Southeastern Pennsylvania Ozone Stakeholder Working Group

Final Report

January 16, 1997

Convener: Commonwealth of Pennsylvania

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Southeastern Pennsylvania Ozone Stakeholder Final Report

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Related environmental information is available electronically via Internet. Access the DEP-DCNR Web Site at http://www.dep.state.pa.us (choose Information by Environmental Subject/choose Air Management.

March 12, 1996

See Attached List

Dear _____:

We are pleased to invite you to participate in the Southeast Pennsylvania Clean Air Stakeholders Group. The Stakeholders Group will work during the next year to develop a course of action for the attainment and maintenance of the health-based ozone standard, a strategy tailored to meet the regional needs of the Philadelphia area.

We believe that new clean air strategies in areas with continuing air pollution problems should be developed from the ground up, by those with significant stakes in the outcome. The Commonwealth needs a plan that is based on good air pollution science, is equitable among air pollution sources and meets the requirements of the federal Clean Air Act Amendments. The Clean Air Stakeholders Group has been charged with this important mission. We expect the outcome of this effort to be recommendations that the Commonwealth can use as the basis for continuing to meet its clean air obligations. The group will operate by a consensus decision-making process. Areas on which there is no consensus will also be identified.

Since the sources contributing to ozone pollution and the people affected by it are diverse, the stakeholders group has to be large enough to represent these interests, yet small enough to form a group that can work together. You have been selected because of your ability to provide appropriate representation, as well as your personal qualifications and capacity to work toward consensus on a broad range of clean air issues.

The first meeting has been scheduled for April 1 and 2, 1996. Most of the time at this convening meeting will be spent on developing principles of operation for the group, identifying agenda items, and participating in a brief training session on interest-based negotiation and consensus building. The group will also develop its own meeting schedules. You will be getting a packet of materials for the first meeting in the next few days. The Commonwealth will reimburse you for your travel expenses through a procedure which will be explained at the first meeting. As you already know, the Commonwealth has engaged an independent facilitator from CDR Associates to help us achieve a common understanding of the problem and arrive at potential solutions.

Consensus is not an easy process. It takes communication, compromise, common sense and most of all, commitment. We appreciate your willingness to work with us, and we look forward to working with you in the coming months. Should you have questions in the meantime, please feel free to contact Robert Barkanic, Special Assistant; Air, Recycling and Radiation Protection, DEP, at 717-772-2725.

Sincerely,

James M. Seif
Secretary
Department of Environmental Protection

Sincerely,

Bradley L. Mallory
Secretary
Department of Transportation

January 16, 1997

The Honorable James M. Seif
Secretary
Department of Environmental Protection
P.O. Box 2063
Harrisburg, PA 17105

The Honorable Bradley L. Mallory
Secretary
Department of Transportation
555 Walnut Street
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Gentlemen,

The Southeastern Pennsylvania Ozone Stakeholders submit the enclosed report for your consideration. This report provides the results of our deliberations, including recommended control measures, supporting assumptions and context. In addition, we have indicated non-consensus items which we feel will require additional attention from the Commonwealth.

In accordance with the stakeholders' adopted mission statement and charge, the recommendations are based on the current health-based hourly ozone standard of .12 ppm to be achieved by the year 2005.

We look forward to your comments and your full support for our recommendations. Our deliberations were thorough and diligent; the outcome merits serious consideration. Collectively, the stakeholders stand ready to meet with you to discuss these proposals.

Sincerely yours,

Southeastern Pennsylvania Ozone Stakeholders

Ronald J. Ruggerbach
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Chester County Health Department

Automotive Service Association of Pennsylvania

Kleman Motors

City of Philadelphia

ASE SAE

Sea Change

Sun Company/Associated Petroleum Industries of Pennsylvania

U. S. Environmental Protection Agency

AAA Mid-Atlantic

Clean Air Council

DEP Citizens Advisory Council

Rohm and Haas

Pennsylvania Department of Transportation

Delaware County Transportation Management Association

Montgomery County Planning Commission

INTRODUCTION

Stakeholders Mission

The Governor of Pennsylvania, through the Pennsylvania Department of Environmental Protection and the Pennsylvania Department of Transportation, created the Southeastern Pennsylvania Ozone Stakeholders to recommend control strategies to the Commonwealth for attainment and maintenance of the current health-based standards and the requirements of the 1990 Federal Clean Air Act Amendments. Under the Clean Air Act Amendments, the five counties in southeastern Pennsylvania—Bucks, Chester, Delaware, Montgomery and Philadelphia—are currently classified as "severe non-attainment" for ground-level ozone. The non-attainment area also includes parts of New Jersey, Maryland and Delaware.

Ground-level ozone is a colorless, odorless gas produced when nitrogen oxides (NOx) and volatile organic compounds (VOC) react in the presence of heat and sunlight.

In accordance with the stakeholders' adopted mission statement and charge, the recommendations in this report are based on the current health-based standard of .12 ppm of ozone to be achieved by the year 2005.

The stakeholders attempted to balance emission reductions equitably among different source types—area, mobile and stationary. It is important to preserve this balance as the recommendations are implemented.

Stakeholders Process

The stakeholder effort was a public process, held in open meetings, representing a broad base of constituencies. In addition, the stakeholders made an effort to ensure that other groups and the general public were aware of the process and had an opportunity to provide us with input. The stakeholders held one public input meeting on November 7, 1996. The recommendations contained in this report are the result of long hours of deliberation and struggle. The stakeholders met for two full days each month, from April through December to discuss and, whenever possible, to find agreement on strategies that can materially improve air quality in southeastern Pennsylvania.

At the same time that the stakeholders began to deliberate, the Inspection and Maintenance (I/M) Working Group began to design the Commonwealth's decentralized inspection and maintenance program. The stakeholders worked to avoid issues associated with implementation of the inspection and maintenance program, leaving those issues to the I/M Working Group.

Stakeholders Members

The Southeastern Pennsylvania Ozone Stakeholders represent a wide range of interests from environmental and citizen groups, industry, public utilities, small business, transportation, government, and motorist and health-care organizations. Twenty-eight stakeholders were invited to participate in the stakeholders process. During the process, some invitees withdrew, and others were added by the group to maintain the group's balance.

CONSENSUS AGREEMENTS

The recommended strategies outlined in this report are based on a consensus decision-making process as outlined in the Stakeholders' Operating Agreement (See Appendix D). Consensus is an agreement built by identifying and exploring all parties' interests and drafting a recommendation that satisfies these interests to the greatest extent possible. The recommended control measures throughout this report are labeled as consensus recommendations only if all the stakeholders agree that their major interests have been taken into consideration and addressed in a satisfactory manner. This report also contains items without consensus agreements. In those cases, the control measure is described along with differing points of view.

STAKEHOLDERS EVALUATION PROCESS

The deliberations of the Southeastern Pennsylvania Ozone Stakeholders have followed two guiding principles and objectives: 1) to identify control strategies that collectively produce regional air quality that meets the current health based standard, and 2) to reflect the unique conditions of southeastern Pennsylvania. In so doing, the recommendations contained in this report seek to balance federal requirements for air quality with cost effective strategies that protect the public health and the regional economic integrity of the five county non-attainment area.

EMISSIONS ASSESSMENT

Modeling

The stakeholders reviewed Urban Airshed Modeling results as a way to test transport and boundary assumptions, examine the impact of control strategies already adopted or proposed for implementation and lay the groundwork for southeastern Pennsylvania's subsequent attainment demonstration.

The transport (movement) of ozone and its precursors, VOC and NOx, into and out of the five-county area was discussed many times during stakeholder deliberations,

including during modeling work. The impact of transport on attainment appears to be significant, particularly for NOx. The stakeholders make their recommendations in anticipation that other regions, particularly up-wind areas, will implement similar levels of control to positively impact southeastern Pennsylvania's air quality. The stakeholders recognize that the five-county area will not demonstrate attainment until downwind areas are also able to demonstrate attainment.

Stakeholders' Emissions Targets

In southeastern Pennsylvania there are a variety of different sources of both NOx and VOC. Point sources include large industries and utilities. Area sources are small emission sources. Mobile sources, both highway and off-road vehicles, are the third category of ozone forming emissions. The 1990 estimates of pollutant by source (excluding biogenic or natural emissions) are depicted below.

