

FINAL

Ozone Early Action Plan (EAP)
to Attain and Maintain
the 8-hour Ozone
National Ambient Air Quality Standards
for the West Virginia Eastern Panhandle Region,
Berkeley and Jefferson Counties,
Pursuant to
The Ozone Early Action Compact (EAC)

December 28, 2004

Table of Contents

Introduction and Background Page 3

Air Quality Status of the Region..... Page 4

Existing West Virginia Ozone SIP Page 5

Air Quality Modeling..... Page 8

Existing Federal Control Measures..... Page 10

Adopted Local Control Measures Page 11

Calculation of Estimated Emission Reductions Page 13

Implementation of Final Measures Page 14

On-going Public and Stakeholder Involvement Measures..... Page 22

Maintenance for Growth..... Page 22

Conclusion Page 25

Appendices

- A. Early Action Compact: Initial Commitment
- B. Air Quality Task Force Membership along with
Public Participation Documentation
- C. Air Quality Modeling
- D. Environ (Emissions Reduction Analysis) Final Report
- E. School Bus Retrofit Documentation
- F. Maintenance for Growth: Emissions Projections Documentation

Introduction and Background

In 1997, the United States Environmental Protection Agency (EPA) established a new 8-hour ozone National Ambient Air Quality Standard (NAAQS). This standard was the result of a review of ground level ozone and related health impacts, and was designed to replace the older 1-hour standard. The creation of this new standard was meant to address the cumulative impact of ozone exposure at lower levels for a longer period of time. As such, the new standard is set at a lower level (0.08 parts per million) than the previous standard (0.120 parts per million) and is more protective of human health.

As part of the implementation of the new standard, states submitted area designation recommendations to the EPA in June of 2000 that identified potential ozone nonattainment areas based on air quality data during 1997 to 1999. The Eastern Panhandle area of West Virginia (Berkeley and Jefferson Counties) was identified at that time as one of the potential nonattainment areas, mainly based on the fact that the area was considered part of the Baltimore-Washington DC Metropolitan Statistical Area (MSA). No monitors were present in either Berkeley or Jefferson Counties during this period.

A number of concerns were raised by the potential nonattainment areas about the adverse impacts of a possible nonattainment designation. In response, the Eastern Panhandle area and West Virginia Department of Environmental Protection (WV DEP) began to investigate possible voluntary actions that could be implemented proactively to improve air quality and lessen the possible impact of a formal nonattainment designation in areas that marginally exceed the new standard.

The most promising of the options explored was the EPA's ozone Early Action Compact (EAC) program. The EAC concept was originally developed by several areas in Texas in early 2002 and subsequently endorsed and expanded by the EPA as a national voluntary program.

EACs are voluntary agreements by the localities, states, and the EPA to develop Early Action Plans (EAPs) to reduce ozone precursor pollutants and improve local air quality in a proactive manner, and in a shorter time than what would occur through the traditional nonattainment area designation and planning process. These plans must include the same components that make up traditional State Implementation Plans (SIPs). This includes emissions inventories, control strategies, schedules and commitments, and a demonstration of attainment based on photochemical modeling.

The goal of an EAP is to develop a comprehensive strategy that will bring an area into attainment of the 8-hour ozone standard by 2007. This goal is to be achieved by selecting and implementing local ozone precursor pollutant control measures that, when combined with other measures on the state and national level, are sufficient to bring the area into compliance with the standard. If the area is successful in developing a plan that

demonstrates attainment of the 8-hour ozone standard by 2007 and continued attainment through 2012, the EPA will defer the effective date of the nonattainment designation for the area. This deferral will remain in place as long as certain milestones are met, such as implementation of local controls by 2005. If all interim milestones are met and the area demonstrates attainment of the standard during the period from 2005 to 2007 through air quality data, then the nonattainment designations will be withdrawn by EPA, without further regulatory requirements. If an area fails at any point in the process, it will revert back to traditional nonattainment status, with all the associated requirements of such a designation.

The Eastern Panhandle area of West Virginia has entered into an Early Action Compact which includes both Berkeley and Jefferson Counties. This Compact was signed by all the parties involved and then submitted to the EPA by the required date (December 31, 2002). The area has subsequently established and empowered the Eastern Panhandle Air Quality Task Force to coordinate the development of the ozone early action plan for the area. This Task Force has a diverse and knowledgeable membership, which will greatly aid in the development of a comprehensive plan.

The Eastern Panhandle area, as well as the neighboring Winchester – Frederick County area in Virginia and Washington County area in Maryland, have many similarities including a common geographic location and characteristics, relatively mild nonattainment air quality levels, and common influences of ozone transport and other external factors. It is extremely important that air quality planning in the Eastern Panhandle be coordinated with Frederick and Washington Counties.

Air Quality Status of the Eastern Panhandle Region

Historically, there had been little reason to site an air pollution monitor in the region due to its relatively low population and largely rural nature. Subsequent growth in Berkeley and Jefferson Counties has largely been residential in character with few new large air pollution sources. Nevertheless, the DAQ set up and began operating an ozone monitor in Berkeley County (Martinsburg, WV) in calendar year 2000 with complete quality assured ozone season data becoming available starting in 2001. Data recorded during 2001-2003 in Martinsburg, considered representative of Berkeley and Jefferson Counties, yielded a three year design value of 86 parts per billion (ppb), which does not meet the 8-hour ozone standard. Based upon this violation and the area's participation in the EAC, EPA designated Berkeley and Jefferson Counties as "nonattainment deferred" with an effective date of 9/30/2005 (69 FR 23866). Recent air quality data is summarized in Table 1 below.

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**Table 1
Martinsburg, WV Air Quality Data**

	DATE	8 hr avg. ppm	1999- 2001 avg.	DATE	8 hr avg. ppm	2000- 2002 avg.	DATE	8 hr avg. ppm	2001- 2003 avg.	DATE	8 hr avg. ppm	2002- 2004 avg.
1st Max	5/2/01	.091	na	8/3/02	.094	na	6/25/03	.094	.093	7/3/04	.090	.092
2nd Max	5/3/01	.089	na	9/10/02	.090	na	6/24/03	.091	.090	7/2/04	.081	.087
3rd Max	5/4/01	.088	na	7/2/02	.089	na	7/30/03	.083	.086	8/24/04	.076	.082
4th Max	6/26/01	.088	na	8/21/02	.089	na	6/26/03	.082	.086	8/25/04	.071	.080

Existing West Virginia Ozone SIP

On December 17, 1977 the West Virginia Air Pollution Control Commission (WVAPCC, now the Division of Air Quality of the West Virginia Department of Environmental Protection) designated attainment/nonattainment areas with respect to the NAAQS at that time for photochemical oxidants throughout the state, pursuant to Section 107 of the Clean Air Act Amendments of 1977 (CAA). These designated areas were refined and resubmitted to USEPA on January 16, 1978, and it was jointly agreed that the Air Quality Control Region IV (Kanawha County and portions of Fayette County) would be the only AQCR in West Virginia designated nonattainment for photochemical oxidants (hereafter referred to as ozone). The remainder of the State, including Berkeley and Jefferson counties, would be designated as attainment or unclassifiable. The ozone designations became final on September 12, 1978 (43 FR 40502).

