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To: The Honorable Robert F. McDonnell

Members of the General Assembly

From: David K. Paylor

Date: October 1, 2012

Subject: Report on Air Quality and Air Pollution Control Policies of the Commonwealth of Virginia

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In accordance with 10.1-1307.G of the *Code of Virginia*, the Department of Environmental Quality (DEQ), on behalf of the State Air Pollution Control Board, has completed its annual report on Air Quality and Air Pollution Control Policies of the Commonwealth of Virginia for 2012.

Overall Virginia's air quality continues to gradually improve and DEQ continues to take steps to improve air quality. Indeed, ambient concentrations of fine particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide in Virginia were meeting all of the national ambient air quality standards during calendar year 2011. However, the air quality standards that the Commonwealth must attain are becoming increasingly stringent. In 2010, the U.S. Environmental Protection Agency published lower National Ambient Air Quality Standards (NAAQS) for sulfur dioxide (SO_2) and for nitrogen dioxide (NO_2). Both of these standards require new implementation and monitoring strategies as well as more stringent numerical ambient air quality standards.

This report is being made available on DEQ's website at http://www.deq.virginia.gov/LawsRegulations/ReportstotheGeneralAssembly.aspx.

If you have any questions concerning this report or if you would like a hard copy of this report, please contact Angie Jenkins, Policy Director, at (804) 698-4268.

AIR QUALITY AND AIR POLLUTION CONTROL POLICIES OF THE COMMONWEALTH OF VIRGINIA

A Report to the Honorable Robert F. McDonnell, Governor and the General Assembly of Virginia

Virginia Department of Environmental Quality

October 2012

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Commonly Used Abbreviations

AQI	Air Quality Index
AQM	Office of Air Quality Monitoring
APA	Administrative Process Act
ASM	Acceleration Simulation Mode
BAC	Best Available Controls
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CASAC	Clean Air Scientists Advisory Committee
CH_4	Methane
CMS	Compliance Monitoring Strategy
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent Emissions
CPI	Consumer Price Index
CSAPR	Cross State Air Pollution Rule
CTG	Control Technique Guideline
DMV	Department of Motor Vehicles
DV	Deciviews, a metric of visibility
ECHO	Enforcement and Compliance History Online
EGU	Electric Generating Unit
ELRP	Emergency Load Response Program
EPA	Environmental Protection Agency
FCE	Full Compliance Evaluation
FOIA	Freedom of Information Act
FRM	Federal Reference Monitor
GHG	Greenhouse Gas
GVWR	Gross Vehicle Weight Rating
GWAQC	George Washington Air Quality Committee
HAP	Hazardous Air Pollutant
HPV	High Priority Violation
HRAQC	Hampton Roads Air Quality Committee
ICI	Industrial/commercial/institutional
I/M	Motor Vehicle Inspection and Maintenance Program
ISO	Independent Systems Operator
LAER	Lowest Achievable Emissions Rate
LPO	Lead Planning Organization
MACT	Maximum Achievable Control Technology
MANE-VU	Mid Atlantic/Northeast Visibility Union
MARAMA	Mid Atlantic Regional Air Management Association
MATS	Mercury and Air Toxics Standard
MOU	Memorandum of Understanding
MJO	Multi-jurisdictional planning organization
MMte	Million Metric Tons of CO_2 equivalent
MPO	Metropolitan Planning Organization
MSOS	Mobile Source Operations Section
MRAQC	Metropolitan Richmond Air Quality Committee
MW	Megawatt
MWAQC	Metropolitan Washington Air Quality Committee
NAAQS	National Ambient Air Quality Standard
NATA	National Air Toxic Assessments
NATTS	National Air Toxics Trend Site
NCore	National Core Monitoring Site
NH_3	Ammonia
NLEV	National Low Emission Vehicle Program
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NOIRA	Notice of Intended Regulatory Action
NOV	Notice of Violation
NOX	Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
OBD	On-Board Diagnostics
OCS	Outer Continental Shelf
ORE	On-Road Emissions Program
ORVR	On Board Refueling Vapor Recovery
OTC	Ozone Transport Commission
OTR	Ozone Transport Region
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter not more than 2.5 Angstroms in Diameter
PM_{10}	Particulate Matter no more than 10 Angstroms in Diameter
$PM_{10\text{-}2.5}$	Particulate matter with a diameter between 2.5 and 10 Angstroms
ppb	Parts per Billion
ppm	Parts per Million
PSD	Prevention of Significant Deterioration
QFF	Qualification Fumigation Facilities
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RAP	Regulatory Advisory Process
RBIS	Risk Based Inspection System
RFG	Reformulated Gasoline
RFP	Reasonable Further Progress
RIA	Regulatory Impact Analysis
ROP	Rate of Progress
RPO	Regional Planning Organization
SACC	Significant Ambient Air Concentrations
SAPCB	State Air Pollution Control Board
SBA	Small Business Assistance
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOP	State Operating Permit
SSI	Sewage Sludge Incinerator
STN	Speciated Trends Network
T&A	Timely and Appropriate
TPY	tons per year
TR	Transport Rule
UATM	Urban Air Toxics Monitoring network
ug/m^3	Micrograms per Cubic Meter
VDEQ	Virginia Department of Environmental Quality
VDH	Virginia Department of Health
VISTAS	Visibility Improvement State and Tribal Association of the Southeast
VOC	Volatile Organic Compounds
VPM	Virginia Productivity Measurements

1 Executive Summary

This report was prepared by the Virginia Department of Environmental Quality (VDEQ) on behalf of the State Air Pollution Control Board (SAPCB) for the Governor and General Assembly pursuant to § 10.1-1307 G of the Code of Virginia. This report details the status of Virginia's air quality, provides an overview of the air division programs, and briefly summarizes the federal and state air quality programs being implemented.

