.

- There is a presumption that in the new implementation plan there will be a lot of undesirable inflexibilities. The idea here is to remove as many of these disincentives as possible.

- The discussion seems to support the need for developing plans to better design

monitoring networks and reduce monitoring costs.

Federal Agencies

- When considering issues of funding and incentives for monitoring, it is also important to consider secondary standards, regional haze, and other violations that could be defined within the concept of monitoring an AOV. The issue goes beyond the traditional requirements of monitoring.

- Using Title V fees as an alternative for funding monitoring should not be a long-term solution. In the past Title V fees have been restricted to the implementation of Title V activities, and industry has been quite hostile to using these fees in any other manner. Current Title V fees are inadequate to cover program requirements, so fees would have to be increased to fund additional efforts. In some States, Title V fees are substantially less than anticipated, and it will be difficult to get States to increase Title V fees.

- The work group addressed three issues: costs, technical items, and data usage. Data usage is the most important concept.

- States need to look at short-term efforts to get more money for monitoring. It does not appear that the amount of money needed is that large. There is a need for basic information to be delivered at both the State and Federal levels. It will be important for everyone involved to lobby for additional monitoring funds. There is a need for consensus that more monitors are good and necessary.

The recommendations presented to the Subcommittee at the August 1997 meeting are the final work of the Ad Hoc Group on Monitoring Incentives. Although the recommendations do not directly address the Presidential Directive, the group notes that the Directive raises issues related to decoupling, transitional classifications, a moratorium on PM data, and the number of years of data required for designation, all of which may affect monitoring incentives. There were no comments from Subcommittee members at the August meeting.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.9 Classifying Areas in Violation of the New Air Quality Standards

Discussed at February and October 1997 meetings.

[Official Name: *Classifications of Designated Areas Under New NAAQS*]

Issue #1	Should the current approach to classification be retained?
Issue #2	Should there be a two-tiered approach to classification?
Issue #3	Should areas be classified specifically to address regional transport?
Issue #4	Should areas be classified to emphasize differences between AOIs and AOVs?
Issue #5	Should areas close to nonattainment be classified?
Issue #6	Should large AOI's be subdivided in different control regions each with its own classification?
Issue #7	Should classifications be made to identify core requirements?
Issue #8	Should there be no classifications?

Background

The classification system is a significant addition to the plan requirements for

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nonattainment areas under the 1990 Amendments to the CAA. One of its purposes is to establish similar requirements for nonattainment areas experiencing similar problems, thereby leveling the playing field among otherwise diverse political jurisdictions. Another purpose is to make a statement about the severity of the air quality problem in a way that is readily understandable to the public. For example, it is clear that a severe ozone nonattainment area has a more significant air quality problem than a moderate nonattainment area.

One of the major criticisms of classifications is their inherent absence of flexibility in addressing local problems. While virtually every SIP developed under the CAA has had area-specific measures available to it for addressing local problems, generally there has been an accompanying core of prescribed planning requirements that include SIP due dates, rates of progress for emission reductions, and attainment dates. Another criticism of the current system is that it may create a sense of complacency. That is, when a classification has included a relatively distant attainment date, there may be a tendency to ignore the "expeditiously as practicable" language in the CAA and assume that attainment can be delayed until the final date. Then, if attainment does not occur by that date, the area need only "bump up" to the next classification and receive a new, more distant attainment date. The opposite side to the attainment date problem has to do with prescribing a one-size-fits-all date for attainment that may be impossible to meet, notwithstanding best efforts to comply with the date.

The classification system concept may continue to have value as the new NAAQS are implemented if it preserves a measure of consistency and at the same time strikes the appropriate balance between prescription and flexibility in the planning process and helps the general public to understand the significance of the problem. Title I, Part D, Subpart 1 of the CAA establishes the general basis for classifications, once an area is designated as a nonattainment area. Accordingly, the Administrator may classify an area for the purpose of applying an attainment date and for other purposes. In determining the appropriate classification, the Administrator may consider such factors as the severity of the nonattainment problem and the availability and feasibility of pollution control measures. The language used in this section of the CAA suggests that these factors are not necessarily the exclusive ones which may be considered in classifying areas. Thus, there appears to be flexibility, both in terms of the decision whether or not to use a classification system and in the factors used for assigning classifications.

There is a new opportunity to consider the general classification factors in Subpart 1, in light of the proposed new standards for ozone and fine particulates and the regional transport problems that may need to be addressed under the new standards. These factors include applying an attainment date, severity of the nonattainment problem, availability and feasibility of pollution control measures, as well as the need for innovative classification systems to address regional transport problems. To arrive at a policy decision on classifications under the new NAAQS, it is important first to define the possible goals of a classification system. If there are no inherent advantages to classifying areas, then there is no point in developing classifications. Classification goals include consistency, education, hierarchy, bump up, complexity, and integrated planning.

The Subcommittee and work groups have been moving away from the traditional nonattainment area approach to air quality problems and toward promotion of a system involving AOVs and AOIs. An AOV is the area where exceedances of the NAAQS are recorded, but not necessarily the area targeted by attainment plans and emission controls. The AOI is the area containing

the sources of emissions which cause the exceedances in the AOV. The AOI therefore is subject to the planning and control requirements to improve air quality. A classification system based on other factors may best fit this new AOI/AOV approach.

Recommendations from the BPAPWG

The following selected recommendations were made by the BPAPWG at the October 1997 Subcommittee meeting:

1. Classifications for PM-2.5: Designing a PM-2.5 classification scheme is premature until the outcome of the standard review process is known and more PM-2.5 data are available. This does not mean that areas should wait until after the standard review process has been completed to analyze their PM-2.5 data. Areas should examine their PM-2.5 data as they become available. If nonattainment areas can be grouped according to similar problems and requirements, classifications could be used to form these groups.

2. Classifications for Ozone: No additional ozone classifications for the 8-hour standard should be established beyond the transitional classifications established by the Presidential Directive for areas that: 1) attain the 1-hour standard or will attain the 1-hour standard by 2000; and 2) participate in the regional NO_x strategy or achieve emissions reductions on the same schedule as the regional strategy.

3. Classifications to Establish Attainment Dates: Classifications should not be used to facilitate the establishment of attainment dates for the 8-hour ozone standard. Work group members generally agree that the attainment date should be established based on the complexity of an area's air pollution problem (i.e., overwhelmingly caused by transport, transported plus local emissions, or local emissions) and the area's success at planning and implementing a control strategy.

4. Classifications to Differentiate Planning and Control Requirements: Classifications should not be used to differentiate planning and control requirements from one area to another. Work group members generally agree that States and local air quality agencies should be given the maximum flexibility to develop control strategies that make sense for their areas. A classification scheme designed to prescribe planning and control requirements would limit flexibility.

5. Classifications to Inform the Public of Unhealthy Levels of Air Pollution: Classification is not an effective mechanism for communicating to the public the health risks associated with air pollution. Classifications are established once and do not represent real-time air quality data. The work group agrees that the Pollutant Standards Index (PSI) and programs such as ozone action days more effectively communicate risk levels to the public.

Discussion by the Subcommittee

Below are highlights of selected Subcommittee comments from the October 1997 meeting.

Industry

- The public knows nothing about classification schemes of attainment or nonattainment. There are more effective ways to communicate to the public. The present scheme of classification is not effective.

- There is a need to delay the classification system until more data are available on PM-2.5.

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Environmental/Public Interest Groups

- There is concern about the delay in the classification recommendation. The issue paper does not deal with an aggregate by region, year, etc.

- A review is pending for PM, so there is no good reason to delay classification for PM-2.5. Do not rule out other options for using the data being collected. The classification scheme can be updated more regularly or can supplement the PSI in informing the public. There is value in having a comparative guide to give to the public.

- A distinction can be made between labeling and classification systems. Labeling is useful and can educate the public. The work group should not be bound by the old definition of classification, and they can use another term. Consumer friendly labeling of areas needs to be looked into further.

- It is problematic to suggest that States should delay responses just because of the Presidential Directive, which is only an indication of how the Federal Government will practice restraint.

- There is value in informing the public about the severity of health concerns through classifications. These are different from PSI and ozone action days.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.10 Progress During Air Quality Planning By States

Discussed at April, June, and August 1997 Meetings.

Issue #1 When should progress begin?

Issue #2 Where should progress apply?

Issue #3 What will progress be?

Issue #4 What is the authority for progress requirements?

Issue #5 Should PM, regional haze, and ozone be treated the same or differently?

Background

The pre-SIP phase is defined as some period of time up to when a SIP has been approved by EPA. Areas covered include those areas that potentially violate or potentially contribute to a violation of the new or revised NAAQS for ozone and PM-2.5.

As currently defined in the CAA, 3 years of ambient data are required to designate an area as nonattainment for the NAAQS. After being designated as nonattainment for an ambient standard, the area has up to 3 years to develop and submit an implementation plan to bring the area into attainment with the standard. What is different between the new standard and the standards defined in the CAA is the reduction of ozone precursors during the first 6 years as required by Section 182. This period of time includes the time that an area has to develop and implement its SIP. For the new proposed standards, no reductions are required by an area until after SIP approval.

It has been argued that some progress should be made during this time period. The original interim implementation policy (IIP) required certain measures for existing ozone nonattainment areas that will remain in violation but does not apply to new areas violating the new NAAQS or areas affecting existing nonattainment areas that are not themselves designated nonattainment. Several ongoing national programs will result in improved air quality, including the MACT and Acid Rain programs as well as national mobile source emission reductions and new

rules promulgated pursuant to Section 183 of the Act (addressing consumer products and others).

Recommendations from the NRSWG

Following presentations at the April meeting, an Ad Hoc Group was formed with representatives from the Coordination Group, NRSWG, and BPAPWG. Consensus was reached on the final issue paper.

The NRSWG developed the following recommendations regarding the five issues.

Issue #1 The need for progress during SIP development begins when the NAAQS are promulgated.

Issue #2 The need for progress applies nationwide with emphasis on areas that contribute to a violation of the standard.

Issue #3 EPA should be charged with pursuing appropriate national measures for the new NAAQS.

State/local planning efforts should be required in conjunction with RAMP activities.

Progress on implementing State and local control measures prior to SIP approval. The nature of the controls should depend on the area.

A preliminary AOI or nonattainment area is expected to implement a prescribed list of measures.

For areas highly probable to be designated as AOI or nonattainment, emission reductions should be pursued in an expeditious and prudent manner, to include regional controls and/or market-based strategies.

For areas where there is not an adequate indication of violation, no new controls will be expected. However, it is presumed those areas will participate fully in State planning and RAMP activities.

Issue #4 This issue should be referred to the EPA Office of the General Counsel.

Issue #5 The policy elements of progress should be the same. However, it is apparent that the timing of implementation for different pollutants will differ.

Consensus could not be reached by the NRSWG on the timing and nature of State/local control measures.

Options include:

- voluntary or economic incentive measures.
- required control measures as soon as designations are made, and
- required control measures as soon as standards are promulgated and violations or contributions to a violation are known or suspected.

A comparison of the Presidential Directive with the work of this Subcommittee led to conclusions that both are generally consistent and further revision of the issue paper is not warranted.

Discussion by the Subcommittee

Below are highlights of selected Subcommittee comments on the issue paper.

States and Tribes

- States should be given credit for the investigation of national and state

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planning measures. If they are State-only measures, it will give the States flexibility before they become mandatory measures.

- Required State measures, as specified in the issue paper, appear to be different than the Presidential Directive, which calls for incentives.

- End-loaded reductions should be creditable with regard to State control strategies.

- There is an issue about the conceptual differences between mandated and voluntary incentives.

- States want as much flexibility as possible. They do not want a RAMP dictating specific measures.

- Existing nonattainment areas have to continue to make progress anyway, but there is a concern about new areas. The solution is that prior to submittal of the SIP, certain actions have to be taken to protect human health.

Industry

- Regional haze should be treated differently than the other two pollutants since it is a welfare issue and the other two are health issues. EPA answers that they did not try to differentiate between the three standards.

- Economic incentives should be encouraged for areas that do not meet the 8-hour standard.

- A subcommittee member suggests that there should be noncontroversial off-the-shelf measures that States could use in early reduction efforts. These measures would then appear in the SIP.

Environmental/Public Interest Groups

- It is a good policy to ask States to do more than the minimum. A set of control measures should be implemented just as Congress did in the CAA.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.11 Integrated Implementation

Discussed at September and November 1996 and August 1997 meetings.

The NRSWG has addressed integrated implementation in two general phases. Issues 1-4 are related to the first phase of their deliberations in 1996, and Issues 5-7 are related to the second phase in 1997.

Issue #1 What implementation issues best lend themselves to an integrated approach?

Issue #2 What data are needed to develop an integrated strategy, and how will these data be gathered and analyzed?

Issue #3 What would constitute the elements of integrated control strategies for geographical areas determined to be appropriate candidates for integrated implementation strategies?

Issue #4 What additional issues need to be addressed in Phase II in order to integrate approaches to implementing the NAAQS and regional haze rules?

Issue #5 What strategies and control measures exist that have multiple pollutant benefits or problems?

Issue #6 How will EPA solve multiple pollutant problems when the assessment tools or planning time lines are different, where the benefit of integrating plans and controls is not obvious, or where

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an integrated controls response is negative?

Issue #7 What are the incentives for early implementation of integrated controls where they are indicated as positive?

Background

The general premise behind integrated implementation is that the assessment of ozone, PM-fine, and regional haze, along with their related compliance and control strategies, can be optimized through considering the pollutants in an integrated way, rather than independently. A body of evidence links the pollutants through common precursors, photochemical reactions, and transport mechanisms. The Subcommittee generally feels that administrative incentives and regionally-sensitive guidelines for NAAQS and haze program integration could provide significant benefits while acknowledging that integrating time lines and milestone dates should not delay the achievement of a NAAQS or reasonable progress toward air quality improvement. Also, the Subcommittee feels that any new administrative guidelines for integration within individual SIPs should address regional as well as national considerations of monitoring, modeling, comprehensive technical assessment including inventories, and control strategy development.

The Phase I integrated implementation paper provided an in-depth definition of an optimum integrated implementation approach, stepped through possible scenarios for achieving integration, and identified technical tools that will be needed to pursue integrated air quality assessments and to produce reasonably integrated plans. The NRSWG strongly encouraged accelerated implementation of expanded monitoring, modeling, and emissions inventories, including speciation and transport considerations.

The Phase II discussion of integration efforts focuses on situations where the administrative requirements, evaluation tools, plan development criteria, and level of air quality understanding are not immediately conducive to full integration. Issues and questions are identified for situations that have more obviously complementary problems and solutions for multi-pollutant air quality management versus those that do not point as obviously toward integrated solutions or that reflect very different or uncertain emissions or transported pollutant problems.

The work group's discussion focused primarily on situations where integrated response is clearly beneficial. A primary consideration is how to most appropriately weigh the multi-pollutant control benefits of different measures in crafting an optimum strategy. Beyond basic efficiency considerations, criteria could include relative control cost, optimum controls timing, regulatory/control measure flexibility, a balance of air quality and investment certainty, and aggregate socioeconomic impact. The work group also sees a need to develop targeted incentives that could provide State and emission source stakeholders with the capability to address and build integrated control responses that have sufficient future air quality improvement certainty to facilitate health and environmental stakeholder support while not increasing regulatory burdens, investment uncertainty, or risk.

Recommendations from the NRSWG

EPA should develop guidelines to help States integrate efforts to address more than one of the three air pollution problems simultaneously.

These guidelines should: 1) recognize the regional nature of the array of monitors and speciation needs for future integration, and 2) develop different regional performance-based, multi-pollutant monitoring, modeling, and emissions inventory approaches, including speciation and transport, with an effective periodic measurement and evaluation system.

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The Subcommittee concurred with this recommendation.

Following are the recommendations made by the NRSWG at the August 1997 meeting on its second phase of study. The Subcommittee reached general consensus on the recommendations at that meeting.

1. Optimize the assessment of ozone, PM-fine, and regional haze and their related compliance and control strategies through consideration of all three pollutants in an integrated fashion rather than independently.

2. EPA should not force implementation time lines to coincide.

3. EPA needs to address the issue of regional haze improvement where early local NAAQS SIPs would not drive program development and automatic progress. This action might involve incentives to pursue regional approaches to address transport where the science warranted a broader or more distant area response.

4. EPA should provide States with incentives and encouragement for periodic, SIP-driven integrated plan evaluations rather than mandate mid-plan corrections for building integrated strategies and for refined integrated milestones.

5. Through implementation guidance, EPA needs to encourage greater or more flexible SIP attainment or progress credit for sources or source sectors investing in longer term, optimized multi-pollutant controls.

6. EPA and States should emphasize using control measures with multiple pollutant benefits in crafting SIP strategies addressing both the ozone/PM NAAQS and regional haze.

7. EPA should consider a broader criterion for possibly waiving or adjusting the timing or location of controls based on multi-pollutant and transport effects on public health and visibility.