On November 15, 1979, West Virginia submitted to USEPA a revised SIP to attain and maintain the ozone NAAQS for AQCR IV. The SIP identified AQCR IV as a "rural" ozone nonattainment area with USEPA policy requiring only the control of VOCs from sources greater than 100 tons per year and subject to USEPA's Control Techniques Guidelines (CTG) documents. The emission inventory identified only three CTG-Reasonably Available Control Technology (RACT) source categories in the area for which existing sources exceeded the 100 tons/year level. Consequently, the SIP contained CTG-RACT based regulations controlling VOC emissions from only these source categories.

1. 45CSR21 - "To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds from the Storage of Petroleum Liquids in Fixed Roof Tanks".
2. 45CSR23 - "To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds from Bulk Gasoline Terminals.

3. 45CSR24 - "To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds from Petroleum Refinery Sources.

USEPA approved the SIP for ozone on August 14, 1980 (40 FR 54088) with a condition that West Virginia submit an adequate test method for 45CSR23 to USEPA for inclusion in the West Virginia SIP. The Governor submitted this test method to USEPA as a SIP revision on November 6, 1980.

On November 25, 1980, the state of West Virginia requested that USEPA approve a change in the designation of AQCR IV from nonattainment of the ozone NAAQS to attainment based on air quality data showing attainment for the years 1978-1980. USEPA approved this request in the November 9, 1981 Federal Register (46 FR 55261). The air quality maintenance plan for the area which included the previously mentioned and now fully implemented VOC-RACT regulations remained in effect.

As a result of CY 1988 ambient ozone measurements, USEPA notified West Virginia on November 8, 1989 that the State's ozone SIP was inadequate to assure attainment of the ozone NAAQS in Kanawha, Putnam, Cabell, Wayne, Wood and Greenbrier counties. Further, the CAAA were enacted in 1990 and pursuant to Section 107(d) of the Act, the aforementioned counties of Kanawha, Putnam, Cabell, Wayne and Wood were designated as moderate ozone nonattainment areas effective January 6, 1992. Greenbrier county was classified as a marginal nonattainment area.

Under Section 182(b)(2) of the CAAA, states must implement, in moderate ozone nonattainment areas, VOC-RACT for sources covered by pre- or post-amendment CTGs and for major sources of VOC emissions that are not covered by a CTG. West Virginia's June 4, 1991 SIP submittal fulfilled this requirement for the three pre-CAAA CTGs -- referred to as RACT "fix-ups". EPA approved West Virginia's SIP revision with respect to RACT "fix-ups" on September 17, 1992 (57 FR 42895). The Rules have been fully implemented at the facilities subject to the Rules.

In regard to new source review requirements under the CAA for attainment areas, on June 13, 1984, West Virginia requested that USEPA approve regulation 45CSR14 "Permits for the Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration" (PSD) as a revision to the state implementation plan. Following State response to USEPA identified inconsistencies with federal requirements, USEPA approved the PSD SIP revision in the April 11, 1986 Federal Register (51 FR 12517). West Virginia also enacted a regulation (45CSR19) for permitting of major sources and modifications in designated nonattainment areas pursuant to Clean Air Act requirements, and has implemented as part of its SIP since 1972, 45CSR13 "Permits for Construction, Modification, or Relocation of Stationary Sources of Air Pollutants, and Procedures for Registration and Evaluation" requiring construction/modification permits for all regulated emission sources.

The 1990 CAAA part "D" new source requirements for West Virginia's ozone nonattainment areas were not due for submission to USEPA until November 15, 1992. The West Virginia Air Pollution Control Commission, however, adopted (November 10, 1992) by Emergency Rule revisions to existing regulation 45CSR19 "Requirements for Pre-Construction Review, Determination of Emission Offsets for Proposed New or Modified Stationary Sources of Air Pollutants and Emission Trading for Intra-Source Pollutants" reflecting to the extent possible the new CAAA part D requirements (i.e. offsets), which will be enforced for ozone nonattainment areas until USEPA makes a decision on this redesignation request. Rule 45CSR19 was adopted as a Legislative Rule on July 7, 1993 and submitted to USEPA on August 10, 1993.

Section 176(c)(4) of the CAAA contains provisions for transportation planning activities to conform to air quality planning. West Virginia has worked closely with the WV Department of Transportation (WVDOT) and local planning agencies to assure that Transportation Improvement Programs (TIPs) in the nonattainment areas are consistent with air quality planning objectives and the SIP and meet USEPA's interim conformity guidance. West Virginia has adopted state rules that require compliance with the federal conformity rules (45CSR35, General Conformity and 45CSR36, Transportation Conformity).

The 1990 CAAA provided that in all areas of moderate or worse severity with respect to ozone NAAQS violations that motor vehicle inspection and maintenance programs (I/M) be implemented. The CAAA provided for "immediate" implementation of "basic" I/M programs in moderate areas. It should be noted that none of the West Virginia areas were designated as nonattainment areas prior to January 6, 1992 and accordingly there were no I/M requirements, regulations or facilities in existence when the 1990 CAAA were enacted. In view of this situation for areas like those in West Virginia, and the fact that EPA guidance and rules for development of these programs did not become available for some considerable period of time, USEPA has recognized that basic and enhanced I/M programs could not be practically moved forward prior to November 15, 1992. EPA, in its April 16, 1992 General Preamble to Title I and November 5, 1992 final I/M rule, believed the immediate requirement to be unreasonable and, therefore, revised the I/M SIP submittal schedule to November 15, 1993.

From the above, West Virginia demonstrated that I/M programs were not required prior to November 15, 1992. Furthermore, a basic I/M program was unnecessary to bring about attainment. EPA concurred with this assessment. The three urban areas

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(Charleston, Huntington and Parkersburg) were redesignated to attainment of the 1-hour ozone standard in 1994¹. Greenbrier County was redesignated to attainment in 1995².

Pursuant to the above, West Virginia believes it has met all pre-November 15, 1992 requirements under Section 110 and Part D of the CAA for ozone attainment and nonattainment areas as set forth in the 1977 CAA - further defined at 45 FR 21673 - "SIP Approval Criteria for Nonattainment Areas" - and as set forth in the 1990 CAAA.