Pennsylvania Portion of Philadelphia Non-Attainment Area
Anthropogenic VOC Emissions by Source

Estimated Total Emissions: 612 tons per summer day
Point 24.5% Area 30.4% Mobile 45.1% (Highway 30.7%, Off-Road 14.4%)

Pennsylvania Portion of Philadelphia Non-Attainment Area
Anthropogenic NOx Emissions by Source

Estimated Total Emissions: 451 tons per summer day
Point 37.7% Area 5.1% Mobile 57.2% (Highway 35.1%, Off-Road 22.1%)

Source: Pennsylvania Department of Environmental Protection

The stakeholders spent a great deal of their time reviewing emission inventories, emission projections and other baseline information. In one such presentation, Dr. S.T. Rao from the New York State Department of Environmental Conservation, suggested that a 25% reduction in VOC and a 50% reduction in NOx from the 1990 baseline across the entire eastern United States could lead to attainment. The group agreed to use the information from Dr. Rao as the best available overriding strategy to set emission reduction targets. Because NOx and VOC emissions are not evenly distributed throughout the region, the stakeholders understand that these reduction goals must be viewed as regional in nature. Thus, they will not be achieved in Southeastern Pennsylvania alone, but over a multi-state area. The development of Pennsylvania's attainment demonstration will be coordinated with Pennsylvania's neighboring states and the Ozone Transport Commission.

Reductions from adopted and proposed control measures are projected to result in a 35% reduction of VOC emissions by the year 2005. The stakeholders recommend VOC control strategies beyond the 35% reduction from 1990 baseline. Thus, the 25%

VOC reduction target (approximately 150 tons per day) will be exceeded by as much as 100 tons .

Reductions from adopted and proposed control measures are projected to result in a 27% reduction in NOx emissions by the year 2005. The group looked for additional NOx reductions beyond the 27%. To reach 50% reduction from 1990 baseline, the stakeholders would have to identify measures that reduce approximately 105 tons of NOx per typical summer day. However, the NOx reductions were more difficult to achieve, and the stakeholders identified measures that reduced approximately 50 of the 105 tons.

Voluntary measures recommended by the stakeholders in this report could yield approximately 8 additional tons of VOC and approximately 10 additional tons of NOx.

The stakeholders recognize that the interplay between the two pollutants is uncertain. The additional reduction in VOC emissions will result in benefits to local air quality as well as benefits to the more regional ozone problem.

The following table lists the recommended strategies and an estimated NOx or VOC reduction. In some cases no estimated emission reduction is listed. Those cases include:

- recommended strategies that require research to quantify (e.g. heavy-duty diesel inspection)
- recommended strategies with unresolved implementation issues (e.g. change in fuels beyond the five-county area), or
- strategies with uncertain agency commitment (e.g. 200 additional CNG buses).

Southeast Pennsylvania Ozone Stakeholders
Control Measures and Emission Reduction Estimates

Description	VOC (tpd) Reduction	VOC (tpd) Total	NOx (tpd) Reduction	NOx (tpd) Total
2005 CAA Baseline Emission Estimate		397		331
Auto and Truck Body VOC Content Limits	3.8		0	
Auto and Truck Body Refinishing	1.0		0	
Degreasing	5.9		0	
Gasoline Service Stations: Stage II Vapor Recovery Systems	1.9		0	
Lawn Care	11.2		0.7	
Additional Remote Sensing	1.2		0.6	
Heavy-Duty Diesel NOx Research				
National Low Emission Vehicle	11.5		13.5	
Alternative Fuels Programs	2.4		1.4	
Airport Emission Controls	0.2		0.07	
Fuel Changes Beyond 5-County Area				
Southeast Pennsylvania Transportation Authority				
Clean Diesel Program	0.5		2.2	
Park and Ride Lot Expansion	0.03		0.04	
Rail Headway Improvements	0.04		0.06	
Improvements to Suburban Bus Service				
CNG Buses				
Utility Boilers: Phase III of NOx MOU	0		6.4	
Industrial Boilers	0		3.5 to 4.5	
Process Heaters	0		6.8 to 8.6	
Reciprocating IC Engines	0		11.0	
Subtotal	39.7		46.3 to 49.1	

Southeast Pennsylvania Ozone Stakeholders Voluntary Measures

Description	VOC (tpd) Reduction	NO. (tpd) Reduction
Mobility Alternatives	0.08-1.76	0.1-1.94
Comprehensive Regional Ride Sharing		
Transit Chek		
Telecommuting		
Alternative Work Schedules		
Educational Programs and Ozone Action Program	4.6-5.1	7.4-7.8
School-Based Public Awareness		
We Care Programs Promotion		
Outreach and Education		
Transit Strategies		
Voluntary No Drive Days		
Voluntary No Burn Days		
Legislative Initiative		
Bicycle Promotion and Improvement		
Work/Rail/Non-work Trips		
Land Use Planning		
Promote Community Centers and Transportation Centers	1.1	1.0
Subtotal	5.8 - 8.0	8.5 - 10.7
Total	**45.5 - 47.7**	**53.9 - 58.9**

EXISTING AND ANTICIPATED CONTROL MEASURES

Existing Measures (by summer 1996)

The stakeholders assume the following strategies are required by the Clean Air Act Amendments and the Pennsylvania Air Pollution Control Act:

NOx Reasonably Available Control Technology (RACT)
VOC RACT fix-up
New Federal Motor Vehicle Emission Standards
Phase II Gasoline Volatility Reductions
Phase I Federal Reformulated Gasoline
Stage I Terminal Controls (Required at Service Stations before 1990)
Stage II Vapor Recovery—Service Stations
Improved Rule Effectiveness
VOC Controls at Hazardous Waste Treatment, Storage and Disposal Facilities

Anticipated Measures

The stakeholders assume the following strategies will be fully implemented as required by the Clean Air Act Amendments:

Highway Vehicles
- Federal Reformulated Gasoline—Phase II (5-county area)
- High-Enhanced Inspection and Maintenance (5-county area)
  - The Stakeholders assume the recommended control strategies contained in this report will include a Decentralized, High-Enhanced Vehicle Inspection and Maintenance program. A separate Inspection and Maintenance Working Group is developing recommendations for program implementation. A pilot program will be underway in early 1997.

MACT Standards—Clean Air Act Title III (National)
- Petroleum Refinery
- Printing and Publishing
- Marine Vessel Loading

National Rules/Control Technique Guidelines (National)
- Architectural and Industrial Maintenance Coatings
- Consumer Products Rule
- Autobody Refinishing

Fuel Combustors (Ozone Transport Region)
- OTC Stationary Source NOx Memorandum of Understanding (MOU)—Phase II Controls (see attached NOx MOU)

Non-Road Engines/Vehicles (National)
- Federal Emissions Standards by Engine Type

RECOMMENDED EMISSION CONTROL STRATEGIES

Introduction

The stakeholders attempted to reach consensus on a package of emission control strategies. The results of their discussion follows. Estimated emission reductions for the following control measures are listed in the table on page 8. For a list of control strategies considered by the stakeholders, refer to Appendix C.

Funding Consistency

The stakeholders agree that federal, state, regional and metropolitan planning organization (MPO) funding should be consistent with the recommendations in this document.

Area Source Emissions

Auto and Truck Body VOC Content Limits

The stakeholders recommend limiting the VOC content of auto body refinishing products to the South Coast Air Quality Management District (SCAQMD) Standard.

Auto and Truck Body Refinishing

The Pennsylvania Department of Environmental Protection should pursue improvements in the auto and truck body repair industry to address improper handling, application and disposal of products containing VOC. Most of the stakeholders support state-wide limits on the sale of paint containing VOC to auto and truck body repair shops to only those that have hazardous waste generation ID numbers, equipment to control VOC emissions and industry-funded training for employees handling and using the products.

Degreasing

The stakeholders recommend requiring the use of citric-based, water-based and other low VOC degreasers for commercial and industrial sources using VOC-containing degreasing solvents during the production, repair, maintenance or servicing of parts, products, tools, machinery, equipment or general work areas, using SCAQMD as a model. The stakeholders recommend that the control apply to all persons who store and dispose of VOC-containing materials used in degreasing. The stakeholders recommend exempting degreasing solvents with less than a 0.1 psi vapor pressure.