Discussion by the Subcommittee

Below are the highlights of selected Subcommittee comments at the November 1996 FACA meeting, discussing the merits of the recommendations from Phase I.

States and Tribes

- Continuity is needed in defining regional guidelines across the country.
- East and West should not be considered up front as the only two regions in the country.
- The concept of “minimum guidelines” was a concern.
- If the level of complexity increased, it is much more likely that nothing would get done.

Industry

- Emission inventories are an issue and are characterized as the missing link that took up the most time.

Environmental/Public Interest Groups

- It should not be a choice between national and regional guidelines; there should be national guidelines that are amplified by regional guidelines.

Academia

- There are at least two kinds of integration, within pollutant categories and across pollutant categories, both of which are desirable.

Discussion by the Subcommittee

Following are highlights of selected Subcommittee comments on the Phase II

recommendations discussed at the August 1997 meeting. (Only one comment on the Phase 2 issue paper presented at the August 1997 meeting before the Subcommittee agreed that it had reached consensus on the recommendations.)

Industry

- Recommendation 3 might not account for Title IV in the East. The phrase "NAAQS and other programs planned in the near future" should be used instead of "early local NAAQS SIPs." The phrase, "and other programs," will be used.

Environmental/Public Interest Groups

- Multimedia considerations should be incorporated specifically into Recommendation 7.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.12 Regional Haze

Discussed at September, October, and November 1996 meetings.

Issue #1 What quantitative objectives for regional haze should be set in State and Tribal plans and how would the objectives relate to the new NAAQS for ozone and PM?

Issue #2 What institutional mechanisms should be used to implement a Regional Haze program?

Issue #3 Should Class I areas be addressed individually or in groups?

Issue #4 How should/will reasonable progress be defined?

Issue #5 How long should SIP/TIP planning take?

Issue #6 How often should implementation progress be reported?

Issue #7 What changes in existing monitoring programs will be required to support a new regional haze initiative?

Issue #8 What are the long-term strategies?

Issue #9 How should BART be applied to regional haze?

Background

Since 1977, EPA has had the authority to promulgate regulations and guide States and Tribes in their determination of what emission management programs constitute reasonable progress toward the national visibility goal. However, when EPA promulgated its initial visibility protection regulations in 1980, it deferred addressing regional haze. The 1990 CAAA authorize EPA to establish visibility transport regions and associated commissions for assessing technical information and recommending regional haze measures, and specifically called for establishing a commission to protect visibility in the Grand Canyon region. The resulting GCVTC issued recommendations to EPA in June 1996. The CAA stipulates that EPA, within 18 months of receiving the recommendations, should carry out its regulatory responsibilities under section 169A to ensure reasonable progress toward the national goal.

The statute also calls for EPA's regulations to include criteria for measuring reasonable progress toward the national visibility protection goal.

The NRSWG was asked to examine regional haze and visibility protection issues in the context of EPA's current review of the PM and ozone NAAQS and

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the pending response to recommendations of the GCVTC. The national visibility goal from section 169A of the CAA mandated the prevention of any future, and the remediation of any existing impairment of visibility in mandatory Class I Federal areas in which impairment results from manmade pollution. The CAA further specifies that visibility impairment consists of "reduction in visual range and atmospheric discoloration." It charged EPA with promulgating regulations to assure "reasonable progress toward meeting the national goal."

Recommendations from the NRSWG

The work group laid out several objectives of a Regional Haze program and options for meeting those objectives.

1. In developing quantitative objectives for regional haze, two important factors were the target and the date that the target should be met. Options for meeting the objectives included: a) having EPA specify the improvement needed for all Class I areas, by region or by area, in the Regional Haze rule; b) having Federal land managers (FLMs) provide information on current visibility impairments in their areas and their target objectives; and c) setting up institutional mechanisms that would include States, Tribes, FLMs, the public, and other stakeholders to set objectives. The work group preferred option c.

2. The role of these institutions would be planning, analyzing, and implementing Regional Haze programs and also could include developing quantitative objectives. The institution's role would influence the direction of the Regional Haze rule. Options for the institutions included: a) Visibility Transport Commissions; b) an AOI planning body composed of representatives from States, Tribes, and other stakeholders; c) a multi-State Memorandum of Understanding or informal agreement to work together among several States and/or Tribes; d) individual States or Tribes; or e) combinations of the above. The work group chose not to make a recommendation, saying that their recommendations needed to be developed in conjunction with the work group addressing institutional mechanisms. It was noted that any recommendation should reflect the fact that States and Tribes have the authority to develop SIP provisions where needed.

3. Options for designating Class I areas included: a) addressing them one by one and developing AOIs for each; b) grouping Class I areas first and then identifying regional haze AOIs; c) identifying ozone and PM AOIs first, then modifying them based on which Class I areas were in or near them; and d) placing every State and Tribe in a broad regional planning area that would identify PM, ozone, and regional haze AOVs. The work group supported option d.

4. The EPA needed to include in its rule the criteria for determining reasonable further progress. The following criteria were suggested and discussed by the Subcommittee (and were based on work done by GCVTC, modified to apply in the East as well):

   - Reductions in manmade visibility impairment could be verified by emissions tracking and visibility monitoring data.
   - Steady progress should be sustained and documented at each interval of review.
   - Program adjustments would be made incorporating periodic review of progress from visibility and nonvisibility programs.
   - Continuing improvement would be made to remedy existing and prevent future impairment.

- The cost effectiveness of additional controls would be evaluated in relation to visibility improvement.

- Beneficial and adverse impacts of the program on energy, environmental, and other secondary factors would be taken into account.

- Monitoring data and visibility modeling would be enhanced to ensure that controls were effectively achieving visibility improvement.

- Well-coordinated monitoring programs, administrative systems, funding, and other support mechanisms would be in place to implement the program.

5. Regional haze control measures should be included in a SIP, TIP, or regional plan. Because of a 12 month requirement for regional haze SIPs in the law, the work group recommended that initial SIP focus data and modeling needed with less emphasis on control strategies. The PM-2.5 SIP would also look at regional haze benefits.

6. The work group recommended that the programs proceed on a similar schedule once planning had begun for all ozone, PM, and regional haze programs and that progress would follow the RFP timelines.

7. The work group recommended that the Federal visibility monitoring guidelines be updated for the IMPROVE protocol as soon as possible, and that any existing monitoring data should be used in the short term.

8. The work group recommended long-term regional haze strategies that could add flexibility and long-term effectiveness if integrated with the PM-2.5 and ozone plans. These strategies might have an added importance in the eastern United States where the initial progress came from Title IV cap and trade programs.

9. Section 169A(b)(2) of the CAA requires that rules for regional haze address the issue of BART for certain major sources. Under the existing visibility program, BART has proven to be an expensive attribution and analysis process that has only been considered in a few cases. The work group recommended that the regional planning process consider a broader range of sources contributing to regional haze and determine the appropriateness of BART in the context of other requirements to address the new NAAQS and regional haze. Other measures might include market-based strategies, technological advances, and criteria for the impact of source categories, such as proximity, amounts of emissions, and types of particle formation.

Discussion By The Subcommittee

Below are highlights of selected Subcommittee comments on the objectives of a Regional Haze program and options for meeting those objectives as outlined by the work group at the November 1996 meeting. Discussion was limited since control strategies and innovative strategies papers were being developed.

States and Tribes

- There are questions as to how regional haze relates to the integration of the standard setting process.

- There is a need for a basic criterion for the stakeholder group.

- There is a need for clarification as to whom from the stakeholders speaks for the States, Tribes, and FLMs.

- There is concern over the secondary standard issues, and it is unclear whether there are areas of violation, other than Class I, that will be selected to participate in the planning process.

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- The planning processes are getting confusing, it is unclear what is supposed to be an enforceable document.

- In the East there are questions about the amount of involvement of the States in regional haze issues. The response is that the entire Title IV program addresses regional haze.

- It is believed that using innovative strategies to realize reductions in a BART-like manner will prove to be very successful.

- There is a need for the development of clear, objective targets for measuring reasonable progress.

- Stakeholders should be involved in setting objective visibility targets. These targets may be different based on the views of the stakeholders. For example, the targets for Mt. Rainier may be different than those set for Shenandoah National Park.

Industry

- It would be appropriate to set specific targets, whether they were long-term goals or specific progress targets. Reasonable progress involves taking all things in balance.

- The intent of institutional mechanisms is to have a central coordinated planning group developing overall. A recommendation would move forward from this group to EPA and the States.

- How should non-NAAQS issues be incorporated into a visibility program?

- There is confusion over the criteria laid out in item 4 above. Do the stakeholders need to have the same criteria?

- Was BART singled out in this process, or was it a whole suite of control processes? The answer is that BART had traditionally dealt with very specific sources, something different than what was proposed here. There is a preference for changing the wording to reflect regional haze control strategies.

Environmental/Public Interest Groups

- To remain consistent with the content principles, the Regional Haze program needs to incorporate specific timeframes (for setting reasonable progress objectives and periodically assessing progress) as well as a Federal "backstop" to ensure reasonable progress objectives are met.

- With regard to the criteria, it is assumed that the fourth item, continuous improvement, is the driver.

- This program will help to address welfare effects to be protected by a secondary standard.

Federal Agencies

- NAAQS exist for ozone and PM. There is no standard for regional haze, and thus a process is needed to reach the national goal for regional haze. There is an opportunity here to start the process early, without having to use the whole concept of a visibility transport commission.

- There is a preference for moving away from the terminology of BART and allowing as much innovation as possible. Although BART allowed one to look at a whole suite of alternatives, it also raises the possibility that this could be a Phase II issue.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.13 Transportation Conformity

Discussed at June 1997 meeting.

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Issue #1 Where should transportation conformity apply?

Issue #2 How should transportation conformity be implemented if it is applied to areas that are much larger then metropolitan areas?

Issue #3 When should transportation conformity be required for the new/revised standards?

Issue #4 Should the scope of transportation conformity be expanded to facilitate more comprehensive intermodal planning, e.g., interplay between rail and truck transportation?

Issue #5 Should transportation conformity relate to reasonable progress requirements under a regional haze rule?

Background

Section 176c of the CAA requires that the overall air quality impact of road construction and other transportation-related activities must be determined before such activities may take place. Specifically, the U.S. Department of Transportation (DOT) may not fund, approve, or support highway and transit activities unless it demonstrates that they will not cause new violations, worsen existing violations, or delay timely attainment. EPA promulgated the transportation conformity rule on November 24, 1993. It has been amended twice since, and EPA is expecting a comprehensive set of amendments to be finalized in the near future.

The transportation conformity rule establishes the process by which DOT and metropolitan planning organizations (MPOs) determine the conformity of transportation plans, programs, and projects. Individual States are required to adopt conformity SIPs, which are for the most part verbatim copies of the Federal rule. Although some States have adopted conformity SIPs, many States are waiting for EPA's amendments to be final before promulgating their own regulations. The purposes of transportation conformity are to reinforce SIP goals and ensure that SIP motor vehicle emission targets for attainment and maintenance are met; ensure that transportation plans, programs, and projects contribute to emission reduction strategies included in SIPs; ensure timely implementation of transportation control measures in approved SIPs; provide a process by which transportation and air quality planning agencies consider long-term impacts from transportation plans, programs, and projects; and provide a forum for interagency and public debate regarding the air quality impacts of proposed transportation investments and how air quality and mobility goals should be reconciled.

EPA's proposed IIP stated that transportation conformity determinations would not have to consider the new NAAQS until SIPs addressing the NAAQS were approved by EPA. Because existing SIPs will remain in place, conformity in existing nonattainment and maintenance areas would continue to be demonstrated using existing SIP budgets.

At the June 1997 meeting, a presentation was made to the Subcommittee on a preliminary set of transportation conformity issues and options. No recommendations were made, and the issues/options were never fully developed as a result of the July 1997 Presidential Directive.

Discussion by the Subcommittee

Following are selected comments from the Subcommittee discussion at the June 1997 FACA meeting.

States and Tribes

- There is concern that State or local governments may have to implement programs immediately after the standards are approved.

- The application of conformity should be determined within the context of the planning process, which is the California experience. Conformity should apply upon submission of the SIP for existing areas and upon approval of the SIP for new areas.

Industry

- Economic incentives should be inserted into transportation conformity as a budgetary process.

Environmental/Public Interest Group

- General conformity is a particularly sensitive issue. Conformity would be a perfect pre-SIP RFP measure.

Academia

- The existing transportation data are very difficult to use in air quality analyses. VMT growth calculations are problematic. Data needs to be captured and integrated into air quality analyses more effectively.

Federal Agencies

- The legal constraint issue needs to be dealt with in conjunction with transportation conformity.
- The mismatch between SIPs and transportation plans needs to be evaluated.
- DOT and EPA need to be in sync on the issues.
- The IIP indicates that conformity wouldn't apply until SIPs were approved, however, an option here indicates that conformity could be in use prior to SIP approval.
- Further expansion is needed on the issue of where transportation conformity applies.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.14 Treatment of Areas in Which Air Quality Trends Indicate the Risk of Violating an Ambient Standard

Discussed at October 1996 and June 1997 meetings.

Issue #1 How should areas at risk be identified and who should be responsible for identifying these areas?

Issue # 2 Should there be a formal policy to encourage or require an area at risk of violating the NAAQS to act affirmatively to avoid further deterioration in air quality and designation as a nonattainment area or AOV?

Issue #3 Should action on the part of areas at risk be voluntary or mandatory?

Background

For purposes of designating air quality with respect to criteria pollutants, the CAA divides the country into attainment, nonattainment, and unclassifiable areas. Although SIPs must provide for implementation, maintenance, and enforcement of primary NAAQS, the Act specifies only very minimal steps that States must take in attainment and unclassifiable areas that do not contribute significantly to nonattainment elsewhere, regardless of how close those areas may be to nonattainment status. Once an area slips into nonattainment, however, it will carry the stigma associated with that designation and be subject to difficult, and in many cases unpopular, requirements for planning and implementing a control strategy to attain the NAAQS. Among other elements, the plans must address emissions from existing sources and include more prescrip-

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tive control technology requirements and emission offsets for any new sources.

The BPAPWG began with the premise that it is preferable for areas that are not violating a standard, but are in danger of doing so, to act affirmatively to avoid further deterioration in air quality that will result in designation as a nonattainment area or AOV. The work group and the Subcommittee agree that it is desirable to identify areas that are at risk of violating a standard and to seek to avoid such violations. There is a significant difference of opinion about how this should be done and whether efforts to identify and address such areas should be voluntary or mandatory.

Voluntary approaches have the advantage of imposing no new regulatory requirements and giving the States or other regulatory bodies maximum flexibility in selecting methods for determining which areas may be in danger of violating the standards and selecting the appropriate response in such areas. However, voluntary approaches may not be pursued effectively.

A mandatory Federal program provides EPA with greater authority in areas with deteriorating air quality and prevents States and local planning bodies from ignoring or placing a low priority on areas in which air quality is deteriorating. On the other hand, a mandatory program brings greater Federal involvement in air quality management, will likely be limited in its flexibility for addressing differing problems, and may subject an area with declining air quality to the very types of mandatory control requirements and stigmas associated with nonattainment.

The BPAPWG realizes that using monitoring data to identify a trend of deteriorating air quality in an area that is in attainment generally will be confounded by the year-to-year fluctuations in monitored air quality that result from short-term variations in meteorology. Such meteorological variations previously have been identified as possibly causing areas to flip between attainment and nonattainment. Statistical techniques may be available to address this problem.

Recommendations from the BPAPWG

- The BPAPWG addressed key issues that considered the appropriateness of voluntary and mandatory approaches to action by areas at risk of violating the NAAQS.

    1. Under voluntary approaches, the work group considered two options: a) having no new programs; or b) initiating programs to encourage and guide voluntary efforts. Under option (a), there will be freedom for such steps as “ozone action days” to be taken unilaterally or through ad hoc agreements with EPA, which has demonstrated a willingness to work with areas that take the initiative to avoid or minimize violations and has the flexibility to reach agreements that can include benefits for acting early. For option (b), EPA can take actions to encourage and assist States in identifying and developing programs for areas that are believed to be tending toward air quality that violates a standard. For example, EPA could provide guidance to States and other planning bodies on available approaches for tracking air quality trends and assessing whether an area is sufficiently close to a standard violation to warrant development of a remedial program. EPA also could provide States with incentives for adopting programs in areas that are determined to be at risk of violating a standard.

    2. Under mandatory approaches, the work group developed two options: a) partial mandatory programs; and b) full mandatory programs. Programs under option (a) would have some mandatory features and thus

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ensure that an area does not ignore warning signs while recognizing that the area is still in attainment with the applicable standards. For example, an area at risk may be required to compile more complete inventory information and develop a contingency plan. Full mandatory programs under option (b) have precise, Federally-established procedures for determining when an area is at risk and require that prescribed control measures be implemented within such areas to avoid nonattainment. Some members of the BPAPWG argued that this approach effectively reduces the level of the ambient standard.

The approach favored by the majority of the work group is generally captured by Option 1b. While environmental group representatives preferred stronger action, they agreed that Option 1b represented an improvement from the status quo and was preferable to taking no action.