1.1 Air Quality in the Commonwealth

Air quality in Virginia continues to improve. Ambient concentrations of fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) in Virginia met EPA's National Ambient Air Quality Standards (NAAQS) in 2011. In 2010, the Environmental Protection Agency (EPA) published lower NAAQS for SO_2 and for NO_2. Both of these standards require new implementation and monitoring strategies as well as more stringent numerical ambient air quality standards. On April 30, 2012, the EPA Administrator notified VDEQ that all areas of the Commonwealth comply with the 2008 ozone NAAQS, with the exception of Northern Virginia. Northern Virginia was designated a marginal nonattainment area for this standard. On June 15, 2012, EPA proposed a new $PM_{2.5}$ standard, in the range of 12-13 $\mu g/m^3$. All areas of the Commonwealth are in compliance with this range. However, depending on the requirements in the final rule, Virginia's $PM_{2.5}$ monitoring network may need to be upgraded to meet new federal requirements.

1.2 Air Quality Policies in the Commonwealth

On August 21, 2012, the United States Court of Appeals for the D.C. Circuit vacated the Cross-State Air Pollution Rule (CSAPR) but continued to leave the Clean Air Interstate Rule (CAIR) in place pending EPA's promulgation of a replacement rule that complies with the courts' rulings. EPA is expected to finalize the reconsideration of the Industrial/Commercial/ Institutional (ICI) Boiler Maximum Achievable Control Technology (MACT) regulations by the end of 2012. These regulations will impact air quality policies in the Commonwealth.

1.3 Summary of Annual Air Division Activities

Monitoring Locations:	45	On Site Inspections :	1,431
Monitoring Instruments:	131	Enforcement Actions:	360
Minor Source Permits Issued:	199	Vehicles Inspected:	824,197
State Major Permits Issued:	1	Vehicles Failed:	39,056
General Permits Issued:	38	Inspection Station Audits:	505
State Operating Permits Issued:	13	Covert Audits:	175
Federal Operating Permits Issued:	34	Consent Orders Issued:	123
Fumigation Event Notifications	>650	Civil Charges Collected:	$1,327,668.61
Compliance Evaluations (all):	8,418		

2 Status of Air Quality in the Commonwealth of Virginia

Ambient concentrations of $PM_{2.5}$, CO, NO_2, and SO_2 in Virginia met EPA's NAAQS in 2011. Air quality in some regions of the Commonwealth during the summer of 2011 did not comply with the 2008 ozone NAAQS.

2.1 Monitoring Network

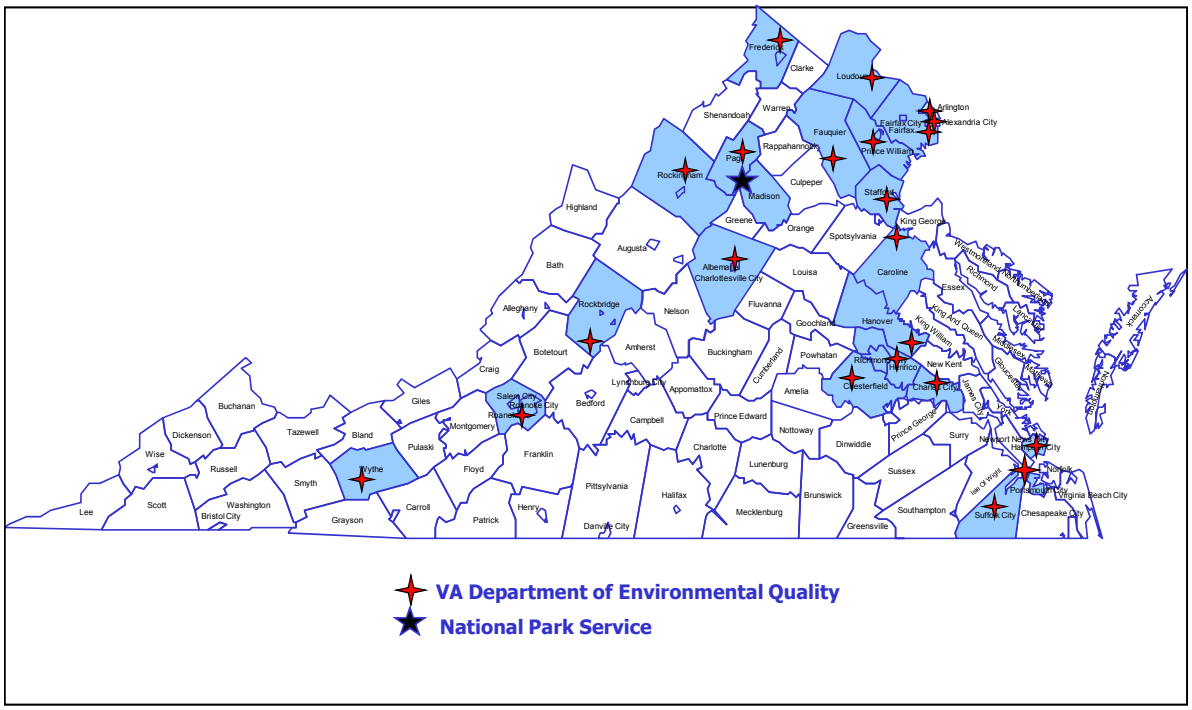

Figure 2-1: Virginia Ozone Monitoring Network

VDEQ's Office of Air Quality Monitoring (AQM) maintains an extensive air quality monitoring network throughout the Commonwealth. Ambient air quality was measured by approximately 131 instruments at 45 sites during 2011 - 2012. Figure 2-1 shows the various ozone monitoring sites in Virginia. All monitoring sites were established in accordance with EPA's siting criteria (40 CFR Part 58, Appendices D and E), and all sites conform to EPA guidance documents and generally accepted air quality monitoring practices. Data reported from the Virginia air quality monitoring network were quality assured in accordance with federal requirements (40 CFR Part 58, Appendix A). The data are published annually in the *Virginia Ambient Air Monitoring Data Report* and are available from the VDEQ website at http://www.deq.virginia.gov/Programs/Air/AirMonitoring/Publications.aspx.