Gasoline Service Stations: Stage II Vapor Recovery Systems

The stakeholders recommend that service stations with vacuum assist systems be required to install pressure vacuum valves on vent lines on underground storage tanks to further reduce VOC emissions. Stations switching from a balance system to a vacuum assist system should be required to install pressure vacuum valves.

Lawn Care

The stakeholders recommend that the state ban the use of non-commercial gasoline-powered lawn mowers and other gasoline-powered lawn equipment on Ozone Action Days. Most of the stakeholders recommend extending this ban to commercial lawn services.

Mobile Source Emissions

Additional Remote Sensing (on-road emission screening)

Recognizing the role new technologies can play in reducing mobile source emissions, the stakeholders recommend expanding the enhanced inspection and maintenance (I/M) remote sensing program beyond the proposed Pennsylvania State Implementation Plan (SIP) for Inspection and Maintenance. If remote sensing identifies an automobile registered outside the I/M testing area, the Commonwealth should request voluntary correction of the emission problem.

Heavy-Duty Diesel NOx Research

The stakeholders recommend that the Commonwealth initiate a research project to determine the NOx levels from heavy-duty diesel vehicles. If the research indicates significant NOx increases (in excess of manufacturer specifications), the stakeholders recommend the Commonwealth adopt appropriate NOx standards and initiate an inspection and repair program. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

Air Quality Benefits From Existing Transportation Programs

The stakeholders recommend that the appropriate Commonwealth agencies determine the air quality value of programs such as transportation management and intelligent transportation systems (ramp metering, EZ Pass, smart route, etc.) and gas cap replacement programs. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

National Low Emission Vehicle

The stakeholders recommend the Commonwealth implement the National Low Emission Vehicle (NLEV) because of its national focus and cost-effectiveness. In the absence of NLEV, the stakeholders recommend the Commonwealth implement the Ozone Transport Commission Low Emission Vehicle (OTC LEV).

Alternative Fuels Programs

The stakeholders support continuation and expansion of voluntary liquefied petroleum gas (LPG), compressed natural gas (CNG) and other alternative fuels programs at refueling sites, including toll roads, to encourage the use of alternative fuels. The stakeholders also recommend expanded funding of the alternative fuel incentives program at the current match level to encourage the purchase and conversion of public and commercial fleets.

Airport Emission Controls

Stakeholders recommend efforts to control emissions from shuttle buses, ground support equipment and auxiliary power units at Pennsylvania's commercial airports and major transportation points to reduce NOx and VOC emissions. While the stakeholders believe that specific measures should be left to the discretion of the individual facilities, the stakeholders strongly recommend these facilities use alternative fuels wherever possible. The stakeholders also recommend that measures be taken to restrict curbside idling at airports and other transportation hubs statewide. The Department of Environmental Protection and commercial airports should negotiate emission targets for overall emissions.

Fuel Changes Beyond 5-County Area

The stakeholders agree that a fuel change in contiguous counties (Lancaster, Berks, Lehigh and Northampton counties) would be helpful in reaching attainment. The stakeholders did not reach consensus on expanding the use of reformulated gasoline (RFG) to selected areas beyond the five county Consolidated Metropolitan Statistical Area (CMSA). During the discussion, the stakeholders considered three options:

- Federal RFG
- low reid vapor pressure (RVP) gasoline with VOC and toxics reductions equal to RFG
- a supplier option to provide low RVP gasoline or RFG, with a contingency to provide RFG if the attainment goal is not reached.

No option received consensus support, although significant support exists for each option. Those who support expanding the area for RFG cite the greater ozone reduction, the NOx reduction beginning in the year 2000, the lower than expected cost

and the secondary toxics benefit as reasons why RFG is preferable. Those who support the low RVP proposals cite the cost-effectiveness of RVP as a control measure and are concerned over the increased cost of RFG. (Given this disagreement, the emission reduction table on page 8 does not reflect an emission reduction.)

Southeast Pennsylvania Transportation Authority (SEPTA)

SEPTA is changing its operations and upgrading its equipment in ways that should improve air quality. Although these improvements are not motivated primarily by the air quality benefit, the secondary regional air quality benefit should be accounted for in the Commonwealth's SIP.

Clean Diesel
The stakeholders support SEPTA's Clean Diesel program including SEPTA's plan to purchase 400 Cleaner Diesel Icarus buses, and the potential purchase of 200 additional cleaner diesel buses. SEPTA will determine an additional bus purchase strategy in the near future; a decision is likely within the time frame of the development of Pennsylvania's Attainment SIP. (Because of uncertainty associated with the 200 buses, there is no estimated emission reduction in the table on page 8 of this report.)

Park and Ride
The stakeholders support SEPTA's short-term park and ride lot expansion on the regional rail system—approximately 4500 spaces.

Headway Improvements
The stakeholders support SEPTA's rail service headway improvements on the R7 regional rail line (up to 5 trains/hour) in conjunction with the I-95 highway reconstruction project .

Improvements to Suburban Bus Service
Stakeholders recommend that the state find ways to assist SEPTA to expand public transit to suburban Philadelphia. The stakeholders also recommend that public and private partnerships be pursued to fund these efforts. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

CNG Buses
Possible purchase of 70 to 100 CNG-fueled buses for SEPTA's Frontier Division. SEPTA will continue to review the viability of this project and will determine whether a commitment can be made within the time frame of the development of Pennsylvania's Attainment SIP. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

Stationary Sources

Utility Boilers

The stakeholders support Phase III NOx reductions for utility boilers as described in the NOx MOU, if they occur state-wide (see attached NOx MOU, Appendix B). The Department of Environmental Protection should pursue implementation of fair-share reduction requirements for utility boilers throughout the Ozone Transport Assessment Group (OTAG) region.

Heaters/Boilers

The stakeholders recommend expanding emission controls to some boilers, process heaters and other combustion units not currently included in the NOx MOU. Emission reduction requirements should apply to combustion units with rated heat inputs greater than 100 mmbtu/hour heat input and less than 250 mmbtu/hour heat input. Reductions should be based on a cost-effectiveness analysis for each boiler/heater similar to RACT with a $3000/ton threshold for installation of controls. The baseline to be used in the analysis is the average of the actual post-RACT ozone season operations of the boiler/heater for the previous three years. Boilers and heaters that are already below an average of 0.2 lbs/mmbtu emissions rate during the ozone season will be exempt from further reductions.

Reciprocating Internal Combustion Engines

The stakeholders recommend NOx control technologies such as selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR) or low emission combustion technology to reduce emissions from stationary internal combustion engines to at or below 2 grams/brake horse power hour, except emergency generators, unless they are used primarily during high ozone days. Stakeholders recommend that the Department of Environmental Protection base these measures on rated engine capacity of 1000 horse power or larger. We further recommend that permit restrictions be made available to those facilities that either underutilize their engines or have special circumstances. In such cases, the permit restriction should be designed so that facilities operating under the restrictions cannot produce emissions beyond a specified level and that this level is verifiable and enforceable.

Shutdowns

The stakeholders support flexibility in how emission reductions from shutdowns are used. (There is no estimated emission reduction in the table on page 8 of this report.)

Trading Programs

By consensus, the stakeholders recommend that the state implement an emission reduction credit trading program to harness market mechanisms and to encourage innovation and competition in the private sector to achieve emission reductions.

The stakeholders support the maximum feasible innovation and flexibility in the design of any trading program, provided that the reductions are:

1) quantifiable,
2) verifiable,
3) surplus,
4) enforceable, and
5) the transaction includes a benefit for the environment.

The Commonwealth should require that protocols for generating and using emission credits support the five principles listed above and provide for the following:

- A one-time emission reduction can generate a credit only if traded for a one-time emission.
- Trading mechanisms, including inter-sector trading, should produce transactions with comparable air quality benefits.
- Any trading program should consider the seasonal effects of credit generation and use on air quality. An unresolved point in stakeholder deliberations was that trading non-ozone-season emissions for ozone-season emissions may reduce the likelihood of attainment.

The stakeholders differ over other details of a trading program:

Inter-Pollutant Trading—Some stakeholders are opposed to trading one kind of pollutant for another because they believe that differences in toxicity between different VOC should render them untradable for one another. In addition, some oppose trading NOx for VOC and recommend limiting the trading to NOx for NOx and similar VOC for similar VOC. Most believe that a vibrant market requires having flexibility to trade between different pollutants and that appropriate trading ratios can be established among different VOC and between VOC and NOx.