Discussion by the Subcommittee

Below are highlights of selected comments of the Subcommittee on the options and recommendations outlined by the BPAPWG at the June meeting.

States and Tribes

- There is broad awareness of the implications of being designated as nonattainment, and areas will work to avoid that classification. Several States have existing voluntary programs to which they have seen good response.

Industry

- There is a role for EPA to play in helping areas that are at risk as partners in encouraging voluntary efforts and in affording the flexibility needed to make voluntary approaches successful.
- A forecasting tool for areas to use in determining when they are going in or out of attainment will be helpful. Areas at risk can benefit from a simple model to make these types of predictions, perhaps on the basis of emissions forecasts.

Environmental/Public Interest Groups

- The voluntary approach is only a slight improvement over existing programs because States already have the option to voluntarily implement programs to avoid nonattainment. EPA should formulate guidance that would inform States about areas at risk of nonattainment. In some areas voluntary controls are helpful; however, there are areas that will require mandatory controls to avoid nonattainment. Environmental groups said that there is no consensus of support for Option 1b.

Federal Agencies

- There should be an examination of how monitoring can support responsible voluntary actions by areas at risk.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.15 Implementation of a "Too Close To Call" Designation Category for Attainment Demonstration

Discussed at July 1996 meeting.

[Official Name: "*Too Close To Call*"]

Issue #1 Should there be a category designated as "too close to call" to alleviate problems of areas going in and out of attainment because of extreme or unusual meteorological conditions?

Issue #2 What would be an effective and understandable approach for

defining the "too close to call" areas that would not cause areas to be inappropriately omitted from nonattainment status?

Background

The CASAC included the following statement in its closure letter on the primary standard portion of the staff paper on ozone:

> "The present standard is based on an extreme value statistic which is significantly dependent on stochastic processes such as extreme meteorological conditions. The result is that areas which are near attainment will randomly flip in and out of compliance. A more robust, concentration-based form will minimize the flip-flops, and provide some insulation from the impacts of extreme meteorological events. The panel (CASAC) also endorses the staff recommendation for creating a too close to call category."

Under the current attainment test criteria for ozone, the effective design value needed to be at a level within the range of the background in some locations. The stringency of this attainment test caused concerns that the present air quality standards for ozone might not be achievable long term. Considering the likelihood that the revised ozone and PM standards would be more stringent than current standards, the achievability problems would become even more severe over large areas of the country.

A specific technical procedure was needed to define the "too close to call" category in the implementation policy. That procedure must be scientifically defensible and ensure that areas in nonattainment would not be inaccurately categorized and subject to inappropriate or insufficient control requirements.

Recommendations from the BPAPWG

Members of the BPAPWG developed five options for too-close-to-call areas.

1. Do not change the present attainment test methodology. This approach would not change current procedures and prevents confusion. However, it continued to ignore basic problems associated with meteorological fluctuations affecting an area's attainment status.

2. Implement a new attainment test to determine whether an attainment area that briefly exceeds the level of the standards should be classified as "too close to call" or reclassified as nonattainment. The approach would be applied only to areas that have been classified as attainment. Use of standard error of the 3-year average of the annual nth highest measure value seemed to be a logical choice for a rigorous scientific test. This test assumed that the confidence in the annual average nth highest value increased or decreased as the annual concentration fluctuations decreased or increased respectively.

3. Implement the approach in "2" above and apply it equally for both attainment and nonattainment areas. This approach also would address areas that were just over the standards but had measurements below the standard in years of good meteorology.

4. Use a weight of evidence approach in the attainment test. This approach, considered primarily for ozone nonattainment, would apply a statistical test similar to that used now and a deterministic test that would require the modeled ozone concentration in every grid cell to be below the standard on all primary episode days. If an area failed either test, a weight of evidence determination could be applied to reassess attainment status. The weight of evidence procedure could consider factors such as model performance and confidence in model input variables, trend analyses, consistency in direction of control between observation based model results and grid model predictions, and severity of episodes and incremental cost/benefit analyses for

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extraordinary control measures required to further emissions. This approach had the benefit that it could take into consideration all possible factors that might lead to unusual values above the level of the standard, but it had the disadvantages that it would be difficult to explain and could be construed as being subjective.

5. Use 5 years of monitored data and ignore the highest and lowest values to calculate the mean from 3, not necessarily consecutive, years out of 5 years and compare the mean to the standard. This option did not address the "too close to call" procedure directly but might be used in conjunction with some "too close to call" test to reduce the impact of any 1 unusual year in terms of meteorology.

The work group referred these issues to the STSWG for their consideration and comment and STSWG provided no formal recommendations.

The STSWG did not discuss the scientific aspects of the "too close to call" implementation, although it did discuss a statistical analysis and it emphasized that ignoring the attainment flip-flop problems could lead to an overly stringent or unachievable design value.

Discussion by the Subcommittee

Below are highlights of selected comments of the Subcommittee on the issue paper.

States

- An area currently has to measure 125 parts per billion (ppb) to be considered in violation of the 120 ppb standard. If this margin increased, there might be a reduction in the number of attainment/nonattainment shifts, similar to the way permit levels are set relative to compliance levels.

Industry

- States should be given some flexibility in addressing meteorologically-influenced fluctuations in mean ozone concentrations when defining "too close to call" policy.

Environmental/Public Interest Groups

- "Too close to call" should not be addressed in the standard setting process, which should remain completely driven by health and welfare concerns. Even when considering a rigid health-based standard, the paradigm of AOVs being distinct from AOIs for control purposes should soften the impacts of the "too close to call" problem.

- The idea of a margin should be dropped because scientific information indicated that increasing the "too close to call" margin would do little to avoid the problem of areas coming in and out of attainment.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.16 Air Quality Models and Emission Inventories: Their Development, Availability, Evaluation, Use and Limitations

Discussed at August 1997 meeting.

[Official Name: *Modeling and Emissions Inventories*]

Issue #1 What is the appropriate use of models in identifying strategies leading to attainment or continuing nonattainment and RFP assessment?

Issue #2 What is the best method(s) for identifying and treating uncertainty in emissions inventories and the meteorological, emis-

sions, and air quality modeling processes?

Issue #3 How much flexibility in model choices should be allowed in the attainment/RFP modeling process, and should proprietary or closed models be used?

Issue #4 How would models and emission inventories be used in AOI identification?

Issue #5 How can uncertainties in emissions inventories be reduced?

Background

Progressive steps toward effective integrated air quality management involving consideration of multiple pollutants (i.e., ozone and PM) and multiple effects (i.e., health, welfare, regional haze) will place new demands on emissions inventories and air quality models. It is generally agreed that air quality models exist to develop ozone and PM SIPs. However, it is also generally agreed that there are significant uncertainties in emissions inventories and air quality modeling primarily arising from uncertain emission estimates and inadequate air quality data, particularly for PM. In addition, there are resource limitations in overcoming the reduced confidence arising from these uncertainties. Air quality modeling and emissions inventory development should be viewed as evolving processes, one outcome of which can be identifying a strategy to lead an area into achieving specific goals, along with information on how to assess progress toward that goal. As the process evolves, uncertainties should decrease, with a concurrent increase in the confidence of strategies resulting from the processes.

Recommendations from the NSRWG and STSWG

Following are recommendations developed jointly by the two work groups.

1. Air quality models and the air quality modeling process, when applied correctly and in conjunction with other information, should provide the best means of assessing the necessary levels of controls. The process should be iterative and ongoing with periodic reassessment. Developing new guidelines to include more extensive evaluation is key to improving confidence. The work groups also recommend that the more advanced use of existing models and the development of more advanced models are key to improved air quality management in the future.

2. Uncertainty assessment is an important process, providing a means to improve future efforts and to better assess risks and rewards that can accrue from the choice of alternative strategies. It is commonly done in most environmental assessments and is now being done for air quality modeling by some parties. With the current time lines, uncertainty assessment it is very feasible.

3. The concept of a guideline model should be dropped; instead, the use of the most appropriate set of models should be encouraged. Flexibility is strongly supported, and no preferred or default approach should be given. The flexibility is limited, however, to models that are generally available and open to inspection and testing. The models should be peer- reviewed in scientific literature.

4. Use advanced, peer-reviewed techniques to identify pre-AOIs, allowing flexibility in which methods could be allowed. EPA can facilitate this process by assessing various methods and assisting in their application to specific regions, though it is uncertain that they should have the role of defining the pre-AOIs.

5. Start with existing inventories for preliminary AOI definition and switch

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to refined inventories for final RIPs/ TIPs/SIPs. Develop a mechanism to provide incentives so that sources will better characterize their emissions. Such incentives would not be limited to industries. Incentives can be provided as a fee based on uncertainty levels or a requirement to increase control levels to make up for uncertainties. By involving the stakeholders in the process, historical evidence suggests the incentive exists to ensure that major sources have well-characterized emissions. They should be made active participants in the RAMPs and on advisory committees in the emissions and modeling process. Industry has led in past efforts when done in association with intensive data collection.

Discussion by the Subcommittee

Following are summaries of selected comments made by Subcommittee members at the August 1997 meeting.

States and Tribes

- A regional assessment of culpability was conducted and should have been included in the Source Attribution Workshop held in Research Triangle Park in July 1997. If there are flaws in the model, there are flaws in the analyses. Recognizing nonlinear relationships, the model is able to track contributions to sub-regions. The costs of reductions in different sub-regions are considered. Several examples are given of the work and a percent culpability map that shows which areas affect certain cities was presented. S.T. Rao's work shows smaller cuts. More runs have been completed of this model resulting in a good correlation.

- Area-wide controls must be used. A workshop on SIP development is recommended.

- In Los Angeles, certain VOCs and NO_x do not have the same impacts. It all has to balance out. EPA has to weigh these and many other issues.

Industry

- The work of the NSRWG/STSWG on this issue is complimented, including the "too close to call" areas. These discussions are well-founded but not much recognition of them in policy development is evident.

- The idea of a SIP development workshop is supported; these scientific studies need to be included in policy decisions.

- Percent culpability is a known that has not been expressed. This differs sharply from mandatory uniform cuts based on SIP calls.

- Although a one-size-fits-all approach is infeasible, one cannot have 15 custom programs. OTAG needs at least two or three different programs.

- All of the issues discussed here have been discussed in the OTAG process. Exception was taken to the notion that OTAG efforts are superficial. It is time to make some decisions.

- While not wanting to forestall improvements in waiting for the analyses, using only models will be a mistake.

- A great deal has been learned from all of the information presented. Although substantially more needs to be done to protect people, industry may not know what technologies it needs to get to attainment. They want to create the incentives for development and implementation.

Environmental/Public Interest Groups

- When one begins to look at the fact that there are numerous effects, optimization of models is much more complicated. Multiple ozone seasons can show levels

going in different directions. The question becomes what endpoint one is trying to optimize.

- It is easy to confuse the economic pattern of emission reductions with the cost of emission reductions. The challenge in ozone would be to assign weighting in a market, unlike with acid rain where a ton anywhere in the regime is workable.

Academia

- There is support for a SIP development workshop to be held in the next year.

- A model is a tool and operational tools are very distorted. That is why a conceptual model is recommended. If one needs to make a prediction, one needs to use a model. The message is that large reductions are needed.

- AOIs are complicated. OTAG only looked at four episodes. The amount of money spent on scientific analysis is very small compared to control strategies. Although it may be too complicated, the analyses need to be done.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.17 Utilization of an Exposure-Based Monitor System

Discussed at July 1996 meeting.

Issue #1 Should an exposure-based monitoring system be used with the new NAAQS?

Background

The primary and secondary NAAQS derive their authority in section 109 of the CAA, with current limits of NAAQS in 40 CFR Part 50. In implementing the NAAQS, some experts have recently recommended that ambient monitors be located so that they reflect actual human exposure and health risk, that is, monitors should be placed in regions of high population density. Others have argued that this approach could sacrifice the health of individuals located in less populated areas. As an aside, it has been shown that people, on average, spend approximately 90 percent of their time indoors (Robinson, J., and W.C. Nelson, 1995, National Human Activity Pattern Survey Data Base, U.S. EPA, Research Triangle Park, NC).

Currently, EPA maintains 4,469 monitoring sites throughout the United States. The monitoring program is divided into SLAMS and NAMS. The objectives of the SLAMS are to determine the following: 1) the peak concentration in an area, 2) representative concentrations in areas of high population density, 3) impacts that significant sources have on ambient pollution levels, and 4) general background concentration levels. NAMS, which are a subset of SLAMS, can be divided into two specific groups: 1) urban-scale sites located in areas of expected maximum concentrations, and 2) neighborhood sites located in areas that combine poor air quality and high population density. Under the current approach, monitors often are not located where they obtain the best estimate of pollution levels to which the overall public is exposed. However, this approach is viewed by some as an appropriately conservative methodology that maximizes the protection of public health while also providing an adequate margin of safety.

The scientific community is now reaching consensus that there is no threshold for health effects of certain pollutants, especially ozone. Furthermore, recent analyses have demonstrated that some NAAQS may never be attained because of natural background concentrations of these pollutants. It is becoming clear that no zero-risk solutions are available, indicating that full protection is impractical if not altogether impossible to achieve. The cost effective-

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ness of mitigation strategies becomes important, as do developing, improving, and using important tools such as risk assessment. Since some risk must remain, resources should be prioritized so that their use maximizes beneficial results. One way to maximize benefits is by implementing some form of exposure weighting or averaging of monitors. This approach departs from current practices and raises questions about existing methodologies.

Recommendations from the BPAPWG

The BPAPWG examined different approaches to implement an exposure-weighted monitoring system, which included using existing monitoring networks, designing new or revised networks, weighting ambient monitoring data by population, and averaging ambient air quality data spatially. Following are the work group's recommendations.

1. Determining acceptable levels of risk and exposure should be part of the NAAQS review process, which means that consideration of exposure-based monitoring to determine compliance with NAAQS must be allowed.

2. There is a potential role for exposure-based ambient monitoring in the implementation of emission control programs, regardless of the outcome of the current NAAQS review. It could be used to maximize reductions for population exposure and risk and also could be used as a measure of the effectiveness of emission control programs.

3. The EPA's current monitoring network design and siting criteria need review. The work group recommended that monitoring network design be consistent with the form of the NAAQS, including secondary standards.

Discussion by the Subcommittee

There was disagreement among Subcommittee members on the recommendations in this paper. General agreement was reached, however, on the following statement: "in evaluating different strategies, each of which would attain the standard, decision makers should give preference to strategies that provide improved air quality for the greatest number for people." Below are highlights of selected comments from the Subcommittee on the three recommendations concerning an exposure-based monitoring system outlined by the work group at the July 1996 meeting.

States

- Exposure-based monitoring could be used as a tool for measuring progress, but there is concern over the wording in the existing proposal.

- It is agreed that the paper should be tabled.

- It is noted that much time has been spent on this issue but that consensus has not been reached.

Industry

- The use of population-based monitoring in nonattainment areas would minimize the size of the population at risk and provide incentives for nonattainment areas to install new monitors to better define their extent.

- The BPAPWG should revisit the issues and attempt to reach consensus on a strategy that would improve air quality for the greatest number of people.

- The use of spatial averaging of monitors is advocated to handle areas that move in and out of attainment.

Environmental/Public Interest Groups

- There is concern over potentially controversial policy judgments embedded in this issue (i.e., the recommendation could be interpreted to mean that people living in sparsely populated areas would not receive the same level of attention

garnered by persons living in more densely populated areas).

- Changing the language from "give preference" to "give added weight" to strategies for improving air quality would allow diverse solutions rather than a single preferred strategy.

- Strong opposition exists toward exposure-based monitoring as a viable option in determining attainment. This opposition is based on the belief that exposure-based monitoring will weaken public health protection.

- Environmental groups believe this approach assumes that there are many monitors located in the appropriate places. In fact, there are few monitors and population in the vicinity of some monitors is lower and will not provide data indicative of wider public health impacts.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.18 Control Strategies

Discussed at April, June, and October 1997 meetings.

[Official Name: *Control Strategies Framework*]

Issue #1 To what degree should the initial round of control strategies offer States flexibility to tailor control strategies to an area's air quality needs?

Issue #2 How can a State assure EPA, the public, and stakeholders that a control strategy will achieve timely and certain attainment of air quality standards?

Issue #3 How should the situation be handled where national measures are not implemented or are not timely? What is the consequence to the regulatory agency (i.e., sanctions)?

Background

The CAA provides States with a great deal of flexibility in the development of SIPs for attaining NAAQS. Under EPA rules governing SIPs, they were acceptable as long as they were met by 1975, with extensions possible to 1977. With widespread nonattainment problems persisting after 1987, the 1990 CAAA further increased the amount of Federal prescription in the development of control strategies. It prescribed very specific measures for nonattainment areas, categorized by the severity of the nonattainment problem.