2.1.1 Community Air Monitoring Study (Suffolk)

Pursuant to HB 1625 (2011), VDEQ has begun an air monitoring study at fumigation sites to provide data to the Virginia Department of Health for its assessment of health impacts. VDEQ is forming a stakeholder group to help communicate the results of the study to the public. The study was designed in cooperation with the Department of Health, and the Department of Agriculture and Consumer Services is assisting with the stakeholder process. The air monitoring study is expected to be completed in time to report data to the Virginia Department of Health by July 1, 2013. See Section 3.2.5 for more information on the permitting of fumigation facilities.

2.1.2 Near Road Monitoring for NO_2

In February 2010 EPA promulgated a new ambient air quality standard for NO_2. This standard included a new requirement for the installation and operation of monitoring stations that meet the definition of a "near road" monitoring site. No existing stations meet this definition, and therefore up to three new monitoring stations must be installed by the regulatory deadline of January 1, 2013. These new stations are a federal mandate for which EPA is providing start-up funds but is not at this time providing operating funds.

2.2 Data Trends for $PM_{2.5}$ and Ozone

For $PM_{2.5}$, the annual average trend across the Commonwealth shows marked improvement in air quality. Figure 2-2 provides annual $PM_{2.5}$ averages for monitors in the Richmond-Petersburg area. Other areas of the Commonwealth follow a similar trend.

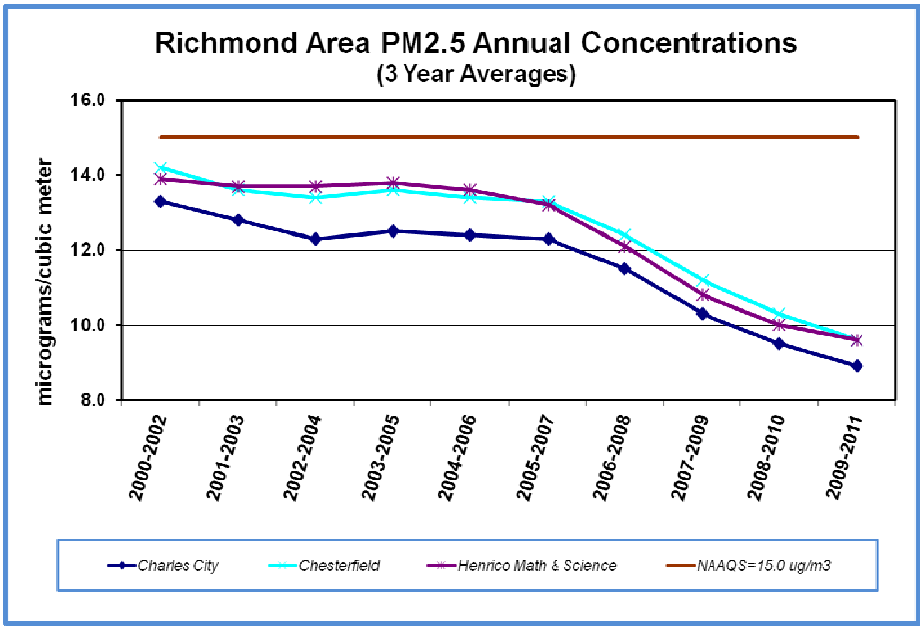

Figure 2-2: Richmond Area $PM_{2.5}$ Air Quality, Annual Basis

For the 24-hour $PM_{2.5}$ data, the monitors across the Commonwealth have registered a pattern of decreasing values, and all monitors are in compliance with the 35 $\mu g/m^3$ standard. Figure 2-3 provides data for Northern Virginia air quality $PM_{2.5}$ monitors and shows the values on a 24-hour basis. As denoted by the red line in Figure 2-3, all monitors in Northern Virginia are showing levels below the 2006 NAAQS for $PM_{2.5}$, indicating good air quality for $PM_{2.5}$. Other areas of the Commonwealth follow a similar trend.

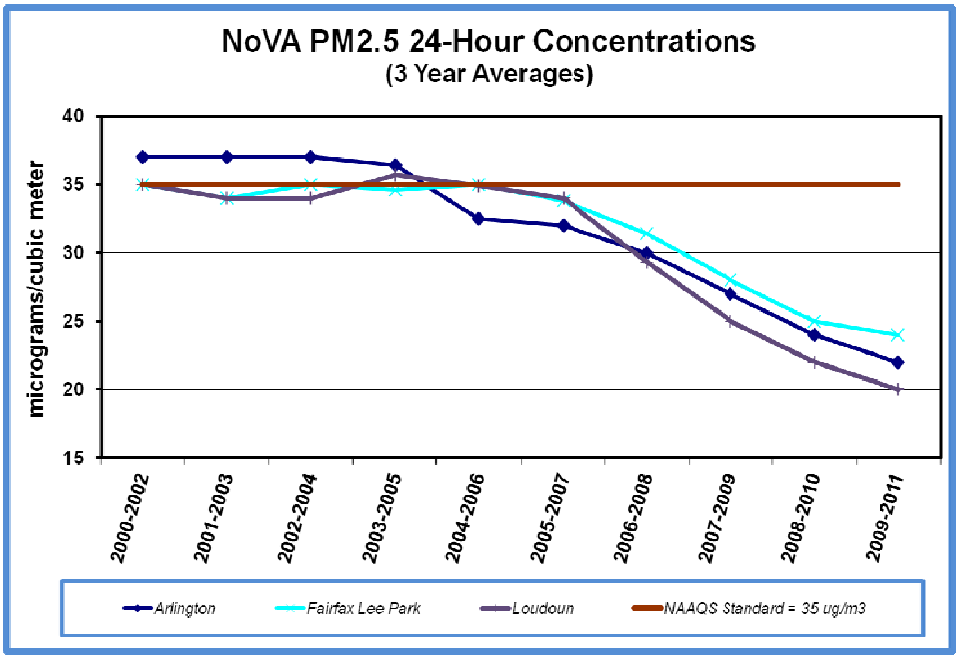

Figure 2-3: Northern Virginia 24-Hour $PM_{2.5}$ Air Quality

Like $PM_{2.5}$, ozone trends continue to show improvement in air quality. In 2008, EPA finalized an ozone standard of 0.075 parts per million (ppm) or 75 parts per billion (ppb). Table 2-1 shows the monitoring data for the 2009 through 2011 ozone seasons for each of the monitors in Virginia. More information regarding this ozone standard may be found in Section 3.1.2.