Geography—The location of the emission reduction and the location of the traded emissions is of concern to some stakeholders. They are concerned that businesses and residents near the facility that purchases the emission credit will be unwilling to accept a higher level of emission than would have occurred without a trading program.

Open Market Trading—The stakeholders remain in disagreement about perhaps the most fundamental question—whether the trading should occur through a hybrid system of open-market trading and a cap-and-trade program, or exclusively through a cap-and-

trade program. Most of the stakeholders support a hybrid approach. Some stakeholders support only a cap-and-trade approach.

Voluntary Measures

The stakeholders recommend voluntary emission reduction programs to augment the emission reductions from regulatory controls. The stakeholders recommend that EPA provide recognition and incentives for voluntary measures.

Energy Conservation

The stakeholders recommend that the Commonwealth promote and support energy conservation programs and work with local governments and federal agencies to encourage participation in these programs.

Mobility Alternatives

The stakeholders recommend that the Department of Environmental Protection support and encourage a comprehensive Mobility Alternatives Program, including the following elements:

- a voluntary regional ride-sharing program to encourage public transit and ride sharing including employer participation incentives,
- promotion and expansion of the *Transitchek* program to further encourage the use of regional mass transit and ride sharing,
- a telecommuting program to provide incentives to area businesses to reduce commuting traffic and
- encouragement of alternative work schedules to stagger commuter traffic on area highways.

Educational Programs

The stakeholders recommend that the Department of Environmental Protection pursue other educational programs including the following voluntary and community education efforts:

- a school-based program to promote knowledge of the ozone problem and the actions that lead to emission reductions,
- a business-based program to promote voluntary pollution prevention and best-management-practices programs and
- a media-based program to alert the general public to days when ozone is forecast to be unhealthful and to request ozone-reducing actions.

Ozone Action Program

The stakeholders recommend continuation of existing efforts to predict and announce high ozone days as part of an ozone action program and as part of other recommended control strategies that take effect on high ozone days. The stakeholders further recommend an ozone action program that will include the following elements:

- transit strategies that will encourage transit use through incentives available on ozone action days,
- promote a variety of voluntary ways to eliminate single-occupant vehicle travel on ozone action days, primarily by eliminating unnecessary automobile trips and
- encourage citizens in southeastern Pennsylvania to eliminate open burning voluntarily on ozone action days.

Bicycle Promotion and Improvements

- The stakeholders further recommend that the Commonwealth encourage the use of bicycles (or other non-motorized means of travel) as substitute for short automobile trips. In order to promote bicycle use, the Commonwealth is urged to carry out bicycle and pedestrian improvements designed to offer safe and comfortable right-of-way. The stakeholders urge the Commonwealth to develop comprehensive bicycle improvements at regional facilities, including improvements at 14 selected rail stations, and expand non-motorized programs.

Legislative Initiatives

Land Use Planning-Promote Community Centers and Transportation Centers

The stakeholders support and recommend that legislative initiatives be pursued to give county and municipal planning agencies greater powers and incentives to promote cooperative and comprehensive regional, county and local plans and coordinated implementation strategies, based on the concepts of compact community centers and transportation centers. Such centers would help to foster more concentrated development patterns, reduce unnecessary trips and facilitate choice in travel such as pedestrian, bicycle and public transit modes.

Fuel Quality

The stakeholders recommend that the Commonwealth implement a fuel quality testing program.

Funding

Funding

The stakeholders disagreed about whether to include recommendations about funding specific projects or organizations. The stakeholders discussed increasing dedicated public transit funding but did not agree to make a recommendation.

APPENDIX A

Organizations/Stakeholders Invited To Participate In The Stakeholders Process

Philadelphia Stakeholders	Representative	
Area Sources/Small Business	Mark Hammond	Graphic Arts/Printing
Area Sources	Jim Bauer	Coatings
Large Business/Employee Trips	Martha Anderson	Thomas Jefferson Hospital
Stationary Source/Economic Development	Tony Ippolito	Sun Oil
Stationary Source	Susan Verzilli	Rohm and Haas
Large Business/Mobile Sources	Ned Griffith	ARCO Chemical
Transportation Sector/Suburban County	Jill Welch	Delaware County TMA
Transportation Sector	Rich Bickel	Septa
Transportation /Small Business	David Lee	I and M Working Group
Transportation /Mobile Sources	Jack Weber	AAA
Transportation Sector	Jim Perudo	New Car Dealers
Mobile Sources/Small Business	Larry Potts	Service Stations
Health	Norm Childs	American Lung
Health/Citizen	Dr. Robin Foster-Drain	To Our Children's Future With Health
Environmental	Shirley Loveless	Pennsylvania Environmental Council
Environmental	Joe Minott	Clean Air Council
Environmental	Nancy Parks	Sierra Club
Local Government	Pat O'Neill	City of Philadelphia
Public-Private/Transportation	Peter Quinn	GVFTMA

Regional Government	Rob Roggenburk	DVRPC
State	Jim Rue	DEP
State	Fran Carlini	DEP
State	Andy Warren	DOT
State	Audrey Minor	DOT
Federal	Tom Maslany	EPA

APPENDIX B

NOx Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
AMONG THE STATES OF THE OZONE TRANSPORT COMMISSION
ON DEVELOPMENT OF A REGIONAL STRATEGY CONCERNING THE CONTROL OF STATIONARY SOURCE NITROGEN OXIDE EMISSIONS

WHEREAS, the States of the Ozone Transport Commission (OTC) face a pervasive problem in their efforts to attain the National Ambient Air Quality Standard (NAAQS) for ozone; and

WHEREAS, a 1991 National Academy of Sciences study on ground-level ozone indicates that a combination of reductions in emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx) will be necessary to bring the entire Ozone Transport Region (OTR) into attainment by the statutory attainment dates; and

WHEREAS, modeling and other studies confirm that NOx emission reductions are effective in reducing ozone formation and help to reduce ozone transport; and

WHEREAS, the States of the OTC are requiring major stationary sources of NOx to implement reasonably available control technology (RACT); and

WHEREAS, by November 15, 1994, the States must submit attainment demonstrations to EPA as State Implementation Plan (SIP) revisions; and

WHEREAS, the implementation of RACT for the control of NOx emissions will not be sufficient to enable all States in the OTR to reach attainment; and

WHEREAS, the undersigned States seek to develop an effective regional program to reduce NOx emissions, which would be implemented in conjunction with other measures to control ozone precursors (including state-specific measures, regional measures and Federal measures required under the Clean Air Act); and

WHEREAS, these measures together may enable EPA to approve the States' SIPs and refrain from imposing sanctions that could restrict economic growth throughout the OTR; and

WHEREAS, information that the States have collected in their emissions inventories shows that large boilers and other large indirect heat exchangers are the source of a substantial portion of the NOx emissions in the States, and will continue to be so after they implement RACT;

WHEREAS, the States intend to complete a reevaluation of stationary source controls for 2003 and beyond in 1997, based on results of EPA-approved models and other relevant technical data;

THEREFORE, the undersigned member States hereby agree to propose regulations and/or legislation for the control of NOx emission from boilers and other indirect heat exchangers with a maximum gross heat input rate of at least 250 million BTU per hour; and

FURTHERMORE, that the States agree to propose regulations that reflect the difference in conditions in (i) the OTR's "Northern Zone" consisting of the northern portion of the OTR: (ii) the OTR's "Inner Zone" consisting of the central eastern portion of the OTR: and (iii) the OTR's "Outer Zone" consisting of the remainder of the OTR; and

FURTHERMORE, that to establish a credible emissions budget, the States agree to propose regulations that require enforceable specific reductions in NOx emissions from the actual 1990 emissions set forth in each State's 1990 inventory submitted to EPA in compliance with_'182(a) (1) of the Clean Air Act or in a similar emissions inventory prepared for each attainment area (provided that for exceptional circumstances that a more representative base year may be applied to individual sources in a manner acceptable to EPA) subject to public notice; and

FURTHERMORE. that the States agree to develop a budget in a manner acceptable to EPA based on the principles above no later than March 1, 1995; and

FURTHERMORE, if such a budget is not developed by March 1, 1995, that the 1990 interim inventory used by EPA in its Regional Oxidant Model simulations for the 1994 OTC Fall Meeting will be used for the budget; and