Thus, the approach to attaining NAAQS since the early 1970's has moved from considerably more discretion at the State level to a more top-down approach with detailed Federal prescriptions. Approaches to the problem also have included organizations other than air quality planning authorities, such as metropolitan planning organizations other than air transportation planning. However, the NAAQS for ozone and PM are still exceeded in many areas, and regional haze remains a problem in Class I areas.

Some States and State legislatures resist prescribed measures and the resultant lack of flexibility to develop control strategies. There have been significant improvements in the tools available for improving air quality since the early 1970's, particularly in the areas of air quality modeling and air pollution control technologies. If States were given more flexibility, modeling could provide a basis for achieving greater economies in attaining the NAAQS. However, many States have laws restricting, in some manner, State regulation beyond Federal requirements. Any increased flexibility provided by reduced prescriptive measures could increase the responsibility placed on discretionary measures for meeting the NAAQS.

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Some control measures are best implemented at the national level. In fact, some ozone nonattainment areas have been able to demonstrate attainment solely on the basis of Federal control measures. In addition, the transport of pollutants and pollutant precursors creates a need for measures that can be applied over multi-State domains, where appropriate. However, it is also important to note that the statutory authority for many national measures is separate from the statutory authority for NAAQS.

The NRSWG and BPAPWG have developed a framework for selecting and implementing control strategies. The framework is based on the implementation of successful air pollution control strategies that reduce emissions and attain healthful levels of air quality. The work groups agreed that control strategies should result in timely and certain attainment of air quality standards; retain flexibility so that the strategy can meet an area's air quality needs most efficiently; and provide a way to regularly assess the effectiveness of the strategy. To achieve these goals, the work groups developed an alternative route for SIP development and implementation that provides timeliness, flexibility, and a means of formal assessment.

Under the proposed alternative, States or local agencies will have some period of time from the date of designation to attain the standard or to demonstrate that the measures will achieve attainment by the statutory deadline. The demonstration will use methodologies and performance targets developed by the State, written into the SIP, and subject to EPA review and approval. If the alternative plan is falling short of its targeted reductions, contingency measures that are part of the SIP will be triggered automatically to ensure that the statutory deadline is met.

The key features of the proposed alternative framework are: 1) States and local agencies are given the opportunity to prepare an attainment plan using any mix of innovative and tradition measures; 2) the plan must meet all RFP requirements and show attainment no later than the statutory deadline; 3) the plan must have specific rate-of-progress targets and methods to measure success at meeting those targets; and 4) the plan must include contingency measures with automatic triggers should rate-of-progress targets not be met. Thus, the methods for assessing success will become part of the SIP as will the commitment to use contingency measures. This alternative provides the public with a high guarantee of attainment of the NAAQS by the statutory deadline.

Recommendations from the NRSWG and BPAPWG

Following are the recommendations developed jointly by the work groups.

1. National measures that are clearly identified and required by the CAA will continue to be adopted and implemented according to statutory direction and deadlines. An air quality authority will have the discretion to adopt the additional control strategies needed to meet an area's air quality objectives. (This recommendation is valid only if coupled with Recommendation 2.)

2. Initially, the air quality planning agency has the discretion to develop and implement a control strategy designed to meet air quality objectives. Only when the strategy fails to show reasonable further progress prior to the attainment date do pre-adopted contingency measure kick in. (This recommendation is valid only when coupled with Recommendation 1.)

3. For national measures that EPA fails to develop on schedule, credit will be given from the target date, regardless of the actual implementation date. For national measures that are not implemented, EPA will be responsible for substituting measures sufficient to achieve equal reductions. Sanctions should be waived for States when EPA fails to implement a national rule for which credit has been allowed.

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Discussion by the Subcommittee

Following is a summary of comments made by Subcommittee members at the April 1997 meeting.

States and Tribes

- While not ignoring the Clean Air Act, the thinking on control strategies should go "a little bit outside of the box". An opportunity exists to create a better system for handling today's air quality management issues. It is great if it can be done under the current CAA; if not then the Subcommittee should make recommendations that go beyond the Act.

- The notion of a responsible air quality planning authority should be plural because it will involve at least three levels of government.

- National measures will be chosen because of their broad impacts on air quality; they will be required regardless of air quality status. Diesel engines are cited as an example; it makes much more sense to require uniform controls to be installed at the factory rather than having different requirements imposed by individual States. Control strategies will be based on the assumption that there was more than one way to achieve air quality improvements; the elements that goes into the mix and the order in which they are implemented are the variable factors. The selection of strategies for a given area will involve a number of political jurisdictions at a number of different levels, and the debates among them could be acrimonious. The main objective of the Subcommittee should be to set up an objective, stand-alone process to mitigate chaos in selecting control strategies.

- There are levels of controls that are independent of which level of government required them. As long as there are control strategies that could be required without regard to air quality status, cost constraints will be a stumbling block. The Subcommittee has to allow for preemption in certain areas. There is a very strong cross-over between national programs and local and discretionary measures. Flexibility is necessary in these areas.

Industry

- The term "discretionary required measures" is an oxymoron. It could be reworded as "required measures used at the State's discretion".

- There is confusion about how national measures could fit into the FACA process if there was no regard for air quality status. Questions are raised about how anyone could judge cost effectiveness for control strategies that are incorporated into national programs.

- An industry representative asks whether the issue paper will contain lists of measures and whether this is where the opportunity matrix will fit into the discussion of control strategies.

- A major issue is how control responsibilities will be allocated across national, State, and local governments. The Subcommittee needs to look at these issues from the Federal, State, and local levels. There are limits to EPA's authority in the CAA, specifically when dealing with required measures in sub-national areas that are not already prescribed in Titles I and II. If the Subcommittee is going to go outside the CAA, they should understand what changes will be needed to give EPA authority to implement any measures it recommends.

- A question is raised about whether EPA will lose its statutory authority to require inspection and maintenance programs if, under a new ozone standard, Subpart 2 loses its force.

- An issue is raised about who will make reductions once the need for them is

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identified. Using the diesel engine example, one could assign emissions reduction responsibility to gasoline refiners rather than manufacturers. It is both a scientific and political issue. The reductions needed are site-specific, and there is a good deal of variability. State and local governments are best suited to write coherent plans for their areas. If the Subcommittee chooses to ignore the scientific and political differences that exist in today's world, the system will not function properly. They must select someone to do the reductions and someone to pay for them. Otherwise, they will be avoiding the issues surrounding the costs of the emission reductions. Control strategies should be divided among those politically able to provide the emissions reductions. It could involve a trading program, but that is not the only option.

- The Subcommittee needs to focus on the framework here and not on specific control measures.

- The Subcommittee should go back to the CAA and see what authority EPA had already in the law. They also needed to go back to the Act and see what existed for prescribed measures. The only statutory changes required dealt with AOIs and whether the regulations were extended to them. The CAA also should be evaluated for what it said about discretionary measures.

- A concern is raised about what is meant by impairment and whether they are they talking about specific measurable quantities (e.g., visibility) or much less well-defined air quality-related values, such as those presented in the NSR proposal. In the latter instance, they are subjective, non-quantifiable decisions that posed a significant problem.

Environmental/Public Interest Groups

- A member shed a cautionary light on the discussion of Subpart 2, stating that Subpart 2 goes away if the ozone standard is revised.

- There is concern over the idea that the Subcommittee should be general in its discussion of control strategies and should be developing a process only rather than specific suggestions for control measures. EPA wants to see some specific ideas on controls. If the Subcommittee dances around this issue, it is not going to provide EPA the benefit of its members' diverse inputs. They should be able come to some broad consensus on at least some of the controls. Examples are cited about cleaner diesel fuels and Stage II vapor recovery. There is no better place to look at these measures than in the Subcommittee.

- There is concern over the presentation on control strategies. One of the working assumptions said that areas violating the revised ozone and PM standards will be considered AOVs in advance of or perhaps in lieu of designation as nonattainment areas. The Subcommittee has not adopted the AOI/AOV approach, and the use of this terminology is inappropriate.

EPA

- EPA has authority to issue certain national rules. The issue is whether they could tell specific States what control measures to implement.

- A representative of EPA's Office of General Counsel (OGC) notes that the main issue is the extent of the authority EPA has to prescribe specific control measures. No one has come to OGC yet with that question. For the OTC, OGC has explored EPA using its authority through SIP calls.

Federal Agencies

- The working assumptions presented by the work group are very simplified; they should not lose sight of the complexities involved here. This is a much more

complicated process than what is outlined in the working assumptions.

- Areas with visibility impairment are important; the national visibility goal precludes future visibility impairment. There needs to be a process, and it needed to be defined clearly. For visibility, it might always be considered to be subjective, but a Federal Land Manager has to do the best he or she can. Issues of impairment always have been contentious and will continue to be so.

Following is a summary of selected comments made by Subcommittee members at the October 1997 meeting.

Industry

- The control strategies issue paper appears to have gone one step further than the RFP paper in terms of achieving attainment. The RFP paper concurred that the type of emissions and precursors should be customized at the airshed level, but the RFP group could not agree on whether the rate should be standardized or customized. The control strategies paper proposes full customization up to a point, with a Federal backstop if the target is missed. The backstops should reflect the precursors necessary to achieve attainment and allow an area discretion in choosing types of emissions reduction.

- There should be some accountability and annual monitoring to get programs into place prior to Year 8. For soft control measures, there should be contingency backstops set up for each component that kick in during an early SIP review. Added flexibility should be given to the State, but this also means additional accountability and responsibility. States should be responsible for developing alternatives to deal with the issue if national measures fail.

- The proposal to make the program more flexible for States is endorsed. The Subcommittee needs to endorse the recommendations on national measures. EPA should be held accountable if the States are late.

Environmental/Public Interest Groups

- Backstops are necessary.

- Allowing programs that may or may not work is moving backwards. The CAA provides that all reasonable control measures be used as expeditiously as possible. This framework is a way of delaying the adoption of measures and subsequent attainment.

- The attainment dates paper provides for reaching attainment in 5 years and this paper does not. Under this proposal, it is possible that there would not be enforceable measures until 2007 or later.

States and Tribes

- Allowing States flexibility is a good thing and does not necessarily imply a delay in the process. The points on kickstarting the programs are good. The paper needs to reflect that getting things started ahead of time is good, but doing a SIP without good science is not. Sound science will be needed to convince stakeholders that selected measures are the right ones to reduce their emissions.

- The timing of a 7-year period seems to reflect a transitional area's needs but will not necessarily work for areas with longer attainment dates. Backstop measures often are designed for a national audience. States design effective programs and should be allowed to continue.

- States should not be allowed to claim emissions reductions when the national measures fail. This does not reflect reality, and States ought to be responsible for cleaning up their air.

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- The flexible attainment approach is being sold as a way to avoid EPA technical hurdles.

Academia

- Further discussion of attainment dates will not be fruitful. The core question is the extent to which a State shall be allowed discretion.

Federal Agencies

- The backstop plan should be developed by the customizing agency developing the core plan.

- There is not consensus on the recommendation that the structure is going to have to be tailored to individual States. Furthermore, there appear to be remaining issues that will not be resolved.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.19 Using Economic Incentives to Achieve Air Quality Objectives

Discussed at October 1996, and February, October, and December 1997 meetings.

The issues addressed by the NRSWG in its work on economic incentives have changed over time. Issues 1 through 9 below are those presented by the work group at the February 1997 Subcommittee meeting. Issues 10 through 12 were derived from the issue paper discussed again at the October 1997 meeting. Economic incentives also were discussed at the Subcommittee's December 1997 meeting. Generally, the NRSWG narrowed its focus as time passed from broad considerations of economic incentives to specific work on an analytical framework, early emission reductions, evaluation of a clean air investment fund, and finally on the broad areas where a degree of consensus could be reached.

This progression is reflected in the recommendations and Subcommittee discussions presented below.

Issue #1 What are the differences and similarities between emission trading programs and emission fee programs?

Issue #2 Which sources should be included in the program?

Issue #3 What is the correct geographic size for a market-based emission reduction program?

Issue #4 How should the design of an emission trading program incorporate the timing of emissions?

Issue #5 Should emission budget programs allow inter-pollutant trading? Should inter-pollutant trading of precursor emissions for one criteria pollutant be handled differently than inter-pollutant trading between criteria pollutants? How should inter-pollutant trading be managed?

Issue #6 In a program with an emission budget, how can the planning authority allocate initial allowances and allowances in future years?

Issue #7 How should the planning authority treat new emissions?

Issue #8 What mechanisms may be used to include area and mobile sources in incentive-based regulations?

Issue #9 How can planning authorities use economic incentives to address residual nonattainment?

Issue #10 Can a framework be developed to analyze different incentive-based tools for implementing an

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emissions control strategy that affects large stationary sources, area sources, mobile sources, or cross-cutting groups of sources?

Issue #11 What would a clean air investment fund look like and what are its benefits and disincentives?

Issue #12 How may States motivate sources to reduce emissions ahead of a mandated schedule?

Background

General

Economic incentives include emission trading programs, emission fees, and other financial mechanisms; time-savers such as special access to high-occupancy vehicle lane for car pools; and consumer information mechanisms. In addition, the CAAA of 1990 identify 16 specific transportation control measures as economic incentives. Compared to direct regulation, incentive-based regulation may hold promise for achieving necessary pollutant reductions with economy, certainty, timeliness, and equity. For example, the reasons for emissions trading include saving States' resources, less conflict with sources, letting sources determine the best/most effective control technology, focusing on emissions loading, increasing cost-effectiveness, and promoting control technology innovation and dissemination.

To be effective and cost-minimizing, economic incentives for air quality management must be tailored to the conditions that are specific to the pollutant which is being addressed and must be designed with specific goals in mind. The most fundamental determinant of the desired program is the goal or set of goals that provides the purpose of the program. The basic characteristics of the program will reflect choices: whether the program caps aggregate emissions or an emissions rate or is primarily intended to increase sources' efforts to reduce emissions; whether the program is intended to fully implement a pollutant control strategy or function as an adjunct to a strategy that is not essentially dependent on economic incentives; and whether the program is an area's approach to reducing background concentrations throughout an AOI or a local program that primarily reduces pollutant concentrations in a small area. In addition, for emission trading programs, the importance of adjusting the "currency" for source location and of imposing geographical restrictions on trading depend on the extent to which the location of a source relative to a particular receptor is one of the determinants of effect.

Ozone, PM, and regional haze are examples of air pollution problems in which the location of a source relative to a particular receptor is one of the determinants of effect. Costs may be reduced by using a more "refined" emission trading program than one in which tons are traded for tons without regard to the location of the sources. The basic emission trading program, such as the SO_2 Acid Rain Program, minimizes costs for an air pollution problem in which both the quantity of emissions and the location of sources matters. Different approaches may be more efficient for an air pollution problem in which both the quantity of emissions and the location of the sources matter. Many approaches—including adjusting the "currency" in emission trading programs—may be used to explicitly incorporate source location into program design.

Area and Mobile Sources

Throughout the nation, emissions from mobile and area sources are a substantial part of the emissions inventory. There are roughly 14 types of area and mobile sources, such as heavy-duty vehicles, marine engines, fuels, consumer products, wood stoves, and roads. These sources contribute to nonattainment with the NAAQS for ozone and PM, and they emit all precursors of concern (VOCs, NO_x), and primary PM. PM-2.5 consists of sulfate, nitrate, soil, organics, elemental carbon, and other substances.

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Emissions from area and mobile sources are regulated under multiple Federal, State, and local programs. Vehicle and engine emission standards, in-use emission detection programs, and fuel requirements control emission rates but not aggregate emissions of nonmethane hydrocarbons (NMHC), NO_x, PM, and CO from light-and-heavy-duty vehicles, nonroad engines, recreational marine engines, and lawn and garden equipment.

Resistance exists to the use of economic incentives or other incentive-based programs to reduce emissions from area and mobile sources. Fee-based programs, such as fees on emissions from passenger cars, are perceived to be inequitable because of the financial burden borne by low-income owners. Emission trading programs in which stationary sources may purchase mobile source emission reduction credits are perceived to be unjust because the local population's exposure is reduced less than if the source had increased on-site emissions abatement. More generally, incentive-based programs are perceived to be uncertain with respect to effectiveness and, regarding sources that burn gasoline, to provide less overall control of toxic pollutants.

NRSWG Framework for Analysis

The framework for analyzing the use of economic incentive mechanisms to achieve a desired emission control objective consists of four basic questions:

- What are the sources of emissions that one is concerned about?
- What opportunities does one see for controlling emissions from the sources of concern?
- What economic incentive mechanisms are available?
- What considerations must one take into account in engaging the process of matching the mechanisms with the source categories, and what are the opportunities for emission control within those categories?

Too often, the first two questions are asked without reference to the second. Decisions are made about source categories and control strategies without reference to the economic incentive tools available or the considerations that influence the feasibility of their use. Treating economic incentive tools as an afterthought limits their value; they become an appendage for achieving compliance flexibility rather than an engine for accomplishing the primary objective of the strategy, which is cleaner air. By asking all four questions together, one hopes to integrate thinking between the problem one is trying to solve and the tools available to solve it. This ensures that the end result is optimized to make the best use of the economic incentive tools at hand.