Table 2-1: Ozone Air Quality Values for All Virginia Monitors, 2009-2011 Data

Monitor Jurisdiction	*Value, ppb*	*Monitor Jurisdiction*	*Value, ppb*	*Monitor Jurisdiction*	*Value, ppb*
Loudoun	73	Shenandoah	71	Wythe	65
Prince William	69	Stafford	72	Rockbridge	63
Arlington	80	Caroline	70	Page	66
Alexandria	77	Frederick	66	Fauquier	64
Fairfax-Lee Park	82	Roanoke	68	Rockingham	66
Hanover	73	Chesterfield	72	Albemarle	67
Charles City	75	Henrico	74	Suffolk-TCC	71
				Suffolk-Holland	70

3 Air Pollution Control Overview

This overview is broadly categorized into planning, permitting, compliance, enforcement, and other initiatives. Descriptions of significant current policy issues under each category are provided.

3.1 Air Quality Planning Initiatives

Air quality planning strategies now focus on preparations for compliance with the 2010 NO_2 NAAQS, the 2010 SO_2 NAAQS, and the 2008 ozone NAAQS. However, other initiatives continue to require attention and resources. These initiatives include the development and submittal of various Clean Air Act (CAA) infrastructure requirements; the mid course review requirements of the Regional Haze program; the development of Ozone Advance action plans for Richmond-Petersburg, Fredericksburg, and Hampton Roads 1997 ozone NAAQS maintenance areas; and the development of a redesignation request and maintenance plan for the Northern Virginia 1997 $PM_{2.5}$ NAAQS nonattainment area.

3.1.1 Control Technique Guidelines

As required by §183(e) of the CAA, EPA conducted a study of volatile organic compound (VOC) emissions from the use of consumer and commercial products to assess their potential to contribute to levels of ozone that violate the NAAQS for ozone and to establish criteria for regulating VOC emissions from these products. Any regulations issued under §183(e) must be based on "best available controls" (BAC).

Section 183(e)(3)(C) provides that EPA may issue a control technique guideline (CTG) in lieu of a national regulation for a product category where EPA determines that the CTG will be substantially as effective as national regulations in reducing emissions of VOC in ozone nonattainment areas. A state with ozone nonattainment areas is required to evaluate the recommendations provided in the CTGs and determine if modification of existing regulations or creation of new regulations is needed to be consistent with the requirements of the CTG. A state with areas included in the Ozone Transport Region (OTR), like Northern Virginia, must apply the requirements in the OTR for all sources covered by the CTG. After VDEQ promulgates a regulation implementing the requirements of the CTG for a product or source category, VDEQ must submit the regulation to the EPA for approval as part of the State Implementation Plan (SIP) within one year from signature of the CTG. EPA has issued four groups of standards under §183(e) of the CAA:

- Group I: These standards apply to categories such as consumer products, architectural coatings, and auto body refinishing coatings. Unlike Groups II, III, and IV, these standards are national requirements and are codified in 40 CFR Part 59.
- Group II: Issued September 29, 2006, these CTGs regulate VOC emissions from flexible packaging printing operations, lithographic and letterpress printing materials, industrial cleaning solvents, and flat wood paneling coatings.

- Group III: Issued October 9, 2007, these CTGs regulate VOC emissions from paper, film, and foil coatings; metal furniture coatings; and large appliance coatings.
- Group IV: Issued July 14, 2008, these CTGs regulate VOC emissions from miscellaneous metal products coatings; plastic parts coatings; auto and light-duty truck assembly coatings; fiberglass boat manufacturing materials; and miscellaneous industrial adhesives.

VDEQ has surveyed the Northern Virginia area and submitted declarations to EPA for several of the CTG categories demonstrating that no potentially regulated facilities operate in the Northern Virginia area. However, the survey results indicate that, for some categories, potentially affected facilities may be operating in the Northern Virginia area and that regulations must be developed for offset lithographic printing and letterpress printing; industrial cleaning solvents; miscellaneous metal and plastic parts coatings; and miscellaneous industrial adhesives. These regulations are continuing through the Commonwealth's regulatory process.

3.1.2 2008 Ozone NAAQS

Ozone is a pollutant that is not generally emitted directly into the atmosphere. Rather, it is created through a photochemical reaction between VOC and oxides of nitrogen (NO_X) in the presence of sunlight. Ozone is the primary component of smog and is a lung irritant. Especially susceptible populations include elderly people, children, and those with lung ailments such as asthma and emphysema. Ozone also interferes with plants' abilities to process food and ward off diseases.

3.1.2.1 2008 Ozone NAAQS Background

On March 12, 2008, EPA revised both the primary and the secondary NAAQS for ozone to 0.075 ppm. However, on September 16, 2009, EPA announced that it was reconsidering the 2008 ozone standard, and on January 6, 2010, EPA proposed a new ozone standard of between 0.060 ppm and 0.070 ppm on an 8-hour average. EPA noted that the ozone standards set in 2008 were not as protective as recommended by EPA's panel of science advisors, the Clean Air Scientific Advisory Committee (CASAC). EPA stated that the proposed standards are consistent with CASAC's recommendations and place more weight on key scientific and technical information. On September 2, 2011, President Obama's Administration requested that EPA withdraw its proposed reconsideration of the 2008 standard, and on May 21, 2012, EPA published the final area designations and classifications for this standard. All areas of the Commonwealth, with the exception of Northern Virginia, were designated as attaining this standard. Northern Virginia was designated as nonattainment, with a classification of marginal. The next CAA-mandated review of the ozone NAAQS will be in 2013.