FURTHERMORE, that the States agree to propose regulations that require subject sources in the Inner Zone to reduce their rate of NOx emissions by 65 percent from base year levels by May 1, 1999, or to emit NOx at a rate no greater than 0.2 pounds per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require subject sources in the Outer Zone to reduce their rate of NOx emissions by 55 percent from base year levels by May 1, 1999, or to emit NOx at a rate no greater than 0.2 pounds per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require sources in the Inner Zone and the Outer Zone to reduce their rate of NOx emissions by 75 percent from base year levels by May 1, 2003, or to emit NOx at a rate no greater than 0.15 pounds per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require subject sources in the Northern Zone to reduce their rate of NOx emissions by 55 percent from base year levels by May 1, 2003, or to emit NOx at a rate no greater than 0.2 pounds per million BTU; and

FURTHERMORE, that the States agree to develop a regionwide trading mechanism in consultation with EPA; and

FURTHERMORE, that in lieu of proposing the regulations described above, a State may propose regulations that achieve an equivalent reduction in stationary source NOx emissions in an equitable manner; and

FURTHERMORE, that the regulations for May 1, 2003 described above may be modified if (i) additional modeling and other scientific analysis shows that the regulations as modified together with regulations governing VOC emissions, will achieve attainment of the ozone NAAQS across the OTR, and (ii) this Memorandum of Understanding is modified to reflect those modeling results and other analysis no later than December 31, 1998; and

FURTHERMORE, that the States agree to propose regulations that are otherwise consistent with the attached recommendations of the OTC's Stationary/Area Source Committee; and

FURTHERMORE, that the undersigned States agree to request that the EPA Administrator determine whether the SIPs of States outside the OTR contain adequate provisions to prohibit the emission of air pollutants in amounts that will contribute significantly to nonattainment of a National Ambient Air Quality Standard (NAAQS) within the OTR, as required under 42 U.S.C. Section 110(a)(2)(D).

APPENDIX C

Control Measures Summary

SE Pennsylvania Ozone Stakeholders Group
Control Measures Summary

Measure No.	Source Category	Control Measure	VOC 2005 Emissions tpd	VOC 2005 Emission Reduction tpd	VOC Cost Per Ton	NO_x 2005 Emissions tpd	NO_x 2005 Emission Reduction tpd	NO_x Cost Per Ton
Primary Control Measures Under Consideration								
1	Industrial Surface Coating	Add-on Controls or VOC Content Limits				0	N/A	
	Wood Furniture - Point	1997 SCAQMD Limits	0.3	0.1	25			
	Wood Furniture - Area	CTG Limits	2.9	1.0	1,800-5,900			
	Auto Body	none (more stringent levels were not identified)	0.4	0	0			
	Can Coating	CARB RACT/BARCT	9.0	2.2	4,000-5,000			
	Misc. Metal Parts	CARB RACT/BARCT	2.2	0.7	4,260			
	Plastic/Rubber/Glass Parts	SCAQMD Limits	0.3	0.2	1,110			
	Fabric/Paper Coating	SCAQMD Limits	23.1	5.5	4,000-5,000			
	Vinyl Coating	SCAQMD Limits	N/A	41%	4,000-5,000			
	Magnet Wire	none (more stringent levels were not identified)	N/A	0				
	Coil Coating	CARB RACT/BARCT	0.9	0.3	4,000-5,000			
	Metal Furniture/Appl.	CARB RACT/BARCT	7.5	1.5	4,000-5,000			
	Industrial Adhesives	SCAQMD Limits	0.9	0.8	800-6,800	0	N/A	
2	Surface Coating - Aerospace	Extend RACT, VOC Content Limit						
	Aerospace Ctg. - Point	none (assumed to be covered by MACT)		0	0			
	Aerospace Ctg. - Area	MACT/SCAQMD limits	0.5	0.3	4,000-5,000			
3	Autobody Refinishing	VOC Content Limits; CA Best Available Retrofit Control Technology				0	N/A	
	Auto Ref. - Area	SCAQMD Limits	10.8	3.8	3,700			
4	Surface Cleaning/Degreasing	CARB's Best Available Control Technology; Low-VOC Solvents				0	N/A	
	Surface Cleaning/Degreasing	SCAQMD Limits	14.8	5.9	Cost Saving $100			
5	Gasoline Service Stations: Underground Storage Tanks	Install Pressure Vacuum (PV) Valves on Vent Line	0.2	0	20-615	0	N/A	

7	Petroleum Refinery Fugitive Emission Leaks	Inspection and Maintenance Program				0		
	Refinery Fugitives	More Stringent LDAR	5.3	1.0	680-1,150	0		
8	Rule Effectiveness Improvements	Increase Compliance with Regulations						
	Rule Effectiveness Improvements	Increased Compliance Activities		21.7	Unknown		0	
9	Web Offset Lithography	Carbon Adsorber				0		
	Web Offset Lithography	Beyond CTG Req. (e.g., carbon adsorp.)	0.7	~0	Unknown			
10	Graphic Arts	Low-VOC Inks and Cleaning Solvents				0		
	Graphic Arts	Extend RACT to Small Sources	2.4	1.5	3,500-4,800		N/A	
12	Pesticides	Reformulation to Lower VOC Content				0		
	Pesticides	CA FIP Rule	1.4	0.3	1,000			
13	Utility Boilers							
	Coal-Fired Boiler	LNB + Overfire Air Plus (Phase 2 NO_x MOU)	0.3			10.8		
	Coal-Fired Boiler	Selective Catalytic Reduction (SCR)	0.3			10.8	4.0	4,000
	Oil/Gas-Fired Boiler	LNB	0.8			23.2		
		SCR					9.0	4,400
14	Industrial Boilers		1.0			29.0		
	Coal-Fired	LNB	0.1			3.3	1.8	2,400
	Gas/Oil-Fired	LNB + Flue Gas Recirculation (FGR)				25.3	16.5	2,000-4,000
18	Glass Manufacturing	LNB	0			1.6		
		SCR					1.2	800-2,950
		Oxy-Firing					1.2	2,150-5,300
19	Gas Turbines: Natural Gas	LNB SCR + Steam Injection	0	0		0	0	3,580-10,800
20	Gas Turbines: Oil	Water Injection NSCR + Water Injection	0.6	0		6.6	4.0	2,690-8,100
21	Reciprocating IC Engines: Diesel/Oil	Ignition Timing Retard	0	0		0.1		
		SCR					0.1	580-4,810
22	Reciprocating IC Engines: Natural Gas	Air/Fuel (AF) Ratio Adjustment + ITR	0.5	0		11.3		
		SCR					10.1	580-4,810
		NSCR					10.1	180-310
23	Process Heaters: Natural Gas or Oil	LNB + FGR	0.1	0		10.4	6.8	1,500-2,300

24	Iron and Steel Mills	LNB + FGR or LNB + SCR	0.4	0		1.0	0.8	800-2,960
		LNB + SCR					0.8	2,150-5,300
25	Industrial, Commercial, and Institutional Combustion	RACT to Small Sources	1.0	0		25.2	12.6	
		RACT (LNB) to Smaller Sources: Coal Oil/Gas				0.6 24.6	0.3 12.3	1,600 760-1,400
26	Residential Water Heaters	LNB	0	0		0.9	0.1	Unknown
27	Residential Space Heaters	LNB		0		0	0	0
28	Medical Waste Incinerators	SNCR	0	0		0	0	12,000
29	Municipal Waste Incinerators	SNCR	0	0		0.1	<0.1	1,000-4,000
31	Highway Vehicles and Stationary Sources	Ozone destroying paint - air handling systems, car radiators		0			0	
32	Asphalt Paving	Driveways - Non-HC Asphalt	1.6	0		0	0	N/A
33	Consumer Solvents	Driveways - Sealer Low VOC	0.16	0.01	237	0	0	N/A
34	Transportation	Land Use Planning - Promote Community Centers	66.6	1.06	17,500-19,100	105.8	0.96	--
35	Light-, Medium-, and Heavy-Duty Diesel Vehicles and Trucks	California Reformulated Diesel Program	2.8	0	N/A	11.3	0.8	$3,700-7,700
36	Light-Duty Gasoline Vehicles and Trucks	More Remote Sensing	63.8	1.2	3,340	94.5	0.6	--
37	Light-Duty Gasoline Vehicles and Trucks	Scrappage Programs	63.8	0.1	4,800	94.5	0.1	--
38	Heavy-Duty Diesel Trucks	Vehicle Emission Inspections	2.8	<0.1		11.3	0	
39	Light-, Medium-, and Heavy-Duty Diesel Vehicles and Trucks	Emission-Based Registration Fees	66.6	2.8	18,750	105.8	8.7	--
41	All Vehicles	Eliminate Excessive Curb Idling		0	0		0	0
42	Urban Buses	Emissions Reduction Credit for Heavy-Duty Buses						
42a	Highway Vehicles	Emissions Reduction Credit for Heavy-Duty Buses: Clean Diesel for SEPTA-baseline	2.8	.47	0	11.3	2.19	0
42b	Highway Vehicles	Alternative Fuel Vehicles SEPTA: CNG for Frontier Division Business	2.8	.01	457,800	11.3	0.23	26,700
43	All Vehicles	Smoking Vehicle Program	66.6	0.2	6,300	105.8	0	--
44	Highway Vehicles	Traffic Flow Improvements - Advanced Signal on 50 miles of Congested Arteries	66.6	0.15	21,620	105.8	0.16	
45	Highway Vehicles	Traffic Flow Improvements - CBD Signalization		0.35	125,048		0.27	
46	Highway Vehicles	Traffic Flow Improvements - Congestion/		0.16	200,452		0.07	