Basically the same opportunities exist for controlling emissions from area and mobile sources as for stationary sources: new equipment, turnover of equipment, repair/retrofit of existing equipment, activity (e.g., reduce or limit use), consumable goods (e.g., product substitution), and behavior change. After these opportunities are considered, there are three basic mechanisms for realizing emission reduction opportunities through economic incentives: emission trading, financial mechanisms, and consumer information mechanisms. As an initial matter, it may appear that certain economic incentive tools naturally match certain reduction opportunities. For example, it might be natural to assume that public education is the most appropriate tool to stimulate behavior change. However, it is not clear whether specific opportunities are unobtainable by certain tools.

The final section of the framework is the most challenging. If one believes that any opportunity can be achieved through any incentive mechanism, then the challenge in choosing a specific mechanism to match a specific opportunity is choosing the one that achieves the maximum benefit for the minimum cost.

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One must consider the intent behind the strategy, scope of the strategy, geography, quantification, information, enforceability, equity concerns, and resources.

The NRSWG developed four examples to illustrate the application of its analytical framework to mobile, area, and stationary sources: wood stoves, off-road gasoline engines, heavy-duty on-highway diesel engines, and large stationary sources other than electricity generating stations. As an illustration, the example on woodstoves identified the opportunities for economic incentives and available tools. It discussed the pros and cons of trading, financial, and consumer information mechanisms that would be applicable to reducing emissions from woodstoves. Similarly, more detailed analyses were presented for the three other examples.

Clean Air Investment Fund

The NRSWG gave special consideration to the establishment of a Clean Air Investment Fund. The fund would serve the fundamental goal of improving the economic efficiency of attainment plans. This goal can be achieved through one or both of two basic strategies. The first is to use the fund to stimulate the development of clean air technologies. Deficiencies in current capital markets result in under-investment in some desired technologies. The fund can correct some of these deficiencies, or market failures, by providing capital not otherwise available for investing in certain technologies due to the scale of the required investment, the delay in a return, or the degree of risk. The fund can also give local governments flexibility to seek out targets of cost-effective emissions reductions that, for one reason or another, lie outside of or are constrained by the regulatory system. The second strategy is to provide a compliance option for sources when control costs reach or exceed a designated cost threshold. Relative emphasis on one or the other of these two strategies reflects two models of clean air investment funds.

Under the first strategy, a State, region, Tribe or other entity could seek a high degree of participation in the fund by setting the fee level relatively low. This approach views the funding of new technologies and potentially the associated enhancement of private or public emission reduction credit markets as an integral part of an area's nonattainment plan, fully complementing the plan's control measures. Under the second, the fund is used more as a relief valve when regulated sources face high control costs. Under this latter strategy, fund investments are viewed as a last resort, allowing the area to obtain some emission reductions when more direct control options have proven too costly. Areas can structure programs with elements of both approaches.

The fund could be robust in the short term but the private credit market would probably take its place in the long term. To implement the fund, a State, Tribe, local government, or regional entity should design the fund to meet its individual needs. Prices could be different from region to region and set by the implementing jurisdiction. A State also has the option of setting a benchmark first. States, Tribes, and local governments will need to decide who has the option of paying into the fund and how payments should be used. Determining the relationship between the fund and the SIP review process will depend on whether the implementing jurisdiction uses the fund in raising revenue or as a relief valve.

Early Reductions

The NRSWG discussed general issues that are important to address when developing a program to achieve early emission reductions, i.e., actual pollution reductions that occur ahead of a schedule mandated by regulation or statute. The work group also suggested general types of incentives for this purpose: safe harbors and a trading system with banking.

The work group focused its discussion of general issues and related recommendations on baselines and the assurances sources may require to participate in early emission

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reduction programs. Because early reductions are measured against a baseline showing mandated emssion reductions, EPA should determine the rules for establishing baselines to ensure uniformity in States' early reduction programs. To avoid negative incentives, early reduction programs should provide assurance that the sources who voluntarily reduce emissions ahead of schedule will be treated equitably if a State imposes mandatory reductions.

The work group sees banking and trading programs as a potentially useful approach for obtaining early emission reductions. These programs provide opportunities for early reductions to all market participants who for whatever reason see advantages from such actions. If States do establish cap and trade programs, they should establish caps that can be modified based on an evaluation of emissions under the program. If emissions are too high, the cap can be tightened, and the value of banked emissions increases. Sources expecting this outcome therefore have more incentive to make early reductions.

Recommendations from the NRSWG

The work group provided several general recommendations.

EPA should develop and adopt an analytical framework and a specific policy allowing demonstration and pilot projects for incentive-based programs that reduce emissions from area and mobile sources. Economic incentives should be considered as a control opportunity on equal footing with other control strategies. They are valid even though they are not SIP-creditable. The interim period and new attainment area concepts will provide opportunities for experimentation. Economic incentives should be included. Special consideration should be given to establishing a clean air investment fund.

Discussion by the Subcommittee

Following is a summary of selected comments on economic incentives, with specific reference to the analytical framework, from the October 1997 meeting. It is followed by a summary of selected comments about the Clean Air Investment Fund from the same meeting.

Finally, there is summary of the Subcommittee's discussion on economic incentives from its final meeting in December 1997.

Economic Incentives

States and Tribes

- There is a question about whether the work group expects noncompliance with existing requirements. The response is that they will need to strike a balance between trying new things while not incurring damage if the new approach does not work.
- Pilot programs are very important to support the common sense initiative. Municipal energy efficiency programs are a source of ideas that can be borrowed. They could have multiple benefits. Some of these recommendations are already in California's SIP.
- States should be encouraged to experiment and see what works.

Industry

- EPA should establish a commitment to voluntary programs. They often turn into mandatory controls and undercut voluntary programs.
- The reference to a tax on new woodstoves does not make sense; taxes should apply to old, less efficient equipment. Other incentives such as property tax credits could be used.
- Two types of mechanisms, rewards and punishments, should be categorized differently because they are different mechanisms to get to the same point.
- The program must be integrated. The same program can reward and punish.

EPA should watch for counter-productiveness within programs.

Environmental/Public Interest Groups

- The woodstove issue needs to be directed at industrial wood-fired stoves as well as residential sources.

Clean Air Investment Fund

States and Tribes

- It is hard to see how this fund will work based on some State experiences under the current system. It will be a tremendous shift to a fluid planning procedure.

- The SIP assumes attainment of a certain compliance level. There is concern about how this approach will fit into the current system. The response is that there are many assumptions in SIPs. This is a blank check and should tell the public that SIP investments are cost effective.

- The $10,000-level mentioned in the Presidential Directive should not be used to tie States' hands.

Industry

- The fund as a relief valve is valuable. It offers an advantage if the costs of control are high or if a timing problem exists for a facility. The fund must produce measurable emission reductions in an area to justify its existence. The funds should be concentrated locally and produce local benefits.

- The fund should be directed toward emission reductions. A State must decide what to do with the Fund. If clean air does not happen, a public debate can occur.

- The concept of local government setting values is interesting.

- There could be equity issues with manufacturing plants because processes among them are so different.

- The fund approach will be resource intensive.

- What about the impact of AOIs, AOVs, and transport on interstate commerce.? The response is that the impact could be cost effective.

- There is concern about whether there is a value like the direct sale under Title IV. The response is that this is not a FIP; States will develop private party options.

- Prefunding allows for credits where there are real reductions but the credits are not included in the SIP. There is a bank to use the fund, but there is a limit to the credits that are in the bank. As it matures and the funds are disbursed, the fund is restored. It is always being replenished and there is less risk to the public. Surplus credits must be available to prefund. Compliance relief will be lost if the surplus funds are not available.

Environmental/Public Interest Groups

- There are questions about whether the fund will be used to achieve equivalent environmental performance and used by a government entity to make up for emission reductions. The response is yes. There will be lower transaction costs in early years, then private markets will join in. The first priority of the fund is to reduce emissions and deal with shortfalls.

- The costs of moving to different types of cars can be underwritten by States. They should look at how funds can get into market failures and take risks when the private sector is not willing to assume risk.

- A New Hampshire proposal has dirty industries paying clean ones. The advantage is that the government picks investment opportunities. This would be easy with mobile sources by setting differential registration fees.

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Federal Agencies

- It is important that payments be used to reduce emissions. Public health will be affected. The burden is shifted to the States, and the public will feel the impact.

Following is a summary of the Subcommittee's December 1997 discussions.

States and Tribes

- An interesting aspect of the SO_2 program has been the drop in the price of credits. A question has been raised about whether the price of credits will be driven down because of improved technology and economic growth.

- Procedural points are raised about the Subcommittee's goals for consensus on economic incentives. To one State representative, the recommendations seem almost too broad.

- Concerns are voiced that in addition to a State following its own rules when it has a nonattainment area, it might also be required to develop the regulatory mechanism to implement a market trading system.

- EPA has been asked to clarify its position on trading and economic incentives. The target emission trading programs already underway in California were cited, but it was noted that many stakeholders did not want to participate in them.

- There is a question raised about whether one could measure the different environmental benefits of incentive programs.

- There is disagreement over whether States should be required to look at tools for economic incentives or whether economic incentives should be only an option.

Industry

- There is confusion about whether credit would be given for a source to go beyond future requirements. The response is that it was a system design and regulatory decision maker's choice as to when credits were taken.

- A questions is asked about whether modernization of facilities would qualify as an early reduction, assuming the modernization would achieve a net reduction of emissions below the baseline.

- There has to be adequate time and incentives for an early reduction program to work.

- With an emissions trading program there needs to be consistency and leadership from EPA. Currently, considerable confusion existed regarding trading programs.

- For an economic incentives program, one will not have to show any greater assurance of meeting a percent effectiveness rule than in the case of a command-and-control approach.

- Credits should be granted with contingencies on performance.

- There are going to be cases where it does not make sense to consider economic incentives. Economic incentives should be only one option where appropriate.

- They should not have a lot of the same programs being tested by different States at the same time. EPA should consider preparing a list for States to consider of programs it would like to see tested.

Environmental/Public Interest Groups

- A concern is raised about whether there would be a change in EPA policy that would encourage SIP credits for untested innovative programs.

- A representative of an environmental group is not sure that metrics were available for determining equivalency.

Academia

- A question is raised about what would happen when the United States experienced economic recession, and whether the baseline for the banking program would be absolute or expressed in terms of historical emission levels.

Federal Agencies

- Sources may aim low when trying to qualify for a "safe harbor" early emission reduction program even though they could make greater reductions.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.20 Reasonable Further Progress (RFP)

Discussed at February, April, and October 1997 meetings.

Issue #1 Should RFP be standardized nationwide or can RFP be customized at the AOI/AOV level?

Issue #2 What is the range of options for the RFP metric?

Issue #3 How frequently should RFP be demonstrated?

Issue #4 What is the base year for RFP?

Issue #5 What would be the rate of RFP?

Issue #6 How should end-loaded strategies be handled in RFP? How much of the emission reductions required for attainment may be end-loaded strategies?

Issue #7 What is the corrective mechanism to get an area back on track when the area has failed to meet an RFP milestone?

Issue #8 Can emission reduction measures that are not fully enforceable, quantifiable, or permanent be credited in the RFP emission reduction metric?

Issue #9 What parts of the RFP requirements for ozone and PM-fine should be integrated with the reasonable progress requirements for regional haze?

Issue #10 Under what circumstances, if any, should an area be allowed to avoid demonstrating attainment? If there are such circumstances, what will constitute RFP?

Issue #11 Who is responsible for performing the next steps in the iterative RFP process when an inter-jurisdictional area fails an RFP metric?

Issue #12 Should RFP be specified for each source sector?

Issue #13 Should RFP be measured as seasonal or annual?

Issue #14 Can RFP include mandatory measures outside of Title I (e.g., national programs such as Titles II, III, and IV)?

Issue #15 Should there be specific procedures to determine if RFP has been achieved?

Issue #16 How does RFP relate to the secondary standards?

Background

States are required to meet the NAAQS for ozone and particulate matter in nonattainment areas. RFP is a tracking

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system used to assess the progress of SIPs toward meeting the NAAQS. There are two schools of thought on how RFP can be assessed. The first defines RFP as the demonstration of timely progress toward the NAAQS. Under the first model, RFP is made up of the milestones along the path toward attainment. The second model to assess RFP views RFP as the incremental improvement in air quality to reduce exposure to unhealthy air. This second model uses air-quality related indicators such as emissions inventories or ambient air monitoring to assess RFP. The driving force behind this model is the belief that an area cannot make up for lost time in terms of air quality.

Recommendations from the NRSWG

1. Local airshed authorities should determine which precursors are to be reduced to meet RFP goals. No consensus exists regarding the need for an EPA-mandated percent reduction approach.

2. RFP should be an iterative process requiring States or areas to review their progress toward attainment at fixed intervals. A workshop for technical experts of all stakeholder groups should be convened to address issues related to air quality metrics, monitoring and data quality requirements, and improvements in emission inventories. This workshop should be held by December 31, 1997, or as soon as possible thereafter.

3. There was no consensus on this issue. Industry preferred a customized approach while environmental, public interest, and State representatives preferred a standardized approach.

4. Consensus could not be reached on whether the base year should be fixed nationally or variably based on when an area determines its attainment status.

5. Consensus was not achieved. However, the range of options has been narrowed to three that provide for a less prescriptive approach to setting the rate of RFP.

6. End-loaded strategies should be allowed as part of a multi-strategy emission reduction program and tailored to the unique needs of an area. Enforceable administrative measures to track RFP will be needed. These strategies can be included in the menu of options when determining which strategies to incorporate in an RFP demonstration. Any application of an end-loaded strategy needs scientific support to ensure the emissions reductions that occur will improve air quality.

7. Consensus exists on an iterative RFP process that functions as a general mechanism to handle failure to meet an RFP milestone.

8-10. No consensus was reached on these issues.

11. While the SIP will remain the primary vehicle for identifying and implementing emission reduction programs, increasingly it is expected that interstate agreements such as memorandums of understanding will play a role in solving interstate pollution problems. It is strongly recommended that, during the RAMP and RIP development process, thorough discussions of next steps and possibilities for interstate programs should take place and be described in the relevant SIP.

12. No consensus was reached on this issue.

13. This issue is not a RFP issue. Rather it is related to the control strategies (June 2, 1997) and the emissions inventory and modeling (June 2, 1997) issue papers for developing the control measures and performing the analyses.

14. No consensus was reached on this issue.

15. The workshop recommended under Issue 2 should identify enhanced procedures for determining whether the RFP

emission reduction metric has been achieved.

16. No consensus was reached on this issue.

Discussion by the Subcommittee

Following is a summary of the Subcommittee's discussions at the February 1997 meeting.

States and Tribes

- There has to be a way to acknowledge longer-term strategies, such as the control of urban sprawl. Whenever a multi-year attainment demonstration is developed, there are long-range options that will take effect in out years.

- It is misleading to use ozone reductions as a metric because ozone is caused by precursors. Using ozone reductions as a metric really does ignore meteorological variability.

Industry

- AOIs or control regions will develop regional implementation plans and those plans will contain reduction goals that move the region toward attainment. Once the reduction goals are defined, then the requirements to get those reductions will be the responsibility of that regional jurisdiction, which also will be required to implement RFP.

- RFP should be customized; there should be flexibility and the ability to take any available credits at every locale.

- With regard to meteorological effects, RFP has to be related to demonstrated reductions in emissions and not to ambient air quality data. The choice is to apply an emissions magnitude metric or require averaging of ambient data over longer and longer time periods.

- The base "year" for RFP should be made up of multiple years.

- There should be a cost cap on RFP control demonstrations.

- A good metric might be a cumulative cap on the cost of investments in achieving emission reductions.

Environmental/Public Interest Groups

- Concerns are raised about the delays that are expected for implementing the PM standards.

- Concerning the question of whether there should be ways to get out of RFP if attainment proved infeasible, the commenter does not think that infeasibility is a sufficient reason for not proceeding with the next step.

- The issue paper did not address options for areas that are dirty now and would continue to be dirty under the new standards. To simply say no backsliding in the pre-SIP phase is not an acceptable alternative to requiring those areas to begin their work on attainment.

- Rate of progress could be measured as an annual percentage reduction along with a reduction on a straight line toward attainment. Agreement is expressed for the idea that in the pre-SIP period, an area had to maintain the progress outlined in the current CAA. The concept of nonattainment areas has not been abandoned.

- Procedures should be spelled out for determining when RFP had been achieved. It is too easy for States to predict that they would achieve RFP and then simply submit a new plan when they fail to make that achievement.

Federal Agencies

- There are questions about AOIs, AOVs, RAMPs, and whether it will be AOIs or AOVs that have the requirement for RFP.

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The following summarizes the Subcommittee's discussions at the April 1997 meeting.

States and Tribes

- Emissions reductions by themselves often are not enough; the right reductions are taken at the wrong locations or the wrong reductions are made. They have to have both emissions reductions and air quality assessments. Targeted reductions might not yield the necessary air quality improvements; there could be a need for a totally different approach to emission reductions based on improvement goals. Questions are raised about whether the tools exist to evaluate the changes in air quality from year to year.