Subsequently, the State revised 45CSR21 to adopt a number of federal Control Technique Guidelines (CTG) to reduce VOC emissions in the 1-hour ozone maintenance areas. EPA approved this as a revision to the SIP effective 04/03/95 (60 FR 6022). West Virginia also adopted rules to address the federal NOx SIP Call through SIP approved rules 45CSR1 and 45CSR26, effective 07/09/02 (67 FR 31733). The former requires NOx controls for non-electric generating units which have large boilers and also mandates control of cement plants, including one in the Eastern Panhandle. The latter requires NOx emission limits on electric generating units (EGU). Although none are located in the Eastern Panhandle, previous modeling done by EPA and regional air quality planning organizations shows that the region-wide emission reductions lower ozone levels throughout the entire area.

Finally, with respect to the 8-hour ozone standard, the State has three years after the June 15, 2004 nonattainment designations to submit a SIP revision demonstrating attainment of the designated nonattainment areas by the 2009 attainment date. The EAC SIP revision is due by December 31, 2004 and must demonstrate attainment by December 2007.

Air Quality Modeling

The purpose of this section is to outline the CAMx modeling results for the Early Action Compact (EAC) projects of Virginia, West Virginia and Maryland and to present the calculation of relative reduction factors and future year 8-hour ozone design values associated with monitors in the concerned EAC areas. This modeling project covers five EAC areas in Virginia, West Virginia and Maryland. The Virginia Department of Environmental Quality is the lead agency in conducting this modeling study. The August 8-18, 1999 ozone episode was selected and used for the EAC modeling project. The Comprehensive Air quality Model with extensions version 4.02 (CAMx) model was selected and used for the modeling project. The National Center for Atmospheric

¹Charleston: 59 Fed. Reg. 45985 (06 SEP 94); Parkersburg: Id. at 45978; and Huntington: 59 Fed. Reg. 65719 (21 DEC 94)

² Greenbrier: 60 Fed. Reg. 39911 (04 AUG 95)

Research (NCAR)/ Penn State Mesoscale Model, MM5, was employed to provide spatial and temporal distribution of meteorological fields to the CAMx air quality model. The MM5 simulation was performed with 3 nested domains, with respective grid resolution of 108 km, 36 km, and 12 km. The Sparse Matrix Operator Kernel Emissions (SMOKE) emissions model was used to process emission inventories into the formatted emission files required by the CAMx air quality model.

The CAMx base case model performance has been evaluated using statistical and graphical metrics for both 36 km and 12 km resolution modeling domains. The CAMx photochemical model meets or exceeds established U.S. EPA performance criteria for attainment demonstrations. The 2007 future emission inventories were developed for the modeling domains. The future year CAMx runs were performed with the same model configuration and meteorological fields developed for the base case runs. Relative reduction factors and future year 8-hour ozone design values at four monitors were calculated in accordance with the U.S. EPA's *Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS (1999)* and the U.S. EPA's *Protocol for Early Action Compacts (2003)*. The results indicate that the attainment test is passed at all the monitors, representing five EAC areas in three states during this modeling episode. The attainment demonstration relies on expected reductions from existing federal/regional programs (e.g. the NOx SIP Call and highway vehicle standards) as well as adopted local control measures.

EPA has developed draft procedures for using photochemical models to demonstrate attainment of the 8-hour ozone NAAQS. The critical elements are the calculation of relative reduction factors (RRFs) and future design values (DVs). The RRFs and base-year Design Values are the basis for projecting future year Design Values (DVF). All episode days with modeled base year daily maximum 8-hour ozone concentration greater than or equal to 70 ppb were used to calculate the RRF for the all monitors representing the five EAC areas in this study. Because the Martinsburg ozone monitor was not operating in 1999, the Winchester/Frederick County, Virginia monitor is used as a surrogate to determine the baseline design value and the associated relative reduction factor is used to demonstrate attainment for both areas. VADEQ recommended eleven episode days for simulations based on the observations of elevated 8-hour ozone concentrations. The episode days are from August 8 to August 18, 1999 wherein high ozone concentrations were measured. August 12 and August 13 were selected as primary episode days for 8-hour ozone attainment demonstration. The ozone episode of August 12-13, 1999 was typical of a regional episode in the area. Eight-hour average ozone concentrations peaked at 85 ppb at Frederick County on August 12th.

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Table 2
8-Hour Ozone Attainment Demonstration of Virginia and West Virginia EAC Areas
(The Frederick monitor is a surrogate for the Martinsburg monitor)

County/City	AIRS ID	1998-2000 Design Value, ppb	2001-2003 Design Value, ppb	Current Design Value
Frederick Co.	510870014	87	85	87

Attainment Test Results for Monitors in the Virginia EAC Areas (Max 9 Grid Cells)

County/City	Modeled Average Base-Year (1999) Daily 8-hr Maximum O3 (ppb)	Modeled Average Future-Year (2007) Daily 8-hr Maximum O3 (ppb)	Relative Reduction Factor (RRF)	Current Design Value (violating)	2007 Future Design Value Attainment	Number of Analysis Days	Pass/Fail Status
Frederick	78	73	0.94	87	81.8	6	PASS

Existing Federal Control Measures

Areas may take credit for existing federal, regional and state emission control measures in demonstrating attainment and maintenance of the NAAQS. However, the measures must be federally enforceable. Generally, areas rely on a combination of federal, regional, state and local measures to demonstrate attainment/maintenance. In any case, those measures relied upon must be federally enforceable. The attainment demonstration for the West Virginia Eastern Panhandle includes emission reductions from several federal programs, including but not limited to the following:

- Finding of Significant Contribution and Rulemakings for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone ("NOx SIP Call")
- Federal Exhaust Emission Standards for Light- Duty Vehicles (Passenger Cars) and Light- Duty Trucks
- Tier 2 Vehicle and Gasoline Sulfur program
- Heavy Duty Diesel Engine and Fuel Sulfur Program
- Non-Road Diesel Engine Standards – Tier I and Tier II

Adopted Local Control Measures

The City of Martinsburg and Berkeley and Jefferson Counties in West Virginia entered into an Ozone Early Action Compact in December of 2002. Discussions with county officials and local economic development authorities continued through the beginning of calendar year 2003. Representatives from the area also participated in Air Improvement Task Force meetings with neighboring Winchester – Frederick County in Virginia.

In late April, the Berkeley County Economic Development Authority, on behalf of Berkeley and Jefferson Counties, procured the professional services of Wilbur Smith Associates, a transportation/air quality planning firm to assist in facilitating Air Quality Task Force meetings and developing the required consensus-based documents for the June 16th and 30th submittals to US EPA.