		Incident Management on Freeways						
47	Highway Vehicles	Traffic Flow Improvements - Ramp Metering		0.41	2,700		0.034	
48	Highway Vehicles	Traffic Flow Improvements - Enforce 55 mph on PA Turnpike		0.18	11,166		0.63	
51	Highway Vehicles	Transit Operations - Rail Headway Improvements - Planned R 7 Changes	66.6	0.04	369,600	105.8	0.06	246,400
55	Highway Vehicles	Transit Operations - Improve Suburban Bus Service		0.07	45,356		0.10	
56	Highway Vehicles	Transit Operations - Transit First Principles		0.02	123,079		0.02	
57	Highway Vehicles	Transit Operations - Reuse of Surplus Light Rail and Trackless Trolleys		0.01	92,277		0.01	
58	Highway Vehicles	Transit Operations - Improve City Transit Division Service		0.09	42,637		0.09	
59	Highway Vehicles	Transit Operations - Philadelphia to Harrisburg Rail Service Improvements		0.01	619,774		0.03	
61	Highway Vehicles	Transportation Management Plans - Comprehensive Regional Ridesharing Program		0.30	10,262		0.33	
62	Highway Vehicles	Transportation Management Plans - Availability and Promotion of Average $25 Transitchek		0.12	128,691		0.14	
63	Highway Vehicles	Transportation Management Plans - Telecommuting		0.59	14,272		0.68	
64	Highway Vehicles	Transportation Management Plans - Compressed Work Weeks		0.21	11,226		0.27	
69	Highway Vehicles	Parking Management - Construct New Park and Ride Lots Along Highways		0.05	139,991		0.08	
70	Highway Vehicles	Parking Management - Expand Parking at Rail Stations (combine with #69) Planned Expansion	66.6	0.03	274,150	105.8	0.04	169,950
71	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - Auto Work Trips		0.21	48,740		0.18	
72	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - 14 Rail Station Trips		0.00	65,513		0.00	
73	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - Non-work Trips		0.33	21,709		0.34	
74	Highway Vehicles	Emissions Reduction Programs - Removal of 50% of Pre-1980 Vehicles	66.6	0.4	57,354	105.8	0.3	

75	Highway Vehicles	Emissions Reduction Programs - Reduction in Cold Starts/Insulate Catalytic Converters		1.00	1,864		0.63	
76	Highway Vehicles	Emissions Reduction Programs - National LEV Program	66.6	11.5	1,860	105.8	13.5	
77	Highway Vehicles	Pricing Mechanisms - Feebate on New Car Purchase		0.28	4,393		0.17	
78	Highway Vehicles	Pricing Mechanisms - Gas Tax (84¢ per gallon)		5.20	(205,484)		8.70	
79	Highway Vehicles	Pricing Mechanisms - VMT Tax (4¢ per gallon)	66.6	5.20	(205,412)	105.8	8.70	
84	Highway Vehicles	Transit Operations - Grants to Non-profits to Promote Transit		0.016	52,700		0.023	35,800
91	Highway Vehicles	High Occupancy Vehicle Lanes	66.6	0.6	Very High	105.8	1.3	Very High
96	Highway Vehicles	LPG - Pilot Programs at Service Stations		2.41	11,200		1.42	
	Highway Vehicles	CNG - Pilot Programs at Service Stations	66.6	2.41	174,100	105.8	1.42	294,300
100	Highway Vehicles	Area Source Business - Credits for Alternative Fuel Vehicles			3,700-9,200			--
103	Marine Vessels	Control of Emissions (NO_x) from Ships and Ports	0	0	N/A	0	0	$10,000
104	Commercial Marine Vessels	Emission fees ($10,000 per ton NO_x)	0	0%	N/A	0	0	$10,000
105	Lawn and Garden	Emission Reduction Credits for Leaf Blowers; Electric Lawnmowers	30.1	3.0	1,200	1.3	0.1	62,000
106	Lawn and Garden	Incentives for Electric Lawnmowers	30.1	3.0	1,200	1.3	0.1	62,000
107	Nonroad	Nonroad Engine Emission Reduction Credit Programs	16.0	1.6	3,700-9,200	63.0	6.3	--
109	Aircraft	Control of Emissions from Aircraft and Ground Support Equipment	9.4	1.6	~0	10.7	0.23	$970
	Aircraft	CNG-fueled Shuttle Buses		0.01	730,200		0.05	--
	Aircraft	LPG-fueled Shuttle Buses		0.005	(207,500)		0.003	--
111	≥175 horsepower Compression Ignition (Diesel) Engines:	California Phase II Exhaust Standards and EPA Statement of Principles with Engine Manufacturers						
	Construction Equipment: Scrapers, Bore/Drill Rigs, Excavators, Cranes, Off-Highway Trucks, Rubber Tired Dozers, and Off-Highway Tractors Logging Equipment: Fellers/Bunchers		7.1	0	Unknown	43.3	0.8	Unknown
112	Recreational Vehicles		0.6			9.3		
	2-stroke engine category	Potential CARB Standards		0.3	60-700		0	N/A
	4-stroke engine category	Potential CARB Standards		0	60-700		0	N/A

113	Open Burning	Ban on High Ozone Days	0.23	0.18	~0	0.1	0.08	
114	Open Burning	Year Round Ban	0.23	0.18	~0	0.1	0.08	
116	All Lawn Care	Ban on High Ozone Days	30.1	11.2	0	1.3	6.7	
118	Motor Vehicles	Voluntary "No-Drive" Measure	63.1	5.1		92.6	7.4	
119	All Sources (or a Subset)	Cap and Trade			1,000-1,800			
120	All Sources (or a Subset)	Open Market Trade			1,000-1,800			
122	Various	School-Based Public Awareness Ozone Action		4.6	101,700		7.8	--
123	Various	Promote We Care Programs to Businesses		Included in 122				
124	Various	Outreach and Education - Environmentally Responsible Behavior - Green Light		Included in 122				
126	Various	Buying Emission Reduction Credits So They Cannot be Used (NO_x and VOC)			Market Price			Market Price
127	Various	Reduce ERCs by X% per Year While They Are in the Bank (NO_x and VOC)			Market Price			Market Price
129	Highway Vehicles	Ozone Action Days Transit Strategy	66.6	1.4	25,600	105.8	2.5	
130	Non-road Spark Ignition Engines <25 hp	No Non-road SI Engines Standard Because of NO_x Disbenefit		(21.0)			13.0	
131	Lawn & Garden Refueling	Leakless Gas Can Nozzles	2.5	2.2	1,400-5,800	0	0	N/A
Outside Five County Area Measures								
85	Highway Vehicles	Stage II - Entire Region (Beyond 5 County)	5.0	3.3	900	0	0	
128	Highway Vehicles and Non-road	Expand Reform Gas Area to Counties North and West of Five County Area	56.0	14.8	5,800-10,300	67.0	4.0	--