- There is a fundamental problem with using air quality on equal footing with emissions reductions because of the lack of a metric for measuring air quality improvements. RFP needs to be tied directly to quantifiable reductions in emissions. States support the use of quantifiable metrics that they can control, not something as variable as air quality goals.

- States currently are evaluating both emissions and air quality to see whether they are making progress and it is a very frustrating process. There are variables, such as meteorology, that are outside of regulatory control. The Subcommittee needs to consider these things when evaluating effectiveness. For emissions reductions, States set a base year and then work off of emissions inventories for several years beyond the base. There needs to be a way to reset the base and not hide problems or gains.

- Some provision is needed to recognize the effects of the new standard on the attainment date and classification process. For example, Southern California currently is classified as an extreme ozone nonattainment area. Under existing law, it has until 2010 to reach attainment. Under the proposed changes, it will have to meet the more stringent standard by 2009. Without its classification as extreme nonattainment, it is unclear what progress goals still will apply.

- Economic viability should not be excluded from the discussion of RFP, especially in California.

Industry

- Metrics are important but the Subcommittee should not lose sight of the importance of implementation.

- The Subcommittee should keep focused on finding a metric for measuring air quality improvements.

- A clean air fund could function as an "off ramp"; that is, if one's costs of control are higher than some benchmark cost, one pays into the fund rather than paying for additional controls. The fund then could be used by government to fund emissions reductions in other areas using other methodologies. The off ramp will avoid the requirement for very costly control measures and also will avoid the situation where one will not consider the efficacy of expensive control measures because their cost will ensure that they never will be implemented.

- Economic vitality should not be an issue in determining RFP; economic issues should be outside the discussion of RFP. If an area is in economic decline, its emissions inherently will be reduced and it will be making its goals.

- There needs to be a cut point at which one can say there is nothing else to be done to reduce pollution. Some criteria should be developed for when the 3 percent per year rule simply does not work.

- There are real achievability problems for ozone and possibly more serious ones for particulate matter. There should be customized, iterative processes for determining RFP that recognize these problems and their different effects in different parts of the country.

Environmental/Public Interest Groups

- There is concern over setting up customized processes for areas that are not likely to attain. Many areas will be put into this category and will have attainment processes that are doomed to failure. The problem with customized processes is that many areas will defer emissions reductions to the very end; by the time it became apparent that they will not attain, it will be too late.

- A methodology for determining whether emissions reductions has been achieved needs to be spelled out very clearly in EPA guidance on SIPs. Successes should be documented sector by sector. States need to lay out exactly how required emissions reductions are going to be met.

- The goal should be to attain the standard, not to have a sufficient alternative if one did not achieve attainment. Regarding interim air quality goals, questions are raised about whether one will set air quality objectives and then determine the interim emissions reductions or whether one will set emissions reductions and then determine what the subsequent air quality changes should be. An area should have to pass both air quality and emissions reductions tests. Better-than-expected air quality improvements should not provide a reason for slacking off on emission reductions.

- The issue of involving cost is a concern. There is an historical tendency to overestimate the costs of control. Sometimes one has to use measures that are expensive because of the severity of the problem. It is a fact of public health and environmental justice. Controls should not be rejected because of their expense; the costs to public health are still there as long as air quality remains poor.

Federal Agencies

- The effects of meteorology should not be factored out in determining RFP.

- Economic growth in a community should not affect RFP. When communities are growing, they should be required to keep air quality goals as their focus.

Following is a summary of selected comments of Subcommittee member at the October 1997 meeting.

States and Tribes

- It is impressive that there is any consensus at all on these recommendations.

Industry

- Lines of consensus on the recommendations are often drawn between stakeholder groups.

- Although the determination must be EPA-approved, EPA will not know better than local authorities and will not be able to indicate precursors nationwide.

- There will be a Federal backstop to prevent exhaustive negotiations; it will be the menu from which control strategies are chosen.

- As long as there are RAMPs, secondary standards and regional haze should be considered.

- Since most PM-2.5 comes from area and mobile sources, the Subcommittee must look at factors other than annual emissions. However, mobile and area sources reductions will be difficult to measure.

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Environmental/Public Interest Groups

- It is disappointing that there is not more agreement on the recommendations. This is an important area for EPA to resolve. Splits on the issues are drawn on predictable lines.

- Customizing in a local area and letting the local airshed determine precursors are not necessarily good ideas. Environmental representatives question what will happen if the locality is technically wrong in choosing its precursors.

- There are questions about whether interstate strategies will be defined by SIPs and be the product of multi-State discussions. Also, there are concerns over what will keep an upwind State from saying a downwind State is responsible for pollution. The response is that the work group assumes there will be a RAMP or AOI/AOV in place. Up front, the RAMP or a multi-State program will assign responsibility, the States will collectively agree on proportions, and it will be addressed in the SIP.

- Progress must be guaranteed by Federally or State-adopted backstop measures.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.21 Reviewing New Sources of Air Pollution Prior to Construction

Discussed at September and November 1996 meetings.

[Official Name: *New Source Review: Considerations for the Implementation of New Air Quality Standards/Regulations*]

Issue #1 How can a new integrated implementation policy address new source controls in a cost-effective way considering the likelihood of geographically large control areas and AOV/AOI designations?

Background

The NSR policy has been a cornerstone of control programs in nonattainment and Class I areas for nearly 20 years. The policy is linked directly to the current nonattainment designation process. The process for defining new source requirements must be changed if new designations are to be based on AOV/AOI subject to a SIP. The designation approach based on AOV/AOI may result in large areas within which new source controls should be required, but it is possible that specific sources or emissions from particular locations within AOIs may not contribute equally to measured standard violations in the associated AOVs. Therefore, the BPAPWG and NRSWG also are considering options that will serve to maintain cost-effective and competitive opportunities within these potentially large AOI areas in this review of the new source issues.

Recommendations from the NRSWG

Four options were presented in the issue paper, although the work group recognized that these options do not encompass all possible approaches that could be considered. The options were:

1. The same planning and control requirements would be required for all new and modified major stationary sources in all AOIs. The advantage of this approach was that it was simple and offered no arbitrary siting benefits within the AOI. The disadvantage was that it conflicted with the intent of the AOI/AOV concept and might be less cost effective than other options.

2. Some specific control plan for new and modified sources would be required within all AOIs, but the SIP could require different planning and control require-

ments to differentiate strategies applicable to specific locations and sources within the AOIs. The advantage was that it would allow flexibility in cases where it could be shown that not all sources in the AOI contributed equally to measured violations.

The disadvantage was that it might result in some areas of an AOI being less competitive than others in the same AOI. This option might also include a mechanism to allow individual sources to challenge specified controls.

3. New and modified sources in an AOI that comply with new source performance standard (NSPS) and demonstrate offsets within the AOI would not be subject to prevention of significant deterioration (PSD) requirements for the offset pollutants. The advantage was to reduce the burden in the permit process; while offsets may be required, sources might not be required to implement LAER. The disadvantage was that it was complex, might fail to protect PSD increments, and might result in higher emissions in some local areas.

4. Allow flexibility to determine the scope and breadth of the new source strategy within AOIs and implementation of a trading and banking system to obtain offsets and meet other new source requirements within an AOI. The advantages are that a system based on cap and trade will reduce emissions and promote cost efficiency. This option also could be expanded to include inter-pollutant trading.

- The work group said it would focus further consideration on options 2 and 4 and include variations such as inter-pollutant trading.

Discussion by the Subcommittee

At the November 20, 1996, Subcommittee meeting, the work group presented an update on its work but not a revised issue paper.

Work group members wanted to make it clear that they were trying not to duplicate any work by the Subcommittee established to investigate NSR. Their approach was to maximize the cost effectiveness of integrating NSR into the AOI/AOV structure, while providing flexibility to reflect regional differences. The work group noted that the NSR program should result in real reductions using market principles where appropriate. They also presented information on three technology floor options: retain NSPS as the floor; select BACT as the floor, or designate another technology as the floor.

Also at the November meeting, an overview was presented of the current package being considered by the NSR Subcommittee. That Subcommittee looked at four categories of rule changes, including applicability, technology, Class I areas, and applicability of the 1990 CAAA.

The Subcommittee discussions at its November 1996 meeting followed a session in September where the Subcommittee discussed new sources and the options that might serve to replace NSR for nonattainment areas with a cap and trade or declining cap and trade program over an entire AOI. The following selected highlights are drawn from both the September and November meetings.

States and Tribes

- NSR should not be eliminated totally in favor of a cap and trade system.

- NSR is a known program, and the certainty of knowing what was expected gave both States and industry some degree of confidence that sources could locate and grow near urban areas.

- Some of the sources that could require controls in the future are area or fugitive sources that might not be included in a cap and trade program.

- NSR and LAER will still make sense for new sources since it is always more

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cost effective to add the best possible controls during the construction phase rather than as retrofits. The cap and trade concept might then be applied to existing sources. Removing the requirement for LAER during construction might eliminate some control opportunities at a later time.

- The problem with NSR is the time it takes for approvals, not the fact that LAER was required.

- There needs to be a minimum performance-based approach to NSR while seeking flexibility in the market, such as option 2 with BACT as a technology floor.

Industry

- A cap and trade program to modify the existing NSR process is desirable.

- The rigidity of LAER and NSR at times prevents innovative solutions.

- Determinations for LAER should be negated only if they would inhibit a robust trading market.

- The success of a cap and trade program will require more political will than buy-in from sources, and the only way to get the political backing is to demonstrate that it is the least-cost option.

- Achieving the new more stringent standard using traditional control strategies will be extremely expensive.

- The discussion of NSR should be tabled until there is a better idea of what the market program would be.

Environmental/Public Interest Groups

- The NSR program should be retained to promote the maximum amount of emissions reductions. It has been very effective in limiting the growth in emissions to rates that are much lower than the growth in industrial activity. Based on that success, the NSR program should not be discounted or scrapped.

- Controls are needed on fugitive sources, which might not be addressed adequately by a cap and trade program.

- The issue paper fails to address programs for the transition period or the need to consider specific hot spots.

- With all of the uncertainty over the adequacy of control programs, a combination of NSR and a cap and trade program should be considered as a strategy to encourage maximum emissions reductions from the maximum number of sources.

- The NSR proposal is trying to improve the function of the Federal Land Manager and provide clarity in dealing with air quality-related values. This proposal is inconsistent with the provisions recommended to eliminate PSD.

- The terminology should be changed to reflect a technology-based performance standard, not a technology floor.

- When technology-based programs work well, they produce innovation.

- Although NSR programs can be expensive, any additional costs for controls have to be considered in light of the significant and rising costs associated with health problems in highly polluted areas.

Federal Agencies

- The concept of leaving PSD and some other details as Phase II issues to be addressed later is discomforting.

- The level of detail proposed here might interfere or contradict the separate NSR reform process.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.22 Opportunity Matrix for Ozone, Fine Particulate Matter (PM-fine), and Regional Haze Integration

Discussed at April 1997 meeting.

Issue #1 Is a matrix of control strategies useful in consolidating information on ozone and particulate matter into one table to identify opportunities for control and to show cross-cutting benefits of different control measures?

Background

The Opportunity Matrix was developed by the NRSWG to support discussions surrounding integrated implementation and control strategies.

Issue #1 Is a matrix of control strategies useful in consolidating information on ozone and particulate matter into one table to identify opportunities for control and to show crossing cutting benefits of different control measures?

It is a way to examine opportunities for reducing emissions that provide benefits across different pollutants. The Matrix gives a list of suggested national measures as well as suggested prescribed measures that the Subcommittee should consider and potentially recommend to EPA. The control opportunities presented in the matrix can be implemented as traditional command-and-control or incentive-based strategies. The Matrix is organized by source category codes and presents source category emissions from the 1990 National Emissions Inventory and control opportunities under each category. It also gives the relative control efficiencies for primary PM-fine, sulfur oxides, ammonia, nitrogen oxides, and VOCs. Data for the Matrix came from various sources including: OTAG, GCVTC, STAPPA/ALAPCO, NAAQS background documents, OMS, States, and European studies.

Recommendations from the NRSWG

The NRSWG recommended that the Matrix supplement the work of other groups. It should be used to identify co-benefits and potential downsides of possible controls, including national measures. In the future, information on costs may be developed and added to the matrix.

Discussion by the Subcommittee

Following is a summary of selected discussions about the Opportunity Matrix from the April 1997 FACA Subcommittee meeting.

States and Tribes

- States that have developed SIPs have already gone through the exercise of creating control strategy lists; the work group should go to the States and build on their knowledge. There were some categories that needed to be added to the Matrix, such as small businesses.

Industry

- Data from the 1990 inventory might not be adequate. There should be a projected inventory that takes into account more recent rules. The emissions estimates are based on uncontrolled sources; most industries already have controls in place.
- If the chart is an organizational tool, then it definitely needs to be prioritized on the basis of cost or pollution reduction efficiency.
- In creating the Matrix, the work group should not try to anticipate facility-specific costs. It should be a general tool.
- The Matrix will be helpful in integrating pollutant controls.
- Without the 2007 inventory included, the Matrix is not helpful. It needs to identify technologies that are already in place first, then provide a menu of options related to the 2007 inventory.

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- Modeling will be needed to determine which control strategies will have the greatest impact on overall air quality.

Environmental/Public Interest Groups

- There are questions about how one will deal with existing point sources that affected ozone, PM, and regional haze, and how one will make hierarchical control decisions.

- The Matrix is only an orientation document that shows there are techniques that cross pollutant boundaries. It should be left at that.

Labor Interests

- The key variable in considering a control strategy are not raw cost in dollars per ton but rather its impact on employment. Employment is tied directly to public health, and a large negative impact on employment is in fact a large disbenefit to public health. The Subcommittee needs to be thinking about control strategies that will ensure public health. The Matrix is very helpful because it shows people that EPA is thinking about how to reduce emissions levels and possible impacts.

EPA

- It is unclear where the work group intends the Subcommittee to go with the information in the Matrix. There is concern that there will be a debate about costs if cost information is added. The response is that the work group only wanted to identify places where there were opportunities for reducing emissions of multiple pollutants. They were trying to avoid the detailed discussion of cost.

- Concern exists that the Subcommittee will be sidetracked and lose its focus on regional and national control measures that need to be implemented. They could get bogged down in doing a cost analysis for an individual control technology and delay the Subcommittee process.

Other Federal Agencies

- The Matrix should provide a column for including multiples uses of technologies; for example, burning is a disease- and pest-control function in agriculture.

- Control technologies included in EPA's baseline controls should not be included in the Matrix.

- The benefits of the control strategies are well documented. However, the disbenefits have not been reviewed adequately, especially with respect to integrated implementation.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.23 Implementation Strategies for Contingency Measures

Discussed at June and October 1997 meetings.

Issue #1 Should contingency measures be episodic and should episodic contingency measures be included in the core measures for the SIP?

Issue #2 To what degree should voluntary measures be included as contingency measures?

Issue #3 What is the timeframe for adoption of contingency measures in newly designated nonattainment areas? Will comparable separate submittal dates be allowed for the new or revised standards for ozone and PM-fine as well as regional haze?

Issue #4 Is an area that implements contingency measures early, to avoid a violation of the new or revised standard, required to backfill with additional contingency measures?

Issue #5 Could a contingency measure be used to expand the area of an AOI and broaden the applicability of the control measures within the AOI?

Issue #6 Will contingency measures for visibility be required for Class I areas?

Issue #7 How much emission reduction or air quality improvement is required for contingency measures?

Issue #8 Should there be a mechanism to allow substitution of equivalent measure(s) in lieu of SIP-planned contingency measures?

Issue #9 Should measures that were used by an area to bring it into attainment be dropped from the maintenance plan?

Issue #10 Should there be Federally prescribed contingency measures for attainment and/or maintenance plans?

Issue #11 How should contingency measures be addressed in the situation where a SIP is unable to show attainment and there are no feasible core measures available to bring the area into attainment?

Issue #12 Should contingency measures be implemented early if it is determined that, in the spirit of attainment "as expeditiously as practicable," the contingencies will cause the area to attain sooner than if just the core measures were implemented?

Issue #13 Should the only contingency measures be planning requirements (i.e., no additional control requirements)?

Issue #14 Should alternative contingency measures be developed to account for various air quality outcomes?

Background

There are two purposes for contingency measures used in a SIP program. First, contingency measures are used to promptly correct a violation of the NAAQS in a maintenance area after attaining the standard. Second, contingency measures are used to assist a nonattainment area in meeting RFP or to attain the NAAQS by a certain date [Section 172(c)(9) and Section 182(c)(9)]. The contingency provisions in Subpart 1 [Section 172(a)(9)] are the general contingency measures and apply to all SIPs for criteria pollutants. The contingency provisions found in Subpart 2 [Section 182(c)(9)] are part of the CAAA of 1990 and apply only to those SIPs for ozone nonattainment areas under the current 1-hour standard. Subpart 2 is very specific about the attainment dates and rate of progress to be achieved under the attainment plans for ozone nonattainment areas, but the 1990 CAAA do not specify how many contingency measures are needed or the magnitude of emissions reductions to be provided by these measures.