A broad-based group of stakeholders was brought together in April 2003 which became the Eastern Panhandle Air Quality Task Force. The first meeting of the group was held in Martinsburg on April 23, 2003 with approximately 27 in attendance. The Task Force members include local government representatives from both counties and the City of Martinsburg, local business and industries, healthcare interests and environmental interests. State Departments of Transportation and Environmental Protection are also participants. (A complete listing of Air Quality Task Force Members is included as Appendix A.) Meetings of the Eastern Panhandle Air Quality Task Force have continued throughout 2003 and 2004. The task force originally focused on educational and informational activities so that members could understand the complexity of the air pollution issues facing the region. Task Force activities during fall 2003 focused on evaluating the specific emissions control strategies that might be appropriate for the region. During this period, the Task Force after examining a compilation of over 100 potential emissions control strategies selected 25 measures for an initial screening for potential feasibility. Environ Corporation, sub-consultant to Wilbur Smith Associates, performed the initial screening for the Task Force. The criteria used by the consultant for the screening were technical feasibility, potential emissions reductions, timeframe considerations, and potential US EPA acceptance, in terms of quantifiable and enforceable reductions. (A detailed discussion of the initial screening of measures is included in the attached Environ Final Report.)

The final set of control strategies was determined through the following procedure:

- Perform a preliminary screening on all emission control measures in the emission control strategies list by ranking the control measures based on their approximate contribution levels to the VOC and/or NO_x emission inventories, and past experience in program effectiveness and feasibility for these measures;

- Prepare a technical memo presenting the ranking of the emission control strategies, as well as documenting the data, methodology and assumptions used in developing the ranking after completing the initial screening of control strategies;
- Recommend the top ten emission control strategies from the emission control strategies list to perform further cost-effectiveness analyses, using in-house data and information, as well as relevant data obtained from technical publications related to those selected emission control strategies to assess the cost-effectiveness and implementation feasibility of the strategies. The cost and emission benefits associated with each control strategy used in the cost-effectiveness analysis will be based on the best available data and engineering estimates, and the feasibility assessment will be based on past program experience and engineering judgment;
- Prepare a report presenting the results of the cost-effectiveness analysis and feasibility assessment of the selected control strategies, as well as documenting the data, methodology, and assumptions used in the cost-effectiveness analysis and feasibility assessment.

The Task Force spent a considerable amount of time evaluating the information provided by Environ and questioned Environ Managing Principal, David Souten extensively regarding the evaluation. Environ went on to recommend the “top ten” emissions reduction strategies, strictly from a scientific standpoint. The group evaluated these recommendations and then with a few modifications, requested that Environ perform a more in-depth analysis.

Further analysis of the 11 remaining measures was performed by Environ and the results provided to the Air Quality Task Force. It was further decided that the measures would be divided into two categories for further consideration. The primary category of measures would be those that would be implemented as quickly as possible, but no later than 2005. The contingency category of measures would be those that would be considered for future implementation after the results of the modeling for the attainment demonstration is finished.

After submittal of the December 31st Progress Report, base-case and future case photochemical modeling was finished by the Virginia Department of Environmental Quality (VDEQ). That modeling has indicated that the Eastern Panhandle area will attain the 8-hour ozone standard by 2007 with the implementation of national and state control measures. Table 3 contains a complete listing of these measures. VDEQ completed additional analyses of the impacts of the selected local control measures. On March 9, 2004 the Executive Committee of the Eastern Panhandle Air Quality Task Force met to finalize selection of local emissions control measures and to discuss implementation of those measures. At the March 9th meeting it was decided that all previously identified

primary control measures should be implemented, with the exception of lower Reid Vapor Pressure (RVP) gasoline. This measure was removed from the primary list of measures and added to the contingency list of measures.

Table 3 on the following page includes the complete list of adopted primary local control measures for the Eastern Panhandle of WV Early Action Plan. These measures have been carefully selected based on stakeholder consultation and taking into consideration available resources and political constraints. These measures are realistic and have received broad public support.

Calculation of Estimated Emission Reductions

This section presents an example of how potential emission reductions were estimated. One of the primary control measures is the Ozone Action Days Program. This control strategy consists of employer-based and area sources ozone action days programs. These ozone action days programs would reduce some of the emissions mostly contributed by light-duty vehicles and trucks for the employer-based programs, and by area sources for the area sources program. The emission inventories for light-duty gasoline vehicles and trucks were estimated to be about 6.37 tons of VOC and 4.31 tons of NOx per day, in the Berkeley- Jefferson Counties. For area sources, the emission inventories were estimated to be about 14.80 tons of VOC and 2.18 tons of NOx per day. The potential emissions impact for this control strategy are difficult to quantify and enforce. This is consistent with the conclusions of the Tennessee EAC, San Francisco Bay Area MTC (Tennessee, 2003), and data from Sacramento Air Quality Management District (SMAQMD)'s Clean Air Plan Update (SMAQMD, 2003). As part of its Clean Air Plan Update, SMAQMD evaluated some ozone action days control strategies. In general, the estimated emission benefits from these programs were modest, ranging from 1 to 2%. The reported cost associated with ozone action days programs range from \$50,000 to \$100,000 per program, and the cost-effectiveness values for these type of programs range from \$3,000 to \$5,500 per ton of VOC + NOx emissions reduced (SMAQMD, 2003).

Barriers / Opportunities

- Difficult to quantify benefits / High visibility
- Limited level of participation / Good public relations
- Participation is voluntary
- Do not guarantee changes

VOC / NOx Total Emission Inventory

- Employer-based Program Mobile; Cars & Light trucks 6.37 / 4.31 tpd
- Area source Program Area 14.80 / 2.18 tpd

Estimated EI Reductions (tpd)

High/ Low

Employer-based Program	2% / 1%	0.10 / .06 tpd
Area source Program	2% / 1%	0.22 / .03 tpd

Implementation of Final Control Measures

Local officials of the City of Martinsburg and the Counties of Berkeley and Jefferson have enthusiastically embraced the recommendations of the Air Quality Task Force and officially adopted the final list of local control measures as their Early Action Plan. The local governments, as well the Economic Development Authorities from each county have come together in the spirit of cooperation to provide funding for implementation of the EAP. The participating entities have already pledged \$220,000 for continuing work on the Early Action Plan and its implementation. In addition, the official staff position of Air Quality Coordinator has been filled and charged with program implementation.

Ozone Action Days

The Ozone Action Days program was initiated on July 1, 2004 and will continue to be phased in throughout the upcoming calendar year. The program is two-pronged, targeting the general public as well as businesses and employees. Education and awareness will be the focus of program activities for the 2005 ozone season, with the ultimate goal being behavioral changes on a community level that result in reduced NOx and VOC emissions on Ozone Action Days.

Several educational tools will be used in this program. A web site, created as a component of the public awareness program, will contain a page devoted solely to information pertaining to Ozone Action Days and will include a subscription form whereby the general public may request to be notified by e-mail whenever Ozone Action Days are forecast for the Eastern Panhandle. Participation in the Ozone Action Days program will be measured, in part, by the number of subscribers to this mailing list. In addition, a general informational brochure on ground-level ozone and Ozone Action Days will be produced and distributed, in part, as a one-time insert in local newspapers in an effort to broadly educate the general public about the program. This brochure will also be made available in county and municipal government offices and will be a curriculum component for the school-based portion of the public awareness program.