3.1.2.2 Ozone Advance Action Plans

On April 4, 2012, EPA announced the Ozone Advance program. This program is a collaborative effort between EPA, states, local governments, and other stakeholders to encourage expeditious emission reductions in ozone attainment areas so that the participating areas may continue to meet the 2008 ozone NAAQS. The goals of the program are:

- To help attainment areas take action in order to keep levels below the 2008 ozone NAAQS, ensuring continued health protection for citizens;
- To better position areas to remain in attainment; and
- To efficiently direct available resources toward actions that will expeditiously address ozone problems.

This program is voluntary. The resulting framework developed by the stakeholders in any participating area is not submitted to EPA as a SIP revision and is therefore not federally enforceable.

As noted in Table 2-1, several areas in the Commonwealth, including the Fredericksburg 1997 ozone NAAQS maintenance area, the Richmond-Petersburg 1997 ozone NAAQS maintenance area, and the Hampton Roads 1997 ozone NAAQS maintenance area, have data from 2009-2011 demonstrating compliance with the 2008 ozone NAAQS. This demonstration is based, as required by federal regulations, on the three-year average of the fourth highest 8-hour average recorded at any particular monitoring site. The data in Table 2-1 is from years 2009 through 2011. Ozone readings in 2009 were depressed somewhat due to the economic downturn and extremely favorable meteorology. Data from the summer of 2012 will take the place of the 2009 data, and averages for 2010 through 2012 may result in higher readings. Implementation of proactive measures to voluntarily reduce ozone formation is a prudent measure to help ensure continued compliance with the 2008 ozone NAAQS.

In cases where data may show that areas originally designated attainment for the 2008 ozone NAAQS violate the standard, EPA's guidance indicates that the EPA Administrator may use discretion in redesignating areas. When a violation occurs, the EPA Administrator may consider factors listed in §107(d)(3)(A) of the CAA, which include "air quality data, planning and control considerations, or any other air quality-related considerations the Administrator deems appropriate." EPA's Ozone Advance guidance indicates that where control measures are actively being implemented by program participants, EPA may allow time to determine whether such measures bring the area back into attainment.

Final drafts of the Ozone Advance action plans for these areas are expected to be ready for public review by January of 2013.

3.1.2.3 2008 Ozone NAAQS Implementation Rule and Transportation Conformity

On May 21, 2012, EPA published in the *Federal Register* a final rule for the implementation of the 2008 ozone NAAQS. This rule provides for the revocation of the 1997 ozone NAAQS for transportation conformity purposes to occur on July 20, 2013. For areas that were designated attainment for the 2008 ozone NAAQS but operate under a maintenance plan for the 1997 ozone NAAQS, this rule removes the transportation conformity requirements within those areas, allowing both the Department of Transportation and the metropolitan planning organizations (MPOs) to devote those resources to other concerns. Unless areas get redesignated as nonattainment for the 2008 ozone NAAQS due to poor air quality, this rule will remove requirements for transportation conformity in the Fredericksburg 1997 ozone NAAQS

maintenance area, the Richmond-Petersburg 1997 ozone NAAQS maintenance area, and the Hampton Roads 1997 ozone NAAQS maintenance area.

3.1.3 1997 Ozone NAAQS Maintenance Areas

Improvements in air quality allowed the following areas to demonstrate compliance with the 1997 ozone NAAQS after these areas were originally designated as nonattainment: Richmond-Petersburg, Fredericksburg, the Shenandoah National Park, and Hampton Roads. When an area is redesignated from nonattainment to attainment, Virginia must prepare a SIP that meets the requirements for 8-hour ozone maintenance areas and that demonstrates how good air quality will be maintained into the future. Using EPA guidance, the Commonwealth submitted redesignation requests, inventories, and maintenance plans for these areas to EPA, which were approved after review and public comment.

During the 2007 and 2008 ozone seasons, ozone violations of the 1997 ozone NAAQS were registered at a monitor in Henrico County, part of the Richmond-Petersburg maintenance area. The maintenance plan for the area includes contingency measures to be implemented in such an event. A regulatory action was initiated in order to implement control strategies specified in the contingency measures for the Richmond-Petersburg area. These contingency measures include control strategies for mobile equipment repair and refinishing, architectural and industrial maintenance coatings, consumer products, and portable fuel containers. As a proactive measure towards meeting the new ozone NAAQS in this area, the SAPCB also directed VDEQ to take comment on the implementation of an additional regulation, the adhesives and sealants regulation. These regulations are continuing through the Commonwealth's regulatory process.

3.1.4 2006 $PM_{2.5}$ NAAQS

On September 22, 2006, EPA promulgated a revised $PM_{2.5}$ NAAQS. The 2006 standard revised the daily $PM_{2.5}$ standard from 65 ug/m^3 to 35 ug/m^3 and retained the $PM_{2.5}$ annual standard of 15.0 ug/m^3. On October 8, 2009, EPA published the final designations for the 2006 daily $PM_{2.5}$ standard in the *Federal Register*, and all areas of the Commonwealth were designated as attainment or unclassifiable.

3.1.5 2010 NO_2 NAAQS

NO_2 is a gaseous air pollutant that forms when fossil fuels such as coal, oil, gasoline, or diesel are burned at high temperatures. NO_2 contributes to the formation of particle pollution by converting in the atmosphere to nitrate aerosols, a component of $PM_{2.5}$. NO_2 also is a building block of ozone.

On January 22, 2010, EPA finalized a new primary NO_2 NAAQS and set the standard at 100 ppb over a one-hour average, which is significantly more stringent than the previous primary standard of 53 ppb on an annual average. In this standard EPA also established new monitoring and reporting requirements that will require the location of NO_2 monitors near major road ways. EPA noted that NO_2 concentrations near major roads are expected to be appreciably higher than

the levels measured in the current network. VDEQ is working towards modifying the existing monitoring network to meet the requirements of the NO_2 NAAQS, including the installation of a near-road monitor. VDEQ expects that at least one roadside monitoring site will be required for Virginia, and the location of this first monitoring site is tentatively planned for the I-95/I-395 interchange in Fairfax County.