The general preamble to implement Title I of the CAAA (57 FR 13498) provides the necessary specificity to enable areas to develop approvable plans with appropriate contingency measures. According to the general preamble, contingency measures are required to ensure, at a minimum, that an appropriate level of emissions reduction progress will continue to be made if attainment of RFP is not achieved. Under the worst case scenario, if there is a complete failure to achieve RFP (i.e., 3 percent per year), then the contin-

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gency measures need to be sufficient to make up the entire increment. In the more likely case of only partial failure, the State can then select from the slate of contingency measures, those measures that would make up the shortfall. It is clear that Subpart 1 applies to all criteria pollutants, including those for which standards are promulgated after the effective date of the 1990 CAAA. It is less clear as to the applicability of Subpart 2 to new/revised standards. In fact, the case could be made that Subpart 2 and the current general preamble, with their reference to progress by specific dates that already have elapsed, could not possibly be applied to a new or revised ozone standard, and that RFPs and attainment dates under new or revised standards must be addressed by new rule making.

Historically, contingency measures have been defined as specific measures to be undertaken if a nonattainment area fails to make RFP, or to attain the NAAQS (i.e., ozone or PM-10) by the applicable attainment date. These contingency measures are included in a State's SIP. Reductions must be achieved in the year following that in which the failure is identified. Under Subpart 2, ozone contingency measures must be fully adopted rules or measures. The measures do not have to be implemented unless and until they are triggered either by failure to meet a milestone in RFP or to attain the NAAQS. The SIP should clearly state the trigger mechanisms, a schedule of the implementation of the measures, and an indication that the measures will be implemented with no further action by the State or EPA. Contingency measures prior to November 15, 1996 (pre-1996) had to address VOC reductions while post-1996 contingency measures could address reductions for VOC and/or NO_x. EPA allows for the post-1996 contingency measures to provide for less than 3 percent in VOC reductions as long as the difference is made up in NO_x reductions.

When a State submits a request to EPA to redesignate a nonattainment area to attainment for a particular pollutant, the package must contain an approvable maintenance plan. The maintenance plan constitutes a SIP revision and must provide for maintenance of the NAAQS in the area for at least 10 years after redesignation. Eight years after the original redesignation request is approved, the area must submit a revision to the SIP to provide for maintenance of the NAAQS for an additional 10 years following the first 10-year period. The maintenance plan contains contingency measures to ensure prompt correction of any violation of the NAAQS that might occur after redesignation to attainment. When the redesignated area has violated the relevant NAAQS, contingency measures listed in the maintenance plan are invoked to make prompt corrections that will bring the area back into attainment. Areas always in attainment with the NAAQS are included in the maintenance SIPs submitted to EPA in 1972. As a rule, these SIPs do not include contingency measures to correct any violation of the standard.

The full issue paper on contingency measures was completed in July 1997. A follow-on paper was drafted to meld contingency measure issues, backstop concepts, and alternative frameworks for control strategies, and to address how contingency measures might work in light of what the Presidential Directive says about transitional areas and areas that do not qualify for transitional status. The Presidential Directive calls for common sense, flexible, and cost-effective approaches to implementation of the new and revised standards while maintaining progress toward cleaner air. It also recognizes that the provisions of Subpart I will still govern the ultimate implementation.

The work group agreed on the following issues:

- All areas ultimately declared nonattainment or transitional must make real, quantifiable progress and meet the statutory deadlines.

- Contingency measures should be the true backstop.

- Consequences of continued nonattainment will be addressed according to the provisions of Section 179(d).

Recommendations from the NRSWG

Following are recommendations made by the NRSWG on contingency measures.

1. Episodic measures should be allowed as contingency measures to the extent that emission reductions are quantifiable and enforceable, and the measures satisfy the restrictions of 40 CFR Part 51 regulations. Serious consideration should be given to the premise that if episodic measures are part of a full seasonal effort to reduce emissions, they are not excluded from consideration.

2. Voluntary measures should be allowed as contingency measures but they would initially receive less emission reduction credit than enforceable measures. Determination of initial credit must be conservative so that the actual emission reduction benefit or air quality improvement is not overestimated. More credit should be given retrospectively after such measures have proven their emission reductions. There should be a distinction made between voluntary measures that are part of an economic incentive program and those measures that are strictly voluntary.

3. Contingency measures need to be adopted when the SIP is first developed, so they can be implemented quickly once it is determined that an area has failed to make reasonable further progress. The contingency measures must be able to keep the nonattainment area on track toward attainment, according to the customized rate of progress identified in the Subgroup's alternative framework or according to the nationally standardized "RFP metric" identified in the issue paper on RFP. There must be sufficient collective credit from the menu of contingency measures to replicate the entirety of emission reductions needed to achieve timely progress and attainment.

4. As the state of knowledge increases about the emission sources that primarily contribute to a nonattainment problem, contingency measures other than the ones initially adopted in the SIP may be more effective in achieving reasonable further progress and timely attainment of the revised NAAQS. There should be an opportunity to substitute equally or more effective contingency measures for the original contingency measures. An assured opportunity for substitution may relieve some of the anxiety associated with having to identify contingency measures in the SIP. SIPs for these areas must still include contingency measures. Cost-effectiveness benchmarks may be used in order to draw the line between core SIP measures and contingency measures, keeping in mind that all reasonably available control measures must be implemented as core measures. The opportunity for substitution is available to these areas. The problem remains for these areas that an implementation plan under Subpart 1 of the CAA cannot be approved unless it demonstrates attainment of the NAAQS. The work group suggests considering possible remedies, other than sanctions, for these areas.

5. A commitment merely to do planning mid-course would not be an acceptable contingency measure. This concept would go against the principle of having enforceable, quantifiable reductions in the SIP to ensure rate of progress. However, this principle would not preclude a mid-course reassessment and substitution of other measures.

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6. There are three scenarios under which areas might qualify for transitional classifications:

    - Areas that can show attainment solely through regional emissions reduction.

    - Areas that require both local and regional measures

    - Areas that require strictly local measures.

    7. Four circumstances exist under which a transitional area might fail to meet attainment deadlines:

        - If EPA fails to implement national measures in a timely manner and States are relying on these emission reductions, EPA should implement pre-adopted national contingency measures.

        - If national measures do not achieve the projected air quality benefit, EPA should implement pre-adopted national contingency measures.

        - If the State fails to implement measures in a timely manner, sanctions or a pre-adopted Federal Implementation Plan will go into effect.

        - If the measures are implemented but do not achieve the desired effect, the State implements pre-adopted contingency measures.

Discussion by the Subcommittee

Following is a summary of selected comments made by Subcommittee members at the October 1997 meeting.

States and Tribes

- States are supportive of anything to enhance voluntary efforts. They are interested in the concept of pre-adopted national contingency measures. The five sets of controls required in 2005 and beyond will be a real challenge.

- Voluntary measures and less certain measures should remain in the category of contingency measures.

- Solid measures should be put in the core plan and not saved for contingencies. The contingency measures that will be left are voluntary and episodic. Contingency measures should meet goals similar to those EPA has set in the past.

- When EPA does not come through with reductions, the responsibility falls back on the States.

- An example of a voluntary measure is RVP gasoline and it is measurable.

Industry

- This approach presumes that the national contingency measure will be available before a State or local area developed its SIP.

- Voluntary measures can be meaningful, enforceable, and quantifiable. They should be up front in a core measure but also in contingency measures, in some cases. There should be a legal basis behind the recommendations the Subcommittee makes.

- Adopting national contingency measures can be a waste of resources for EPA; resources will be better spent on core measures.

- Voluntary measures can be considered the contingency measures of last resort after considering those that are certain, enforceable, and quantifiable.

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Environmental/Public Interest Group

- There is concern about the uncertainty associated with some contingency measures. They must be enforceable. Will the Act allow voluntary measures to be used as contingency measures? Voluntary measures need time to be proven; they can be ripe for abuse.
- Voluntary measures might be more appropriate in the core measures and can be addressed in the control strategies.
- Voluntary measures should be valid control measures if there are statistics to back them up. Voluntary measures should be quantified and then used as contingency measures. They could work better in the core measures where there is time to try them.
- A caveat needs to be added to the issue of substitution. Before substitution of measures, it should be shown that the old measure should not be retained as well.
- The transitional areas recommendation should be considered as information only, not as a formal recommendation.
- National contingency measures are significant issues and more options need to be developed.

Federal Agencies

- The Federal Government should be accountable if anticipated reductions specified in SIPs are not achieved.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.24 Rewards and Sanctions

Discussed at February 1997 meeting.

Issue #1 How can States and Tribes be encouraged to plan and implement early?

Issue #2 How can States and Tribes be discouraged from missing deadlines?

Issue #3 How can sources be encouraged to reduce emissions early?

Background

This paper discusses rewards for accelerated air quality planning and implementation and sanctions for delays and missed deadlines. Both encourage early emission reductions and accelerated planning and implementation under the new NAAQS and Regional Haze Rule. The incentives encourage States and Tribes to submit and implement SIPs and TIPs early, and prompt sources to voluntarily reduce emissions in AOIs and areas at risk. An additional goal is to encourage early actions to support the integration of ozone, PM-2.5, and regional haze time lines.

The general principles used by the work group in developing this paper are:

- No proposal should make any situation worse.
- Positive incentives should encourage early compliance.
- Negative incentives should be applicable immediately and should "fit the crime."
- No backsliding can be allowed.

Rewards for reducing emissions may take many forms. For emission sources, they may include public recognition (awards from Government or favorable media coverage), financial rewards (reductions in corporate income taxes and low- or no-interest loans), accelerated permit processing, and reduced State oversight. Rewards for States and Tribes may include improved air quality, flexibility to tailor strategies to local conditions, avoidance of nonattainment area designation or redesignation, and reduction in future administrative burdens.

For sanctions to work, especially for minor infractions, they must be realistic. The

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current sanctions are like nuclear weapons; one really does not want to use them unless necessary.

Options Presented by the NRSWG

The following options were presented as possible solutions to the above issues.

1. Several incentives or "rewards" are seen as possibilities in encouraging States toward early compliance with planning requirements. A reduced offset ratio could be granted to those areas which require offsets, making it easier to attract new industry. As an alternative, additional offset credits could be granted, although a pool of offset credits would have to be established. Increased flexibility could be granted to States, either through a variation on the Flexible Attainment Region (FAR) concept, whereby States are granted extra time to deal with future violations in a flexible manner, or through "trading" certain mandatory measures (such as NO_x RACT, NSR, or transportation conformity) for other equivalent measures. A set-aside of Federal highway money could be structured to accelerate planning.

2. As noted above, negative incentives are intended to be applied immediately upon a missed deadline and should be seen as appropriate punishment for the "crime," but not so onerous as to cause a political response. Examples of negative incentives include: accelerated future deadlines, additional requirements such as lower RACT thresholds, denial of variances or alternative emission limits, discounted credits, or reduction requirements imposed on the agencies of the State.

3. *Safe harbors.* Increased flexibility could be granted to sources, either individually or collectively, in the form of safe harbors. The advantages of safe harbors include early emission reductions and, for regulators, more certainty and less hassle. The disadvantages include limitation on regulators' control options in the future. Regulators may qualify safe harbor programs with either a limit on the number of years during which they are available or explicit provision for imposition of controls on the sheltered sources. EPA cannot give certainty to safe harbors, reducing the certainty for sources.

The work group is considering three safe harbors for highway vehicles:

1. Flexibility in new vehicle certification allowing vehicle manufacturers to average emission limits over several models, i.e., lower emissions on models that can meet limits with less cost are averaged with higher emissions on models that are more costly to control.

2. Exempt post-1996 models with on board diagnostics from inspection and maintenance programs.

3. Clean fuel fleet rebuild every 100,000 miles.

Discussion by the Subcommittee

Following is a summary of selected comments of the Subcommittee discussion on the issue paper presented at the February 1997 meeting.

States and Tribes

- There needs to be a process to prevent States from missing deadlines. The response is that the work group is primarily concerned with getting the process started not specifically with meeting attainment.

- Is the work group addressing missed attainment deadlines? The response is that there is some ambivalence among the States about the whole concept. The public sector operates in good faith, takes these deadlines seriously, and rarely fails to meet them. However, occasionally

deadlines are missed and mistakes made based on administrative errors or shortfalls in technology. EPA's current guidance calls for the sanction clock to start immediately upon the infraction. Regarding alternative control techniques guidance, EPA produced only three of the 13 promised documents; however, States are still required to produce their regulations on time. Thus, there is a need for EPA to perform and be held accountable in some other way than being drug into court.

- Voluntary measures can play a role in the process. There are measures that can be implemented outside of command-and-control procedures. Mass transit subsidies are a good example of this type of approach. In the initial years, some type of contingency measures will be needed in case the anticipated reductions are not met.

Industry

- There is concern that the early reductions end up functioning as a silver bullet, ideas that are not well thought out and result in industry spending a good deal of capital with little or no benefit. The paper should incorporate something about planning and analysis of the reductions prior to making recommendations.

- In contrast to Section 112 and the HAPs program, EPA's Project XL is more pragmatic and shows a great deal of promise for providing early reduction incentives.

- The early reduction program can be summarized by the industries that are currently participating. It must be less prescriptive and more realistic. Previously, the programs were more onerous than those provided for under command and control and in some cases were more costly than the emissions control devices themselves. The Consolidated Air Rule will streamline reporting requirements making them more easily implemented by industry.

- Industry has incentive to over control in anticipation of source growth and should be allowed to take advantage of this under the safe harbors provision. Industry must have some incentive to do more and to do it early. The Title IV early NO_x election is an excellent example of a safe harbor. One consideration is the placement of a hurdle that can be met in a specified timeframe; the hurdle and time line should be attainable. Another is that the sanctions must be focused on those that are causing the problems. Overall, early reductions are good, but the disincentives must be removed.

- The private sector, the State, and EPA have to be linked to ensure that the system will work, as opposed to the historical measure of failure. It would be useful to look at States that have complied and those that have not. The work group could reveal problems within the current system and demonstrate the benefits the new programs offer.

Environmental/Public Interest Groups

- Although missing deadlines and delays was mentioned as part of the scope of the paper, there is a question as to whether the work group is interested in the problem of sources missing attainment deadlines. Several meetings ago there was a work group discussion dealing with missing attainment dates, but missing attainment dates do not appear in this paper at all. The issue needs to be discussed.

- The best incentive for early reductions is to stop allowing emissions to be released without penalty. Early reduction incentives and the concept of emission fees have been addressed. They could be designed to be revenue neutral, where the good performers get money back and the poorer performers do not.

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- There is no discussion in the paper on what it takes to motivate the States to move. The paper would benefit from addressing State motivation.

- There are questions about whether emissions will be reduced from the baseline, or from some baseline offset ratio to accomplish some meaningful reduction, and whether EPA will consider offset ratios of 1.2 to 1.3. The safe harbor concept, combined with all the uncertainties, means that the attainment date considerations all go out the window.

- It may be useful to explain in the paper that safe harbors and early reductions do not really apply to areas that are in nonattainment and will remain in nonattainment. A question was asked about How will early reductions work in an integrated program.? The equities need to be addressed for the integrated program concept. Under its principles, the work group talks about making things no worse, doing no harm. One of the principles must be to reward significant reductions, not just run-of-the-mill reductions.

- In response to a request for a definition of significant reductions, the work group should look at the best sources in the group to determine this level, perhaps BACT or LAER. A combination of a baseline date and a benchmark could be used as a means of determining when a source achieves early reduction credits.

- In response to a request for a definition of "worse" as it is used in the general principles, it can be defined in terms of raising costs. Sanctions should not be used that raise inefficiency or costs. This goes back to the earlier point about trying to make the sanctions meet the crime. If the problem is at the State level, then the hammer should be at the State level and not at the source level. Trading programs can provide the proper incentives for sources.

- Addressing the issue of punishing the guilty, it is important that a dynamic exists between emitters and regulators. When emitters operate in a cost-free environment, they will take great advantage of it. It does not seem productive to punish States in this type of system. The group whose behavior is providing a disbenefit to the process should be punished. There is an incentive for delay from emitters, and the challenge is to find an incentive/disincentive approach.

- A requirement for SIP revisions or control strategies should be included in the paper. An increased rate of progress could also be required in the SIP revision, above and beyond the RFP milestone. A range of sanctions is a good idea, but they should not be expanded too far. Sanctions should be a supplement, not a substitute. Sanctions should be consistently applied. EPA almost never uses them, and, when they do, they are used in an inconsistent way which undermines EPA credibility. An early reduction plan submission should not receive any reward. The State should have to wait for its reward until the plan is implemented and the reductions are actually realized.

- In response to a question about how replacing of inspection and maintenance (I/M) programs is a benefit, there are incentives to the States because I/M programs are not popular with the general public. If onboard diagnostic systems allow one to avoid I/M programs, there is a benefit. There is also an incentive to manufacturers to improve their vehicles.