Finally, employers throughout Berkeley and Jefferson Counties are being identified and divided among four sectors: Business, Government, Media and Schools. Each identified organization will automatically receive a notification containing emission reduction strategies specifically geared toward their respective sector on forecast Ozone Action

**Table 3
Eastern Panhandle of West Virginia (Berkeley-Jefferson Counties)
Final List of Emission Reduction Strategies**

Local Control Measures	Brief Description of Measures	Non-Modeled Estimate of Emissions Reduction (Tons/Day)	Proposed Date for Implementation	Local Government Implementation
<i>Primary Measures</i>				
Ozone Action Days Program	A two-pronged program aimed at reducing emissions on days when ozone levels are likely to be high. Program would be geared toward both the general public and employers.	0.09 NOx 0.32 VOC	7/1/2004	Berkeley County Jefferson County
Public Awareness Program	Another two-pronged program focusing on increasing the public's understanding of air quality issues in the region and increasing support for actions to improve the air quality	0.88 NOx 0.72 VOC	7/1/2004	Berkeley County Jefferson County City of Martinsburg
Bicycle and Pedestrian Measures	A series of measures designed to promote bicycling and walking including both promotional activities and enhancing the environment for these activities.	0.12 NOx 0.20 VOC	9/1/2005	Berkeley County Jefferson County City of Martinsburg
Reduce Engine Idling	Voluntary program to restrict heavy duty diesel engine idling times for both truck and school buses.	0.17 NOx 0.01 VOC	7/1/2005	Berkeley County Jefferson County City of Martinsburg
Voluntary Partnership with Ground Freight Industry	A voluntary program using incentives to encourage the ground freight industry to reduce emissions.	0.84 NOx 0.07 VOC	7/1/2005	Berkeley County Jefferson County
Increase Compliance with Open Burning Restrictions	Increase public awareness of the existing open burning restrictions and work with communities to increase compliance.	0.0005 NOx 0.0054 VOC	7/1/2004	Berkeley County Jefferson County
School Bus Engine Retrofit	Have existing school bus engines retrofitted to lower emissions.	0.02 NOx 0.001 VOC	7/1/2004	Berkeley County Jefferson County City of Martinsburg

Days. It is also the goal of the Air Quality Coordinator and Task Force members to identify regional Park & Rides, commuter programs and other commuting alternatives in the area. These alternatives will then be promoted to the management and employees of area industries, with an emphasis being placed on their significance in aiding in the reduction of emissions on Ozone Action Days. Several local business stakeholders on the Air Quality Task Force had positive feedback for both of these strategies and have offered their cooperation in promoting them throughout their own organizations. Companies participating in the Ozone Action Days program will be quantified and surveyed as to how many employees took advantage of commuting alternatives on Ozone Action Days and in general.

Partnerships with the media and other state agencies will be instrumental in forecasting and communicating Ozone Action Days to the target audiences. The City of Martinsburg and Counties of Berkley and Jefferson will work with the Maryland and/or Virginia Departments of Environmental Protection to predict and forecast Ozone Action Days one to three days ahead of time. City and county officials will then incorporate various local media, including radio, newspaper and television, to alert the public of forecast Ozone Action Days in a timely manner. The potential also exists for a partnership between the local city and county governments and the West Virginia Department of Transportation to utilize variable message signs along the I-81 corridor in alerting motorists of Ozone Action Days.

Administrative coordination of the Ozone Action Days program will commence in December 2004 in preparation for the 2005 ozone season. Implementation of the web site will occur in April 2005, with the brochure insert being distributed in early May in conjunction with the beginning of the 2005 season. The promotion of alternative commuting options will be organized and coordinated with area industries beginning in April 2004 and last throughout the 2005 ozone season.

Public Awareness Program

The public awareness program began concurrently with the Ozone Action Days program; however, its focus is broader than Ozone Action Days, and includes information on the health impacts of air pollution and how changes in everyday behaviors can positively impact the air we breathe. It is also a two-pronged program, targeting the general public as well as students, and like Ozone Action Days, education and awareness are its cornerstones. Also like Ozone Action Days, the public awareness program will be expanded incrementally throughout 2005.

The foundation of the public awareness program as it relates to the general public will be a broad-based, informational web site focusing on issues pertaining to air quality and ground-level ozone in the Eastern Panhandle of West Virginia. Other endeavors such as a logo and identity for the overall air quality program, the aforementioned Ozone Action

Days brochure, and curriculum materials for students will round out marketing initiatives for the public awareness program. These initiatives, excluding curriculum materials which will continue to be developed throughout the summer, will be designed, produced, and ready for implementation within the air quality program by April 2005, in time for the commencement of the 2005 ozone season in May. Public service announcements in local newspapers will be used in marketing the air quality program as well. Finally, the Air Quality Coordinator and Task Force members will leverage local health organizations such as hospitals, health clubs and non-profit agencies to help promote the air quality program and its message through public speaking opportunities and sponsorships of related events.

The school-based portion of the public awareness program will target elementary and possibly middle school students; the targeted student demographic will depend largely on standard science curriculum mandated by the State Department of Education and how it relates to air quality for each individual grade. The program curriculum will include dynamic, interactive information and activities designed to encourage students to modify their everyday behavior, as well as that of their peers and family, to positively impact air quality. The student program will be largely incentive-based and include specific behavioral changes students and their parents may pledge to incorporate into their daily lives, along with prizes awarded to students who take that pledge. Participation in the school-based portion of the program will be measured by the number of student pledges returned upon completion of the classroom presentation.

Between January and August 2005, the Air Quality Coordinator, along with Task Force officials, will work with local educational resources to develop curriculum materials for the targeted student demographic. This time will also be spent leveraging private schools and the Boards of Education for the City of Martinsburg and Counties of Berkeley and Jefferson for cooperation in implementing the student program in their schools. The school-based portion of the public awareness program will be fully implemented by fall 2005.

Bicycle and Pedestrian Measures

Early activities for this measure will include the promotion of bicycling and walking as an alternative means of transportation, particularly on Ozone Action Days. This promotion will take place in the form of an event, tentatively titled “Hike It or Bike It,” to be held one day per month throughout the 2005 ozone season. On these designated days, members of the EAC community will be discouraged from using their cars as a primary mode of transportation, including to their places of work if their commute allows. Local media will be notified of this monthly event and encouraged to promote it as part of their ongoing partnership with the Air Quality Task Force. Participation in this program will be quantified by random sampling on designated event days.