Demoted Measures								
6	Bulk Terminals	Vapor Recovery System						
11	Adhesives: Industrial	Reformulation and Product Substitution				0		
15	Adipic Acid Manufacturing Plants	Thermal Reduction	0			0		
16	Nitric Acid Manufacturing Plants	Extended Absorption	0			0		
		SCR						
		Nonselective Catalytic Reduction (NSCR)						
17	Cement Manufacturing	LNB SCR SNCR (Urea-based)	0			0		
30	Various	Small Business Tax Incentives						
40	Light-Duty Vehicles and Light-Duty Trucks	Eliminate Excessive Car Dealership Vehicle Starts						
49	Highway Vehicles	Transit Operations - Restore Regional Rail Service		0.01	857,915		0.02	
50	Highway Vehicles	Transit Operations - Extension of Route 66 Trackless Trolley		0.00	952,400		0.00	
52	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 10%	66.6	0.09	109,255	105.8	0.13	
53	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 20%		0.20	99,102		0.26	
54	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 50%		0.47	112,247		0.69	
60	Highway Vehicles	Transportation Management Plans - ETRP		1.80	(36,649)		2.20	
65	Highway Vehicles	Parking Management - Prohibit New Parking Facilities in CBD		Negligible Impact	Negligible Impact		Negligible Impact	
66	Highway Vehicles	Parking Management - Limit Parking Facilities at New Suburban Employment Sites		0.08	(33,728)		0.08	
67	Highway Vehicles	Parking Management - $3 Parking Surcharge		1.90	(435,912)		2.50	
68	Highway Vehicles	Parking Management - $3 Parking Tax in the CBD		0.47	(43,909)		0.73	
80	Highway Vehicles	Pricing Mechanisms - Double Tolls on PA Turnpike During Peak Periods		0.01	0		0.00	
81	Highway Vehicles	Emission Reduction Programs - Alternative Fuels - SEPTA	2.8	0.14 (0.61 with 42a)	229,500 (53,300 with 42a)	11.3	2.4 (4.6 with 42c)	13,550 (7,100 with 42a)
82	Highway Vehicles	Transit Operations - Reduce SEPTA Fares July-August						

83	Highway Vehicles	Pricing Mechanisms - HOV Parking Rate Incentive						
86	Highway Vehicles	Stage II - Statewide		60-70%			0	
87	Highway Vehicles	Ride Sharing						
88	Highway Vehicles	Increase Mass Transit Ridership - Parking Taxes, Market Incentives						
89	Highway Vehicles	Flat Tax on Vehicles - $200?						
90	Highway Vehicles	Build Two-Tier Highways						
92	Highway Vehicles	Traffic Flow @ 45 mph						
93	Highway Vehicles	Insulate Catalytic Converters						
94	Highway Vehicles	Promote Telecommuting						
95	Highway Vehicles	Credits for Compressed Work Week						
97	Highway Vehicles	Non-Employee Trip Reduction - Health Clubs						
98	Highway Vehicles	Buy New Engines for SEPTA - CNG, LPG						
	Highway Vehicles	Buy New Engines for SEPTA - LNG - Fleet Replacement Program	2.8	.14 (.61 with 42a)	337,000 (78,300 with 42a)	11.3	2.4 (4.60 with 42a)	19,900 (10,400 with 42a)
99	Highway Vehicles	Clean Fleet Replacement for Institutions, Large Businesses						
	Highway Vehicles	Clean Fleet Replacement for Institutions, Large Business - Light-Duty Vehicles	66.6	2.89	12,400	105.8	1.71	20,900
101	Highway Vehicles	Voluntary ETR						
102	Highway Vehicles	Alternative Fuel Vehicle - Build Fuel Stations						
108	Locomotives	Regional Railroad NO_x Emissions Reduction Measure	0.8	0%		8.2	2.9-3.5%	
110	Locomotive Engines	Potential Federal NO_x Emission Standards Potential CA NO_x Emission Standards	0.8			8.2	3.3% 6.6%	
115	Commercial Lawn Care	Ban on High Ozone Days						
117	Recreational Boating	Ban on High Ozone Days	10.9			1.1		
121	All Sources (or a Subset)	Across the Board Emission Reductions						
125	Various	Environmental Think Tank						

APPENDIX D

Operating Agreements

OPERATING AGREEMENTS FOR STAKEHOLDER DELIBERATIONS
Finalized - May 6, 1996

PURPOSE

To recommend strategies for ozone attainment and maintenance based on the current health-based standards and the requirements of the Clean Air Acts.

ROLES

Stakeholder Representative Roles

Each member of the Ozone Stakeholder Working Group is expected to: (a) regularly attend and prepare for work sessions of the Ozone Stakeholder Working Group; (b) clearly articulate and represent the interests of his/her group, when appropriate; (c) listen to other points of view and try to understand the interests of others; (d) openly discuss issues with people who hold diverse views and participate in a cooperative problem solving procedure to resolve differences; (e) generate and evaluate options to address the needs expressed by the Ozone Stakeholder Working Group; (f) keep his/her constituent group(s) informed and solicit their input, when appropriate.

Facilitators

CDR Associates will provide facilitation services to the Ozone Stakeholder Working Group. The facilitators will design and implement discussion and decision making procedures to help the Working Group accomplish its goals. In consultation with the Process Advisory Committee, the facilitators will design work session agendas. They will conduct the meetings, provide a procedural structure, and make strategic suggestions as to how cooperative problem solving can be implemented. They will remain impartial toward the substance of the issues under discussion. Any decision that results from the facilitators' activities will be a group decision, not a decision of the facilitators. The facilitators will remain responsible to the whole group and not to one member or interest. The facilitators will enforce ground rules that are accepted by the group and that support the effective working relationship of the group.

Process Advisory Committee

The Process Advisory Committee (a subset of the stakeholders) will work with the facilitators to help with the process (develop agendas, frame issues, develop the problem solving process, etc.). Stakeholders may raise any procedural concerns with a member of the Process Advisory Committee or directly with the facilitators to improve the problem solving process.

Technical Consultants

The Ozone Stakeholder Working Group will solicit technical assistance as needed to inform the deliberations. Services might include data collection, modeling and analysis. The Commonwealth will provide the technical consultant to support the Ozone Stakeholder Working Group. In order to support the Ozone Stakeholder Working Group in a expeditious manner, the technical consultant will be selected from an existing PA Department of Transportation contract. Penn DOT will manage the administrative aspects of the contract; the substantive focus will be managed by the stakeholder group and its Data Advisory Committee. Individual stakeholders may bring additional information, collected through their own sources, into the stakeholder deliberations. The stakeholders may accept the information directly or refer it to the Data Advisory Committee.

Data Advisory Committee

The Data Advisory Committee (a subset of the stakeholders) will work with the facilitators and the stakeholders to help with technical questions, data collection, technical presentations, consultant selection and budget allocation.

DECISION MAKING

Consensus

The negotiators will use a consensus decision making process.

Consensus is an agreement built by identifying and exploring all parties' interests and by assembling a package agreement which satisfies these interests to the greatest extent possible. A consensus is reached when all parties agree that their major interests have been taken into consideration and addressed in a satisfactory manner so that they can support the decision of the group. The process of building consensus involves the development of alternatives and the assessment of the impacts of those alternatives. A consensus agreement is one that all parties can live with.

Consensus does not necessarily mean unanimity. Some parties may strongly endorse a particular solution while others may accept it as a workable agreement. Group members can participate in the consensus without embracing each element of the agreement with the same fervor as other members, or necessarily having each of his or her interests satisfied to the fullest extent. In a consensus agreement, the parties recognize that, given the combination of gains and trade-offs in the decision package and given the current circumstances and alternative options, the resulting agreement is the best one the involved parties can make at this time.

Key Principles of Consensus

- To achieve consensus, everyone in the group must actively participate.
- To participate fully and freely, all group members must have a common base of information and keep up-to-date on the progress of the group.
- A norm must be created in which everyone will feel comfortable to state his or her views and to disagree.
- A disagreement can illuminate unrecognized problems and serve as a catalyst for improving the decision.
- The goal of the group is to discover the unmet need that has produced an objection and to find a way to meet that need in a revised agreement, rather than to suppress the objection.
- Agreement on definition, principles and criteria should precede and become the underpinnings of substantive agreements.

If there are issues the stakeholders cannot resolve through consensus decision making, the stakeholders will summarize the issue and fully document the remaining differences, including the specific concerns of individual stakeholders. Implementing agencies will use this summary as they advance ozone attainment in line with their mandates and air quality responsibilities.