- Skepticism exists over the public's willingness to purchase vehicles equipped with onboard diagnostic systems. The response was that the work group is not proposing to eliminate I/M programs. It is simply proposing to exempt vehicles with onboard diagnostics.

- Under the current system, it makes sense to wait since the deals get better later in the planning cycle. The first plans reviewed are done totally by the book, so waiting is a good thing. This disincentive to early plan submittal needs to be removed.

- The work group should look at examining incentives and sanctions for Federal facilities and Federal agencies. The States struggle with Federal partners in this process.

- Incentives that are directed at the public and may be accepted by the general public willingly (e.g., the I/M and new car exchange programs) need to be examined.

Federal Agencies

- Early plan submittal and early reductions are a good idea. Some of the larger major metropolitan areas have done just about all they can do toward reaching attainment for ozone, and they still cannot show attainment. The work group needs to recognize that if something is done on time, it may not always work. The only recourse is to implement major life-changing activities. Some credit should be given for implementation of these big programs. EPA has an obligation to come through with guidance, tools, and national regulations where needed.

- Regarding set-aside money as a potential incentive, set-aside money has always been very controversial, especially with Federal highway funds. Existing legislation has a set-aside program in place that puts half of the money toward mass transit, some to high occupancy vehicles, and the rest to I/M programs. Other funding sources can be linked to transit as well.

- Mandating controls like car pools has been unsuccessful since the 1970s; they are not politically acceptable. The work group should take a long look at these mandates.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

B.25 Measures Affecting Cars, Trucks, Buses, And Other Vehicles

Presented at April 1997 meeting.

[Official title: *General Mobile Source Measures*]

At the Subcommittee's April 1997 meeting, representatives of EPA's OMS made several presentations on mobile source issues. Subsequently, an issue paper on mobile source measures was drafted but not presented to the full Subcommittee. The paper ultimately was withdrawn from consideration. The issues and background presented below are derived from the July 1997 draft issue paper. The summary of the Subcommittee discussions is drawn from comments of Subcommittee members following the April presentation by OMS.

Issue #1	Will the concepts of AOV/AOI change the areas in which I/M programs are helpful in meeting air quality goals?
Issue #2	What is the appropriate approach to I/M on pre-onboard diagnostics-equipped vehicles?
Issue #3	If I/M is no longer required but thought to be beneficial in terms of air quality benefits, what kind of incentives can EPA construct to ensure that dirty cars are repaired once they have been identified?
Issue #4	Are onboard diagnostics a replacement for I/M on the newer fleet, and if so, how should areas ensure that emission failures are repaired?
Issue #5	Should medium- and heavy-duty I/M be included?

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Issue #6	Should the Federal 7.8 psi standard apply to new "southern" nonattainment areas? Should States have flexibility to adopt a 7.8 psi State Reid vapor pressure (RVP) standard for AOIs?
Issue #7	Should the status quo regarding mandatory reformulated gasoline (RFG) areas be maintained under a revised ozone NAAQS?
Issue #8	Should additional areas be required to use RFG as a control measure? If so, what mechanisms will be available?
Issue #9	If portions of the current mandatory RFG areas are designated as attainment under the new NAAQS, should such areas be able to opt out of the RFG program?
Issue #10	Should new nonattainment areas have the opportunity to use Federal RFG as an ozone control measure? How should this opportunity be made available?
Issue #11	Will attainment areas generally have an adequate opportunity to use RFG as an ozone control measure under a revised NAAQS?
Issue #12	Should attainment areas not previously classified as marginal or worse for ozone have an opportunity to use RFG as an ozone control measure?
Issue #13	Is a similar approach to the current requirement for reclassified areas desirable under a revised NAAQS for areas where the air quality degrades to a specified level?

Background

The potential revisions to the NAAQS for ozone and PM will have significant impacts on the implementation of mobile source measures and the need for further emission reductions. Although advances have been made in reducing emissions through emission control technology, trucks and cars still account for a major portion of ozone pollution and nearly all of the carbon monoxide pollution in the United States. In-use emissions, which are those that are actually occurring when the engines and vehicles are used by consumers, have been a significant contribution to emission inventories in the past. The 1990 CAAA and the 1991 Intermodal Surface Transportation and Efficiency Act require air quality and transportation planning to be coordinated by each State.

The CAAA introduced a comprehensive set of programs aimed at reducing pollution from vehicles. These included the following program areas:

- lower tailpipe standards,
- more representative emission testing procedures,
- expanded I/M programs,
- new vehicle technologies and clean fuels programs,
- transportation management provisions, and
- regulation of emissions from nonroad vehicles.

The CAAA requires areas in violation of the NAAQS to be classified depending on air pollution levels, with a more stringent pollution control program required in areas with a higher classification. The classifications--marginal, moderate, serious, severe, and extreme--dictate the type of inspection and maintenance program to be implemented. The CAAA requires States with areas designated as severe nonattainment for ozone to offset any growth in highway vehicle emissions resulting from growth in either vehicle miles traveled or trips. Such increases must be equally offset with specific transportation

control measures (TCMs). These measures are to include, but are not to be limited to, improved public transit, flexible work schedules, allowances for special traffic lanes for high-occupancy vehicles, programs to encourage bicycling and walking to work, and more controls on emissions and vehicles idling.

EPA intends to consider the following new measures for engines as national measures supporting attainment of the current or any revised NAAQS:

- Tier II light-duty vehicle standards, including PM,
- heavy-duty vehicle retrofits and/or voluntary standards,
- heavy-duty in-use initiative,
- long-term heavy-duty emission standard research,
- new truck and bus PM standards;
- nonroad diesel PM test procedure and standards, and
- research into further reductions from locomotives, aircraft, ships, lawn mowers, and other small equipment.

Most States pursue I/M programs to help achieve the emissions reductions required. Current requirements for I/M are based on an area's nonattainment status for carbon monoxide and/or ozone, the severity of the pollution problem, and the area's population. By changing the existing NAAQS and the methods for classifying attainment status, areas subject to I/M are likely to change considerably in terms of applicable geographic area and program requirements. As a result, the basis for mandatory I/M requirements associated with the current classification scheme will also change. Changes in the technology of the vehicle fleet and new information about I/M program design suggest a strong need to evaluate the type of in-use emission inspection program most appropriate in the time frame of the new NAAQS.

The possibility exists that the new NAAQS will reclassify more States as nonattainment at the same time the new revised mobile model will be finalized to show I/M to be somewhat less effective as a control strategy than predicted.

The introduction of unleaded gasoline in the 1970's and the subsequent reduction of the lead content in gasoline resulted in fuel that is more volatile. This increases evaporative emissions of hydrocarbons, which contribute to ground level ozone formation. The average RVP of summer gasoline increased from 9.8 psi to 10.4 psi. The CAA section 211 (h) establishes requirements for gasoline to have a RVP 9.0 psi or less during the high ozone season. EPA has the authority to set a lower RVP requirement in nonattainment areas as necessary. "Southern" ozone nonattainment areas are required to sell gasoline with a vapor pressure of no greater than 7.8 psi during control periods.

The CAAA also contained provisions for transportation fuels. Gasoline and diesel fuels are both produced from crude oil. Together, gasoline and diesel fuel power 99 percent of this country's motor vehicle fleet. The CAAA explicitly recognizes that changes in fuels as well as in vehicle technology must play a role in reducing air pollution from vehicles. The CAAA regulates the sulfur content in on-highway diesel fuel to help reduce sulfur dioxide and particulate emissions.

The Act also includes several programs that will require cleaner fuels and open the market to nonpetroleum gasoline additives. There are six major fuel-related provisions of the CAAA, including oxygenated fuels, reformulated gasoline, reduced sulfur content in diesel fuel, California Pilot Program, Clean-Fuel Vehicle Program, and transit bus provisions.

Under the proposed 8-hour standard, an additional 229 counties are likely not to meet the ozone standard. These new nonattainment areas will likely need to implement air quality control measures, increasing the States' interest in RFG as a cost-effective option. If the proposed ozone standard is adopted, the classification

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system set forth in Title I, Subpart 2 of Part D would not apply. It would be effectively obsolete since it is tied to the 1-hour standard.

A number of impacts on RFG are possible. Depending on the boundary of AOVs and AOIs, portions of the mandatory RFG areas could be designated attainment. New nonattainment areas designated under the proposed 8-hour standard may not be able to opt into the RFG program as an ozone control measure. Some areas that have always been in attainment may become AOIs and would need to adopt ozone control measures. For former nonattainment areas, EPA expects to propose regulations to clarify classifications.

Discussion by the Subcommittee

Following is a selected summary of Subcommittee discussions about the presentations at the April 1997 meeting.

States and Tribes

- EPA is encouraged to develop policies for intermittent types of control measures, like ozone action days, for all pollutants.
- The OMS program is not unlike the stationary source strategies that EPA uses. As older facilities are shut down, new sources become existing sources, and eventually become old and go offline. It is important to maximize the emissions reductions from any of the new categories. Lost emissions reductions opportunities have to be made up in another sector.
- There are concerns about the process with regard to stakeholder involvement. More involvement should be encouraged.
- EPA should look at some of the successful State programs currently operating to reduce mobile source emissions.
- Fuel choice probably has the most effect on ozone of any control measure. The Subcommittee should look at the successes of fuel programs.
- EPA should be careful that the modifications of gasoline do not add things to the environment that will affect the public adversely. Does EPA have medical people evaluate potential effects? The answer is no, but EPA has risk and health effects people.
- Proceeding with conformity will lead to great complexity in transportation planning. There should be a way to bridge the gap using the track record of stationary sources.
- EPA should work on education programs, especially in dealing with airport issues.
- States should have access to new EPA tools, such as the MOBILE model, as soon as possible.

Industry

- There need to be incentives for fuel oxygenation.
- Low-sulfur fuel currently applies only to on-road vehicles; EPA might look at expanding this program to off-road vehicles.
- EPA should fund behavioral research as a means of reducing emissions, especially in light of the growth in vehicle miles traveled.

Environmental/Public Interest Groups

- There are concerns about the gains and possible tradeoffs of any reductions in toxic and greenhouse gases and whether these considerations are being included in EPA analyses.

- There is a question about why reductions for locomotives and aircraft are expressed for NOx while for buses they are presented for particulate matter. The answer is that the urban bus retrofit program is focused on PM; for other engines the strategies are NOx based.

- National aggregate figures reflect the inventories currently available for certain communities, and these vary substantially across the country. They are of extremely little value in constructing national control strategies.

- EPA is strongly encouraged to accelerate the diesel portions of its emissions control programs.

- EPA is encouraged to not wait until 2000 to evaluate whether conformity is working.

- EPA should develop a model that more accurately captures urban sprawl in new road projects and make models more sensitive to the growth-inducing effects of transportation projects.

Federal Agencies

- There are tradeoffs to be addressed in the control strategies matrix that go beyond mobile sources.

- EPA can see a variety of control strategies available to provide SIP credits. It would be useful to develop a matrix that summarizes all of the options. EPA would like to explore incentives for early buy-ins to some of these programs.

- EPA needs to be careful with new fuel effects. Changes in fuels are effective ways to reduce emissions as opposed to transportation control measures.

- EPA needs to look at control strategies that are outside of the Federal mandate.

- EPA is redoing the MOBILE model to account for conformity and other issues and look at pros and cons. MOBILE should be updated by summer 1998.

A summary of overall Subcommittee recommendations on this issue is presented in Chapter 3.

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APPENDIX

C

Primary Audiences and Information Needs

APPENDIX C

PRIMARY AUDIENCES AND INFORMATION NEEDS

How will I be affected? Implementation Issues

Information Need	Primary Audience	Where Information Is Addressed[1]
What does integrated implementation mean?	State/local	Integrated Implementation issue paper one-pager
What will the standards be and when will we know?	State/local, affected industries	Ozone/PM NAAQS promulgation: 7/97
Will EPA develop national emission standards to support State control efforts?	State/local	
How will PM and regional haze be measured?	State/local	Regional Haze issue paper one-pager
What will the implementation period be?	State/local	Attainment Dates issue paper one-pager
What Federal money will be available for monitoring plan development, and implementation?	State/local	Monitoring Incentives issue paper one-pager
Given the current proposed EPA timeline, will we be able to adequately characterize our attainment/ nonattainment status through monitoring before EPA designates our areas?	State/local	AOI/AOV issue paper, Monitoring Incentives issue paper one-pagers
How will the boundaries of nonattainment areas be determined, and how will transport problems be addressed?	State/local	AOI/AOV issue paper one-pager
How will the revised standards affect existing SIPs?	State/local	Interim Implementation Policy one-pager
How is EPA going to factor in "natural events" and "exceptional events" and explain these policies to the public in a way that makes sense?	State/local	
Are there any cross-over benefits to controlling ozone, PM, and regional haze? If so, what are those benefits? What other pollutants may play a role?	State/local	Integrated Implementation issue paper one-pager, regulatory impact analysis fact sheets, Ozone/PM fact sheets
What sources contribute to ozone, PM, and regional haze?	State/local Airline Pilots Assoc.	Ozone and PM staff paper fact sheets, Ozone/PM health effects fact sheets
What measures can be implemented to control these sources?	State/local Airline Pilots Assoc.	Phase II FACA issue — materials to be developed
Is my business affected? Are there circumstances whereby my business could be exempted (e.g., size of the operation)?	Affected Industries	Maps (with NAAQS Proposal)
What must I do to either comply with the new standards or have my business designated as exempt?	Affected Industries	Economic Incentives issue paper, New Source Review issue paper one-pagers
Timing issues: When do I have to comply?	Affected Industries	Areas at Risk issue paper, Economic Incentives issue paper, Attainment Dates issue paper, New Source Review issue paper one-pagers, time lines may also be developed
Compliance options that would be acceptable to EPA.	Affected Industries	
Interrelationship among the three programs — how does one pollutant affect the other?	Affected Industries	Integrated Implementation issue paper one-pager

[1] *Issue papers and related fact sheets will be made available on the TTN and the website.*

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How will I be affected? Implementation Issues

Information Need	Primary Audience	Where Information Is Addressed[1]
What can the average citizen do to control ozone, PM, and regional haze?	State/local, interested public	
What Federal control programs can we expect? When?	State/local	
What are the costs of control?	State/local	
What are the costs of implementation?	State/local	
Where will the money come from?	State/local	
What are the costs of not controlling?	State/local, environmental/public interest, interested public	Ozone/PM RIA fact sheets
How will the FACA process coordinate with other ongoing efforts, including OTAG and the GCVTC?	State/local, environmental/ public interest	
Is my area in compliance with the standards?	Interested public	Maps (with NAAQS proposal and promulgation)
Why is EPA reviewing the standards? On what basis are they set?	Interested public	NAAQS Review fact sheet
How is EPA addressing implementation?	Interested Public	FACA fact sheet

Why are we doing this? What is the basis for the rule?

Information Need	Primary Audience	Where Information Is Addressed[1]
What is ozone? What is PM? What is regional haze?	Interested public	Ozone Health/Environmental Effects fact sheet
Why should I be concerned?	Interested public	Health/Environmental Effects fact sheets
What are the health and environmental effects of ozone, PM, regional haze?	State/local, environmental/public interest, interested public	Ozone, PM staff papers, Criteria Documents, Health and Environmental Effects fact sheets
How can we explain, in layman's terms, why multiple exceedances are allowed if the standard is set to protect health?	State/local	Ozone and PM NAAQS Proposal Preamble (possible fact sheet also)
How much of a safety margin will be built into the standards? Can we anticipate health effects below the standard, and if so, how do we explain how the standard was determined?	State/local	Ozone and PM staff papers, Criteria Documents, NAAQS Proposal Preamble
Concise information in plain English regarding the health and environmental need for revised standards.	Environmental/ public interest	Ozone and PM Health/Environmental Effects fact sheets
Concise information in plain English about the regional nature of the fine PM/ozone/regional haze problem, and the role of the FACA Subcommittee in developing control strategy recommendations.	Environmental/ public interest	Ozone and PM Health/Environmental Effects fact sheets

[1] *Issue papers and related fact sheets will be made available on the TTN and the website.*

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Why are we doing this? What is the basis for the rule?		
Information Need	**Primary Audience**	**Where Information Is Addressed[1]**
Access to this information via the Internet, preferably the World Wide Web. It was recommended that EPA establish a web page specifically for the subcommittee process.	Environmental/ public interest	Ozone/PM/Regional Haze FACA Website — July 1996
Graphics on PM-10/2.5 and ozone source emissions and trends.	Environmental/ public interest	
Recommendation that EPA issue a press release on the Subcommittee process and the regionality of the ozone/PM air pollution problem (observation that EPA press releases get better coverage than those of environmental/public interest groups).	Environmental /public interest	
A single contact at EPA for environmental/public interest groups on the PM/ozone/regional haze implementation issue.	State/local agencies Environmental/ public interest	

[1] *Issue papers and related fact sheets will be made available on the TTN and the website.*

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