An additional portion of this measure has been implemented in the review of each county's comprehensive plan to identify projects that support bicycling and walking. To this date, several have been identified, most notably the pedestrian/bike paths running parallel to Route 45 into Shepherdstown, WV (Jefferson County) and the Shepherdstown Connector bypass, both of which were completed in 2002. In addition, a pedestrian/bike path will accompany the Route 9 highway expansion, currently under construction, from Charles Town, WV (Jefferson County) to Martinsburg, WV (Berkeley County). This project is expected to reach completion in 2007.

Several community developments are being planned in Berkeley and Jefferson Counties, many of which require developers to designate a percentage of open space as usable/recreational. As a result, many of these communities contain pedestrian/bike paths. Also common among these developments are recreational facilities, such as health clubs, and commercial components conveniently located within walking or biking distance of the residential community. Combined with the pedestrian/bike paths, these amenities encourage travel without the need for a motor vehicle.

Reduced Engine Idling

This measure will target the management of truck stops, travel plazas and rest facilities along the I-81 corridor within West Virginia in a bid to partner with them to educate their patrons on the economic and environmental advantages of reduced engine idling. Educational signage will be strategically displayed at participating facilities with the goal of encouraging voluntary reduction in idling behavior among patrons. Cooperating organizations will be publicly recognized and quantified for program participation purposes, and random sampling may be used to measure changes in idling habits. These facilities will also be encouraged to participate in EPA's SmartWay Transport Partnership in developing a nationwide network of idle-reduction options along major transportation corridors. In addition, Air Quality Task Force officials responded favorably to the idea of soliciting voluntary funding from area stakeholders for the purpose of partnering with suppliers of idle control technologies in an effort to provide these facilities with advanced electrification capabilities. Any future funding secured for this voluntary measure would be quantified and reported to EPA in future progress reports. A public service announcement specifically pertaining to reduced engine idling may also be produced. This PSA would be broadcast on local radio stations that statistically reach the highest number of drivers in an effort to directly target this largely transient demographic as well.

Finally, the Air Quality Task Force will work with city and county officials in an ongoing effort to establish local anti-idling ordinances in the City of Martinsburg and Counties of Berkeley and Jefferson. Any established regulations would attempt to be coordinated, if at all possible, with other EAC areas along the I-81 corridor in an effort to maintain uniform limits. The reduced engine idling program will be implemented by July 2005.

Ground Freight Partnership

This program will target and educate carriers and shippers in the Eastern Panhandle's motor freight industry on the environmental and economic merits of reduced engine idling, improved freight logistics, and preventative maintenance on company vehicles. Fleet managers will be interviewed on their current policies regarding emission reduction strategies. Organizations with such policies already in place will be recognized as a partner in the Early Action Plan's Ground Freight Partnership and encouraged to join EPA's SmartWay Transport Partnership, if they are not already a member. If no such policies exist at a targeted organization, pending the fleet managers' willingness and cooperation, that organization's capabilities for any or all of the following emission reduction strategies will be determined:

- Idle control technologies
- Improved scheduling policies to reduce wait (i.e. idle) time
- Regular preventative maintenance on fleet vehicles
- Driver Training Programs
- Driver Comfort Stations
- Load Matching
- Company-wide anti-idling policies

If, upon completion of this review, an organization chooses to adopt one or more of these strategies, they will be recognized as a partner in the Early Action Plan's Ground Freight Partnership and introduced to EPA's SmartWay Transport Partnership to consider participation in it as well. Success of the Ground Freight Partnership will be determined by the number of cooperating organizations, as well as the number of organizations that adopt emission reduction strategies where there previously were none. In addition, all members of EPA's SmartWay Transport Program in the Counties of Berkeley and Jefferson will be publicly recognized. This measure will not be implemented until July 2005, allowing time for discussions and negotiations with the members of the ground freight industry with operations in the Eastern Panhandle area.

Increased Compliance with Open Burning Restrictions

Both counties have open burning restrictions in place; however, these restrictions have not yet received much public attention. A program to bring about a higher level of compliance with existing regulations will begin in early 2005, with the goal of impacting the 2005 ozone season. With the cooperation of the Counties of Berkeley and Jefferson, every building permit issued within these municipalities will include the West Virginia Department of Environmental Protection's educational flyer outlining existing open burning regulations. The counties will also work with local developers, construction companies and other entities impacted by these restrictions to educate them on the issue. This measure will be part of both the general public awareness campaign as well as specifically targeted Ozone Action Days.

School Bus Engine Retrofit

The school bus diesel engine retrofit project is one measure being undertaken to demonstrate to EPA that the EAC has involved the community in making efforts to obtain emissions reductions. The reduction of diesel particulate not only reduces exposure of children and bus drivers to this carcinogen, but also to fine Particulate Matter (PM) as well. By the soon-to-be final implementation of diesel engine retrofit measures in Jefferson and Berkeley Counties, three main objectives will be met: air quality in WV's Eastern Panhandle region will be improved; the school bus engine fleets will be cleaner without having to replace existing buses; and school children will be exposed to reduced amounts of diesel engine exhaust, a likely human carcinogen.

A reduction of diesel exhaust emissions is expected by the completion of the eligible school bus retrofits with Diesel Oxidation Catalysts (DOCs). A 50% reduction of hydrocarbons (HC), including volatile organic compounds or VOCs, a ground level ozone precursor, can be achieved by implementing diesel engine retrofit measures on school buses in Berkeley and Jefferson Counties. The reduction of diesel particulate not only reduces exposure of children and bus drivers to this carcinogen, but reduces exposure to carbon monoxide (CO) by 40% and PM fines by 20% as well (approximate specific pollutant emission reduction figures obtained from information provided by US EPA).

Diesel engines are very reliable and it is not uncommon for them to be in use for 20-30 years. Thus, retrofitting school bus fleets with DOCs will result in emissions reductions sooner than would otherwise occur through fleet turnover. DOCs were chosen as the method of diesel engine retrofit for Jefferson and Berkeley Counties due to ease of installation, relatively low cost, and ability to reduce not only diesel exhaust emissions, but VOCs and CO as well. Logistically, the fact that DOCs do not require Ultra Low Sulfur Diesel (ULSD) fuel makes them an attractive choice. Economically, since DOCs are less expensive than diesel PM filter traps (as well as requiring less maintenance than PM filter traps), more school buses can be retrofitted, thereby decreasing diesel PM, HC and CO emissions over a larger area.

For the purposes of this project, retrofit candidates chosen were buses in active service with 1997 or newer engines. These buses are currently 6 years old and are expected to have at least another 6 years in active service, followed by possible continued use as spares. The DOCs were solicited via a competitive bid process using only vendors on EPA's list of Verified Retrofit Technologies. The Donaldson Company submitted the lowest bid and was therefore awarded the contract to supply DOCs and associated hardware for both counties.