CONSTITUENTS

Informed constituencies will enhance the prospects for approval of the recommendations of the Working Group. The members of the Ozone Stakeholder Working Group who represent agencies or constituencies will inform their constituents on an ongoing basis as to the issues under discussion and the progress being made in the cooperative problem solving sessions. They will represent the interests of their constituent group and bring their constituents' concerns and ideas to the negotiation. Members of the Working Group may elect to hold regular meetings with their constituent group (a formal caucus), to provide copies of work session summaries to their constituents and request comments, and/or to communicate informally with their constituents as appropriate.

REPRESENTATION

To enhance creativity during meetings, individuals who represent agencies or constituencies are not expected to restrict themselves to the prior positions held by their agencies or constituencies. The goal of the stakeholder group is to have frank and open discussion of the issues in questions and the options to address the issues.

Therefore, ideas raised in the process of the dialogue, prior to agreement by the whole group, are for discussion purposes only and should not be construed to reflect the position of a stakeholder or to prematurely commit the group or any one stakeholder. Stakeholders are expected to serve as a continuous liaison so that the interests of any agency or constituency they represent are represented while the stakeholders give thorough consideration to new options.

ATTENDANCE

Participating in consensus decision making requires consistent attendance. Should a stakeholder be unable to attend, and should the stakeholder choose to nominate an alternate, an alternate may attend the meeting. Alternates must attend as many meetings as possible. Alternates may enter into the deliberations and into decision making when the stakeholder is not present. Alternates will not be allowed to keep the group from moving forward or delay a decision because they do not have knowledge or authority to decide. Stakeholder representatives and alternates are responsible for staying current with any sessions they are unable to attend. Stakeholders are not obligated to use the time dedicated to problem solving sessions to backtrack and accommodate those who have not attended a prior meeting.

SUPPORT

Stakeholders are encouraged to bring staff from their agency/organization and members of their constituency to support the problem solving process. Stakeholders can defer to those individuals when their expertise is required or when requested by the Working Group. The use of support staff must not disrupt stakeholder deliberations. Only stakeholder representatives and alternates (when the representative is absent) will enter into consensus decisions.

OBSERVERS

Ozone Stakeholder Working Group Meetings will be open to the public. Input by non-members may be useful to the Ozone Stakeholder Working Group. However, in order for the Working Group to achieve its mission, discussion and deliberation at Committee work sessions must be focused and manageable. Participation of non-members of the Working Group will be at the discretion of the Working Group. Opportunities for participation by non-members include:

1. Opportunity for non-members to discuss their views with members of the Working Group during breaks.

2. Scheduled time at the end of the work sessions for questions and comments from non-members (10 or 15 minutes).

COMMUNICATING WITH THE PUBLIC

The Ozone Stakeholder Working Group may elect to hold public meetings to provide information to the public on the Working Group's progress and/or to solicit input from the public.

Work session summaries will be available to the public upon request. The DEP Newsletter, UPDATE, will list meeting notices and agendas. Information, including meeting summaries, will also be posted on DEP's World Wide Web Public Participation Center.

DISCUSSION GUIDELINES

The following guidelines encourage productive negotiations. Members of the Ozone Stakeholder Working Group will commit to "best efforts" at following them and will give the facilitators the authority to enforce them:

- It is absolutely crucial that everyone have a chance to be heard and to hear others. Therefore, side conversations or interruptions while someone is speaking should be avoided.

- In order to give everyone a chance to talk, participants should be sensitive about the length and pertinence of their comments and the importance of encouraging participation from all members of the group.

- In order to maximize the productive time available, people should avoid repeating points that have already been adequately made by others, except to briefly indicate concurrence.

- It is important to remain open-minded about proposals, ideas, concerns, etc., while different points of view are being presented and discussed. Rather than label particular proposals as "good" or "bad," it will be useful to be open to the underlying concerns that are expressed in a proposal.

- Disagreement is inevitable, but **must** be focused on the issues involved rather than based on perceptions of motives or relationships and personalities.

- The consensus process is a cooperative, joint problem-solving effort. Therefore, members **must** avoid competitive behavior that denigrates other participants or that is disruptive to the work of the group.

- The work sessions will begin and end promptly at the scheduled times.

COMMUNICATING WITH THE MEDIA

Work sessions of the Ozone Stakeholder Working Group will be open to the public, including the media. The consensus process is a solution-oriented, problem solving approach, not a platform for lobbying the public through the media. The deliberations of the Ozone Stakeholder Working Group should not be used as opportunities for individual members to posture in order to gain the attention of the media.

If the Working Group as a whole decides that there is a need for the Group to communicate with the press, the Working Group members will designate a spokesperson(s) and/or draft a statement. Stakeholders can refer members of the press to CDR for questions about the process and to DEP for information about the stakeholder group's progress on substantive issues.

In communicating with the media and the general public, a clear distinction should be made between preliminary information, concept papers, or proposals under consideration and final decisions. It is important to differentiate between discussions and decisions. Preliminary documents will be marked with "DRAFT" or "FOR DISCUSSION PURPOSES ONLY."

Each stakeholder is free to speak with the press on behalf of the agency or constituency he or she represents and must make it clear to the press that the comments should not be attributed to the whole stakeholder group. No stakeholder will speak for the whole stakeholder group without express authorization by consensus of the stakeholder group. No stakeholder will characterize the point of view of other representatives.

EXTERNAL INITIATIVES

Stakeholders will disclose to the stakeholder group as a whole any potential initiatives or activities (e.g. law suits, legislative actions) that could impact the functioning of the stakeholder group or be of interest to the stakeholders. Stakeholders will provide the information in an open and timely manner. DEP, EPA, the City of Philadelphia and any other stakeholder will keep the group informed of any policy, regulation or legislation related to the ozone problem.

TASKS GROUPS

The Ozone Stakeholder Working Group may form task groups to perform specific functions or develop proposals on specific issues. Information and recommendations the task groups develop will be presented to the stakeholders for the Committee's consideration. The composition and scope of work for each task group will be designated by the stakeholders. The task groups may include technical support from non-members of the working group.

INSPECTION AND MAINTENANCE WORKING GROUP

While the ozone stakeholder group deliberates, a separate but related group will be working to outline the details of a successful, decentralized emissions program. The ozone stakeholder group is responsible for policy level recommendations about the emissions program's contribution to ozone attainment. The I and M Working Group will take policy direction from the ozone stakeholders and then is responsible for recommendations about the emission program's implementation.

APPENDIX E

Glossary

AQMD	air quality management district
BTU	British thermal unit
CAAA	Clean Airs Act Amendments of 1990
CFFV	clean fuel fleet vehicle
CMSA	consolidated metropolitan statistical area
CNG	compressed natural gas
DEP	Pennsylvania Department of Environmental Protection
DERs	discrete emissions reductions
DVRPC	Delaware Valley Regional Planning Commission
EPA	U.S. Environmental Protection Agency
ERC	emission reduction credit
FIP	Federal Implementation Plan
g/bhp-hr	grams per brake horsepower hour
I/M	inspection and maintenance
IC	internal combustion
LEV	low-emission vehicle
LNB	low NOx burner
LPG	liquefied petroleum gas
MACT	maximum achievable control technology
mmbtu	million BTU
MOU	memorandum of understanding
MPO	metropolitan planning organization
MTBE	methyl tertiary butyl ether
NAAQS	National Ambient Air Quality Standard(s)
NGV	natural gas vehicle
NLEV	national emission vehicle
NOx	nitrogen oxide
OBD I	phase I onboard diagnostics
OBD II	phase II onboard diagnostics
OBD	onboard diagnostic
OTAG	Ozone Transportation Assessment Group
OTC	Ozone Transport Commission
PennDOT	Pennsylvania Department of Transportation
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
PV	pressure vacuum
RACT	reasonable available control technology
RFG	reformulated gasoline
RVP	reid vapor pressure
SCR	selective catalytic reduction
SEPTA	Southeastern Pennsylvania Transportation Authority
SIP	state implementation plan
SCAQMD	South Coast Air Quality Management District
SNCR	selective non-catalytic reduction

TCMs	transportation control measures
tpd	tons per day
tpsd	tons per summer day
tpy	tons per year
VOC	volatile organic compounds