On February 17, 2012, EPA classified all areas of the Commonwealth as attainment/unclassifiable for this standard. Once near-road NO_2 data is available, additional recommendations may be made.

3.1.6 2010 SO_2 NAAQS

SO_2 is one of a group of highly reactive compounds known as "oxides of sulfur." The largest sources of SO_2 emissions are fossil fuel combustion at power plants and other industrial facilities. Smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore and the burning of sulfur-laden fuels by locomotives, large ships, and non-road equipment. Emissions of SO_2 also contribute to the formation of particle pollution by converting in the atmosphere to sulfate aerosols, a major component of $PM_{2.5}$.

3.1.6.1 2010 SO_2 NAAQS Background

On June 2, 2010, EPA finalized a new primary NAAQS for SO_2. This regulation significantly strengthened the short term requirements by lowering the standard to 75 ppb on a one-hour basis. The new federal regulation revokes the previous primary standards of 140 ppb over a 24-hour period and 30 ppb over an annual period. Virginia has experienced reductions in SO_2 emissions from a variety of federal programs such as regulations on the interstate transport of SO_2 by power plants and the requirements for greatly reduced sulfur content in on-road and off-road fuels.

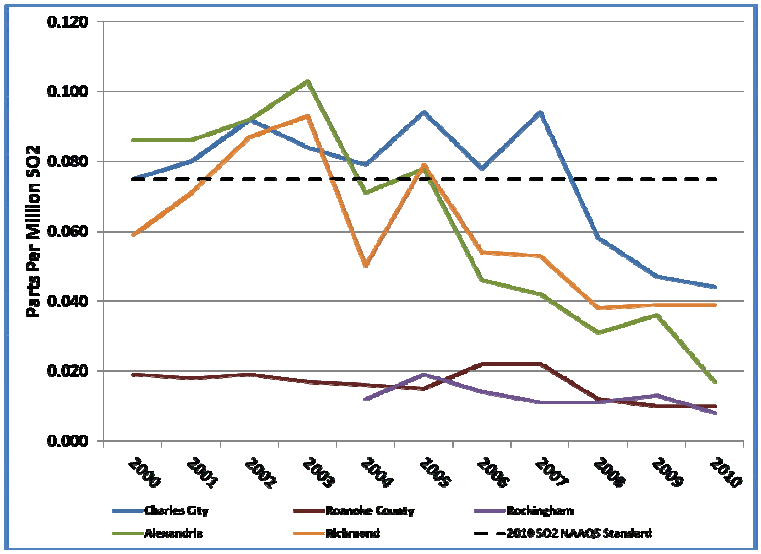

Figure 3-1: 1-Hour SO_2 Air Quality Trends 2000-2010 (99th Percentile, Yearly)

Monitoring data from the state's monitoring network show compliance with this standard, as demonstrated by Figure 3-1. Based on this air quality monitoring data, federal guidance, and the lack of source-specific modeling results, VDEQ made recommendations to the EPA Administrator on June 2, 2011, that all areas in Virginia be classified as "unclassifiable" for this standard.

3.1.6.2 2010 SO_2 NAAQS Implementation Rule

EPA released its proposed implementation guidance for the 2010 SO_2 NAAQS on October 3, 2011. VDEQ submitted extensive comments to EPA on November 16, 2011, recommending many changes to the implementation process to make the process workable and less resource intensive. After reviewing these comments as well as many others submitted by a variety of stakeholders, EPA agreed to revisit the proposed guidance. In a letter dated April 12, 2012, from EPA to VDEQ, EPA outlined a three-step plan:

- EPA intends to move forward with its area designations as quickly as possible, likely based on monitoring data only. All monitors in Virginia are currently meeting the one-hour SO_2 NAAQS; therefore, VDEQ does not expect any SO_2 nonattainment area designations.
- EPA initiated stakeholder workgroups to examine the approach for determining NAAQS compliance. VDEQ participated in these workgroups on May 31, 2012.
- EPA eliminated the requirement for states to provide air quality modeling as part of the June 2013 SIP submittal.

3.1.7 Proposed $PM_{2.5}$ NAAQS

On June 14, 2012, EPA proposed a new rule strengthening the NAAQS for $PM_{2.5}$ and retaining the existing standard for coarse particle pollution (PM_{10}). The proposal changes the annual standard for $PM_{2.5}$ from 15.0 $\mu g/m^3$ to a level within the range of 12-13 $\mu g/m^3$. The proposal suggests retaining the existing 24-hour $PM_{2.5}$ standard, set at 35 $\mu g/m^3$ in 2006, and setting a separate $PM_{2.5}$ standard to improve visibility, primarily in urban areas. EPA has proposed two options for this visibility standard, 30 deciviews or 28 deciviews, both measured on a 24-hour standard. Deciviews are units of visibility, and the value of the deciview measurement increases as visibility worsens.

Current monitoring data demonstrates that Virginia is in compliance with these proposed standards although visibility data from urban areas is limited. Depending on the requirements of the final rule, the monitoring network may need to be updated to include urban visibility monitors.

3.1.8 Regional Haze

Section 169 A of the CAA mandates the protection of visibility in national parks, forests, and wilderness areas, referred to as Class I federal areas. Visibility impairment or haze is caused by absorption and scattering of light by fine particles. Sources and activities that emit fine particles and their precursors, such as NO_X, SO_2, VOC, and ammonia (NH_3), contribute to this

problem. In 1999, EPA finalized the Regional Haze Rule, calling for state, tribal, and federal agencies to work together to improve visibility in 156 national parks and wilderness areas.