Both schools are on schedule for the retrofits. Per the Grant Agreements, all retrofits are to be installed by January 1, 2005. Out of 100 buses to be retrofitted between Berkeley

and Jefferson County Schools, 99 retrofits have been completed to date. The current status of the retrofits in each county is as follows:

Berkeley County Schools:

DOCs and hardware conversion kits have been received and retrofitted on all 66 buses identified for the program.

Jefferson County Schools:

33 buses have been retrofitted out of 34 scheduled (approx. 97%). One bus, Bus 32, is waiting for the correct DOC. The DOC vendor has been contacted to resolve this problem.

A Final Report is due to WVDEP within 30 days of project completion. Following that, annual record-keeping of buses retrofitted with DOCs must be submitted for the next 5 years on July 1st of each year. This annual report is to include the vehicle miles traveled by each retrofitted bus (annual odometer readings), and annual fuel usage data by vehicle. This report must also certify that all retrofitted buses remaining in the fleet have been maintained in general service and that the DOCs have been in good working order.

In addition to the retrofit emission reductions, the 2003 session of the West Virginia Legislature passed a bill requiring the state Board of Education to develop a policy regarding the idling of school buses. House Bill 2961 was passed by the Legislature on March 8, 2003, and was signed by Governor Wise on April 1, 2003. The West Virginia Department of Education's Office of Transportation has written an anti-idling policy for school buses in West Virginia. The latest draft of the West Virginia policy, based on anti-idling policies from Maine and Connecticut, states:

- In normal weather a school bus driver shall not idle the bus while waiting for or loading students.
- Windows on the bus are to be closed until the bus leaves the school zone.
- Buses will be allowed to idle when the temperature is 40 degrees Fahrenheit or colder,
 - when the driving windows need to be defrosted,
 - when the safety and comfort of the students is in question, or
 - when emergency dictates.
- School bus operators are prohibited from idling the buses for more than 10 minutes unless defrosting of windows is needed.

Further, Students, teachers, bus drivers, and parents now have the opportunity to be involved in the "Turn It Off" project to reduce the idling of vehicles at school. The project helps to create a healthier school environment and can be incorporated into the educational program. A tool kit of resources and ideas for the "Turn It Off" project helps introduce students to the concept of the greenhouse effect, its source, and potential



impacts. Students can identify ways in which they can conserve energy and reduce their individual, family, school, and community contributions to harmful pollution and global warming.

On-going Public and Stakeholder Involvement

The Eastern Panhandle Air Quality Task Force was instrumental in evaluating and selecting the final local emissions control measures for the Early Action Plan. Local officials believe that this group should continue to meet and also become involved with the implementation of the measures. The cornerstone of the Eastern Panhandle program is public education and awareness. Air Quality Task Force members represent a broad range of interests and perspectives in the region and as such they can play an important role in raising the general level of awareness and stimulate voluntary actions to improve air quality. The new Air Quality Coordinator will meet with the Task Force on a periodic basis, keeping them informed on progress implementing control measures and identifying opportunities for “hands-on” participation. Members of the Air Quality Task Force will also provide important feedback from community interests on the acceptance and success of control measures. (A current listing of Task Force Members is attached.)

Maintenance for Growth

One of the requirements for an Early Action Plan is that there be provision for potential growth of emissions in the future. The purpose of this requirement is to ensure that areas will remain in attainment for at least five years beyond December 31, 2007. Berkeley and Jefferson Counties are expected to attain the 8-hour standard in 2010, based upon modeling performed by EPA in support of the Clear Skies Act, without consideration of the additional reductions anticipated under the Clear Skies Act. The modeled fourth highest ozone value is 65 ppb for Berkeley and 67 ppb for Jefferson, both well below the de facto standard of 84 ppb. It is extremely unlikely that any growth experienced between 2010 and 2012 would be sufficient to endanger the maintenance of the standard, especially considering the margin of safety between the modeled values and the standard.

Given the time constraints of the EAC submittal schedule, it was not possible to perform local photochemical modeling for the 2012 maintenance horizon. Therefore, WV DEP followed an EPA approved alternative to estimate future emissions for comparison to the 2007 attainment year emissions. If the NO_x and VOCs emissions in 2012 are equal to or less than the 2007 totals, then it is likely that the area will continue attainment through the later date. Estimates were made for the following source categories:

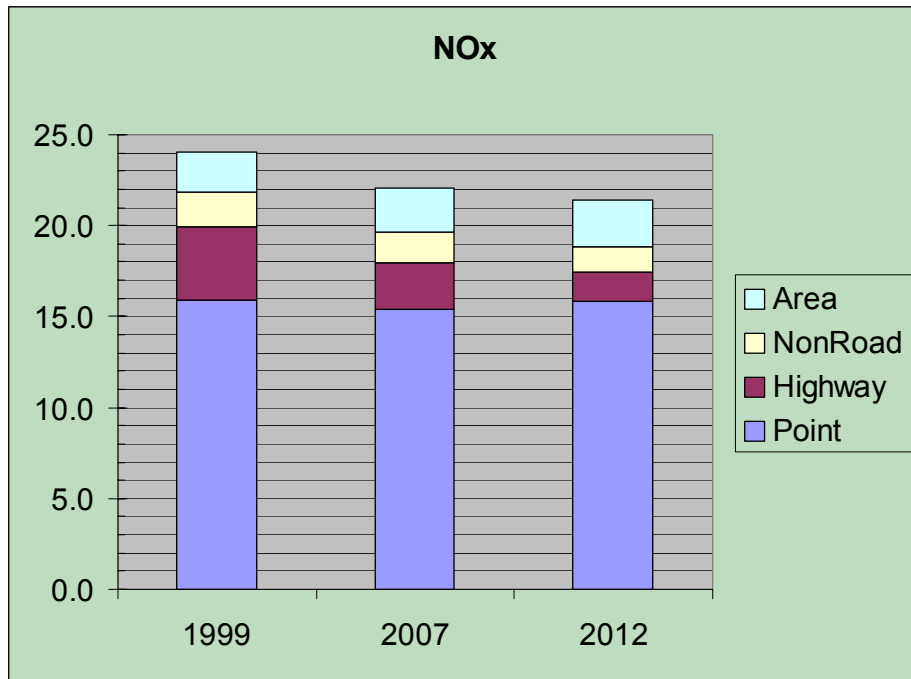
- Major point (stationary source):
1999 National Emission Inventory (NEI) plant totals were grown to 2007 and 2012 using EPA’s Economic Growth Analysis System (EGAS), with the Standard

Industrial Code (SIC) growth factors generated by the U.S. Bureau of Economic Analysis (BEA)

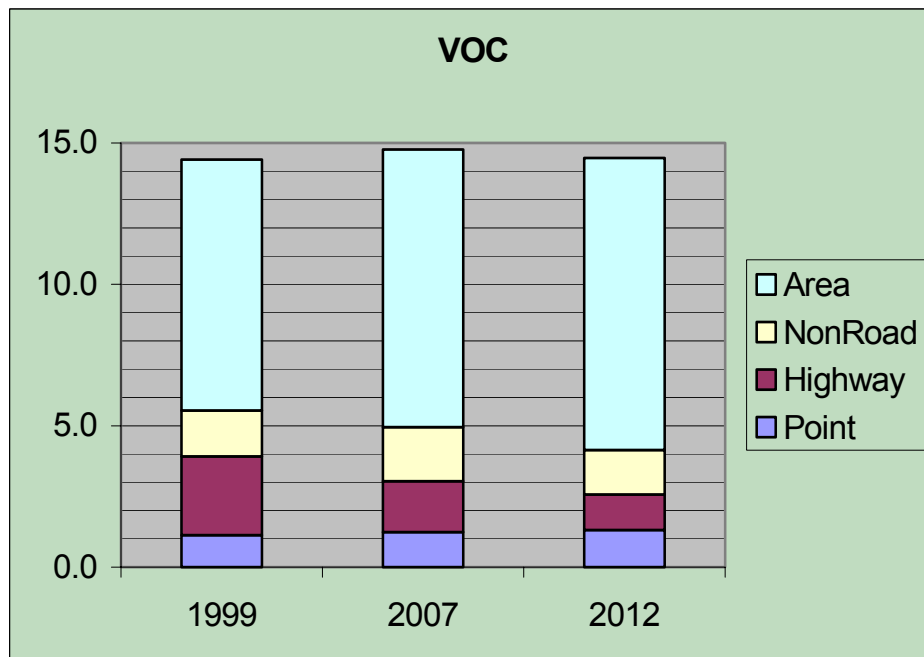
- **Highway (Cars & Trucks)**
 The WV DEP obtained highway vehicle miles travel estimates and projections from the WV DOT. Then, EPA’s MOBILE6.2 emissions factor model was used to generate locality specific emission factors to calculate total emissions for 1999, 2007 and 2012.
- **Non Road**
 EPA’s draft NOROAD 2004 Model was run for 1999, 2007 and 2012 to yield typical summer day emissions for Berkeley and Jefferson counties.
- **Area Sources**
 The WV DEP utilized the EPA’s 1999 (NEI) data as a base. Area source emissions are largely a function of population. Therefore, population growth was used to generate a surrogate growth factor for area sources. Population projections were obtained from the WVU Regional Research institute and interpolated to derive appropriate growth factors for 2007 and 2012. Emission inputs were adjusted from the 1999 NEI base to reflect a significant change in EPA’s methodology for residential wood combustion emission estimates.

Table 4
 Projected Ozone Precursor Emissions

NOx tons/day	1999	2007	2012
Point	15.9	15.4	15.8
Highway	4.0	2.5	1.6
NonRoad	2.0	1.7	1.4
Area	2.2	2.4	2.5
Total:	24.0	22.1	21.4
VOC tons/day	1999	2007	2012
Point	1.1	1.2	1.3
Highway	2.8	1.8	1.3
NonRoad	1.6	1.9	1.6
Area	8.9	9.8	10.3
Total:	14.4	14.8	14.5



The emission projections show that the total NOx emissions decrease from 22.1 tons per day (tpd) to 21.4 tpd from the attainment year of 2007 to the maintenance year of 2012. Additionally, the VOC emissions also decrease from 14.8 tpd to 14.5 tpd during the same period. Therefore, the emissions projection analysis indicates that the area should maintain its attainment status at least five years past its modeled attainment date of 2007.



The WV DEP will perform an annual evaluation, beginning in 2007 and ending in 2012, of the emissions inventory for Berkeley and Jefferson Counties to determine if growth may endanger the attainment/maintenance of the standard. If a significant threat exists, then the WVDEP will implement one or more of the contingency measures (Table 5).

Part of the annual review process will be coordination with VDEQ on periodic updates of planning assumptions and modeled data. Modeling updates by WV DEP and VDEQ will consider:

- All relevant actual new point sources;
- Impacts from potential new source growth; and
- Future transportation patterns and their impact on air quality in a manner that is consistent with the most current Long Range Transportation Plan and most current trend and projections of local motor vehicle emissions.

If review of growth indicates that adopted national, state and local control measures are going to be inadequate to maintain attainment in the future, additional measures will be considered for implementation. The Eastern Panhandle region has already given considerable thought to continuing maintenance of effort and has identified a series of contingency measures that will be evaluated for inclusion in the Early Action Plan, should the need arise.

Finally, in the event of a quality-assured, monitored violation after the attainment date of 2007, the WVDEP will implement one or more of the contingency measures within 18 months of the violation. Such measure(s) will remain in force at least throughout the five year maintenance period.

Conclusion

The Eastern Panhandle area of West Virginia has entered into an Early Action Compact that includes both Berkeley and Jefferson Counties. Accordingly, the area developed an ozone Early Action Plan (EAP) to attain the 8 hour ozone standard. The ozone levels have already decreased from the violation recorded in 2001-03. Monitoring data for the 2002-04 period shows that the area is now meeting the 8-hour standard, with a design value of 80 ppb. This improvement has largely occurred prior to the implementation of the EAP and may be attributed mainly to the NO_x SIP call. The area has fulfilled all EAC obligations to date, including adoption of local control measures that, in concert with existing federal measures, are sufficient to ensure attainment by 2007 as well as maintenance through 2012. The plan includes contingency measures that would be implemented in the event of a monitored violation. Therefore, as long as the area continues to meet its commitments and implements the EAP in a timely manner, its

nonattainment status should be deferred continuously. This deferral should be extended through the year 2007, at which time the area should be designed as attainment if the monitoring data then supports such a designation.

**Table 5
Contingency Measures**

Local Control Measures	Description of Measure	Non-Modeled Estimate of Emissions Reduction (Tons/Day)	Proposed Date for Implementation	Local Government Implementation
<i>Contingency Measures</i>				
WVDEP RACT (Reasonably Available Control Technology) and RACM (Reasonably Achievable Control Measures)*	Adoption of state requirements for control of volatile organic compounds (VOCs) in nonattainment areas.	1.29 VOC	Undetermined	Berkeley County Jefferson County
Alternative Fuels Program	Work with fleet owners to encourage use of alternative fuels.	Not Estimated	Undetermined	Berkeley County Jefferson County
Truck Stop Electrification	Develop a program to encourage the electrification of truck stops to discourage engine idling.	0.17 NOx 0.01 VOC	Undetermined	Berkeley County Jefferson County
Lower RVP Gasoline	Require sale of lower Reid Vapor pressure gasoline in the area.	0.94 VOC	Undetermined	Berkeley County Jefferson County