Virginia developed a SIP to address visibility impairment in the Commonwealth's two Class I areas, the Shenandoah National Park and the James River Face Wilderness Area. This plan established goals and emission reduction strategies to reduce visibility impairment such that the visibility in the Shenandoah National Park and the James River Face Wilderness Area will be returned to natural conditions by 2064. With the help of the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) multi-jurisdictional planning organization (MJO), the SIP was finalized on October 4, 2010. The submittal addressed reasonable progress requirements of the CAA, long term strategies, and Best Available Retrofit Technology (BART) requirements for certain industrial facilities. EPA published a limited approval of this SIP revision on June 13, 2012.

VDEQ is currently working on the development of a mid-course review, as required by federal regulations, for analyzing progress toward the visibility goals in the SIP submittal. The mid-course review is expected to be ready for submittal to EPA in early 2013.

3.1.9 Stage II Gasoline Vapor Recovery Systems

On May 16, 2012, the EPA Administrator published in the *Federal Register* a notice of final rulemaking determining that onboard refueling vapor recovery (ORVR) systems are in widespread use throughout the motor vehicle fleet. That notice waived the statutory requirement that serious, severe, and extreme ozone nonattainment areas adopt and implement programs requiring Stage II vapor recovery systems on gasoline dispensing facilities. Virginia has previously adopted Stage II requirements in the Richmond-Petersburg and Northern Virginia areas. The notice also states that EPA guidance describing appropriate methods for removing these requirements from SIPs is forthcoming. Upon issuance of this guidance, VDEQ will evaluate the methodology and determine the best course of action for this source sector.

3.1.10 Sewage Sludge Incinerators

On March 21, 2011, EPA finalized standards of performance for sewage sludge incinerator (SSI) units. This rulemaking created a new source performance standard (NSPS) for new units and emission guidelines for existing units. This final action sets limits for nine pollutants under §129 of the CAA: cadmium, CO, hydrogen chloride, lead, mercury, NO_X, particulate matter, polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans, and SO_2. The SAPCB adopted the NSPS by reference in December 2011 and a new regulation (Rule 4-55) for existing sources covered by the emissions guidelines in June 2012. The facilities subject to Rule 4-55 are the Noman M. Cole Wastewater Treatment Plant, the Harrisonburg Resource Recovery Facility, HL Mooney Wastewater Treatment Facility, Blacksburg VPI Sanitation Authority, Hopewell Wastewater Treatment Plant, and five Hampton Roads Sanitation District facilities. The final compliance date for the facilities is March 21, 2016.

3.2 Air Permitting

VDEQ issues two basic types of air permits: construction permits and operating permits. Construction permits, termed New Source Review (NSR) permits, apply to new facilities as well as existing facilities that are undergoing an expansion or modification. Operating permits apply to sources that are already in operation.

VDEQ has three construction permit programs for criteria pollutants. The Prevention of Significant Deterioration major new source review (PSD) program applies to major sources that are located in an area that is in attainment with the NAAQS. Sources are required to apply Best Available Control Technology (BACT) as well as undergo a thorough air quality analysis demonstration (i.e. air modeling) to assure the new facility or major modification will not cause or contribute to a violation of the NAAQS or have an adverse impact on any Class I area. The second program is the non-attainment major NSR program that applies to major sources located in an area that is not in compliance with one or more NAAQS. A facility in a non-attainment area must apply the Lowest Achievable Emission Rate (LAER), which is often more rigorous than BACT, and must obtain offsets for the pollutant for which the area is not in attainment. The third program is the minor NSR program. This program applies to new sources or existing sources that are undergoing a modification and that are below major source emissions thresholds. During the 2012 fiscal year, 199 minor NSR permits were issued. Additionally, the minor NSR program is used to issue state major source permits, which apply to those sources that have emissions greater than 100 tons per year (tpy) of a criteria pollutant but that do not fit the criteria to be classified as PSD or nonattainment major NSR. One state major permit was issued in Virginia in fiscal year 2012. Virginia also has general permits (or permits by regulation) for non-metallic mineral processors and distributed generation. If a facility meets the necessary requirements, the facility may use the general permit process instead of the normal minor NSR permitting process. Thirty-eight general permits were issued in Virginia during fiscal year 2012.

VDEQ issues two types of operating permits: state operating permits (SOPs) and federal operating permits that include Title V permits. SOPs are used primarily to cap a source's emissions to keep it below major source emissions thresholds and out of a major source permitting program. SOPs are often used to place federally and state enforceable limits on hazardous air pollutants (HAPs) to keep a source out of the federal HAP program. The federal HAP program generally requires the implementation of MACT standards. A source may request a SOP at any time, and the SAPCB may issue a SOP as necessary (due to a modeled or actual exceedance of a NAAQS or to meet a CAA requirement). Thirteen SOPs were issued during fiscal year 2012.

The Title V permit program applies to sources that meet the criteria for being "major" under Title V of the CAA. The purpose of a Title V permit is to compile all requirements from a source's multiple air permits into one permit document. A newly constructed source that is large enough to qualify as a Title V source must apply for a Title V permit within one year of starting operation. Title V permits must be renewed every five years.

Acid Rain permits also are considered federal operating permits. These permits are issued to sources that are subject to the federal Acid Rain program (CAA Title IV). Three federal operating permits and 31 operating permit renewals were issued during fiscal year 2012.

3.2.1 Revision of Minor NSR Regulation

In fiscal year 2011, the SAPCB took final action on the amendments to the minor NSR regulation. The amended rule makes clarifications and incorporates the most recent federal and state policies and guidance into the minor NSR program. The final rule is continuing through the Commonwealth's regulatory review process.

3.2.2 Completion of General Permits

Pursuant to legislation adopted during the 2009 General Assembly Session, the SAPCB was directed to develop two new general permits. One general permit is for specific sources that generate electricity during emergencies, including Independent Systems Operator (ISO) declared emergencies. This general permit applies to sources above the minor source permitting exemption levels but below the major source permitting exemption levels. The second general permit applies to generators that are used for load curtailment, demand response, or peak shaving. Sources have the option of getting a general permit or a minor NSR permit. Both of these general permits went into effect in August 2012. Two general permits for emergency generators were issued in fiscal year 2012.

3.2.3 Greenhouse Gas Permitting

On January 2, 2011, greenhouse gases (GHGs) became pollutants that must be considered during the major source air permitting process. On May 13, 2011, EPA approved Virginia's program for GHGs. As a result of this approval, VDEQ, not EPA, became the official permitting authority for major sources emitting GHGs. A facility is only required to address their GHG emissions if they emit more than 100,000 tpy of carbon dioxide equivalent pollution (CO_2e) or modify their operations such that there is at least a 75,000 tpy increase in CO_2e. Minor sources of air pollution are excluded from the GHG requirements. Additionally, on March 21, 2011, EPA published a deferral for sources that emit CO_2 from biomass processes such as wood combustion. The deferral is in effect until July 21, 2014. The EPA deferral was adopted into the Virginia regulations by the SAPCB and went into effect on November 9, 2011. Sources that would have been major only because of their CO_2 emissions from biomass will not have to go through the major NSR permitting process until the deferral expiration. The deferral applies only to CO_2 emissions and does not apply to other GHGs. During fiscal year 2012, there were no major source GHG permits issued. It is anticipated that the first major source permit with GHG limits will be issued in fiscal year 2013.

3.2.4 Mercury and Air Toxics Standard

On February 16, 2012, EPA promulgated the National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units. The rule is commonly referred to as MATS, which stands for Mercury and Air Toxics Standard. The standard will apply to 13 facilities in Virginia. Sources have until April 16, 2015, to comply with the rule but may request a one-year compliance extension.

3.2.5 Fumigation

The 2011 General Assembly added §10.1-1308.01, Qualified Fumigation Facilities (QFFs), which exempts from minor source air permitting requirements small fumigation operations that fumigate commodities. These facilities usually use methyl bromide or phosphine, both of which are HAPs under the CAA. Facilities using less than 10 tpy of any HAP avoid permitting as long as certain conditions are met such as reporting specific operational information to VDEQ and maintaining a buffer zone to limit public exposure outside the fence line of the property.

VDEQ staff developed a Fact Sheet and Notification/Final Report Form for QFF use and an implementation document for VDEQ staff. Outreach was provided to the regulated community through industry organizations and workshops. For fiscal year 2012, VDEQ received notifications for more than 650 fumigation events at approximately 40 different locations. The majority of the facilities conducting fumigation activities are located in the Tidewater and Richmond areas.

3.2.6 Outer Continental Shelf Permitting

Section 328 of the CAA requires the regulation of air pollution sources located on the Outer Continental Shelf (OCS). States may request the permitting authority for those sources located within 25 miles of the coast, and Senate Bill 659 (2010) directed VDEQ to do so. This delegation must be accomplished in two phases. First, EPA conducts a consistency evaluation and adopts the state regulations into 40 CFR Part 55. Once that has been accomplished, a state may request EPA to delegate those requirements back to the state. Both parts were completed in fiscal year 2012, and VDEQ is now the air permitting authority for any projects within 25 miles of the Virginia coast.

3.3 Air Compliance Activities

The purpose of the compliance program is to enforce all applicable state and federal air regulations and laws. The goal is for facilities operating within the Commonwealth to be

compliant with those regulations and laws, and the focus is to provide the necessary compliance and/or enforcement assistance to correct detected violations as expeditiously as possible. These concepts support VDEQ's mission to protect the environment and human health.

To ensure that industry constructs and operates within the boundary of applicable laws and regulations, VDEQ's air compliance program operates in a manner that is consistent with EPA's 2001 National Compliance Monitoring Strategy (CMS). This strategy targets the largest potential emitters of air pollution for a full compliance evaluation (FCE) at a minimum recommended frequency of once every two years. An FCE consists of a comprehensive evaluation of the facility records and equipment associated with pollutant emissions, to include the examination of documents detailing throughputs, emissions, testing, and reporting, in order to determine the facility's overall compliance status. The compliance status of Virginia's regulated facilities is reported to EPA weekly and is publicly available on EPA's Environmental Compliance and History Online (ECHO) external website.

3.3.1 Inspection Planning

VDEQ advocates the use of a risk-based concept when identifying facilities for an FCE. This concept was developed by VDEQ and is being used in collaboration with the CMS to develop annual inspection plans; it also has a multimedia component. Referred to as VDEQ's Risked Based Inspection Strategy or RBIS, it provides flexibility to use resources where they are most needed. EPA granted VDEQ approval to exercise the risk-based concept on a three-year trial basis with EPA Region 3 oversight. The program is currently being evaluated by EPA.

Virginia is the only EPA Region 3 state with a formal risk-based strategy. The RBIS may identify facilities that are not a focus of the CMS strategy, and the RBIS may be used to justify increases or decreases in the frequency of inspections. Determinations of increased or decreased inspection frequencies are based on risk qualifiers such as participation in the environmental enhancement program, compliance history, facility type, environmental sensitivity, multi-media applicability, environmental justice (concerns and complaints), and agency initiatives.

3.3.2 Sources Evaluated for Compliance

Virginia has over 4,300 registered facilities, not including nearly 1,200 Stage II facilities (gas service stations in the Richmond area and Northern Virginia). In June 2009, VDEQ signed a Memorandum of Understanding (MOU) with EPA Region 3 accepting delegation to enforce 23 of 26 federal area source MACT regulations and since then has accepted delegation of another seven. These regulations apply to a substantial universe of facilities emitting toxic pollutants below major source and minor source NSR permitting thresholds. As part of the MOU, VDEQ agreed to support EPA through outreach efforts for the three area source MACT regulations not accepted while EPA retained sole implementation and enforcement authority. The three area source MACT regulations for which VDEQ has not taken delegation are the reciprocating internal combustion engine standards, the gasoline dispensing standards, and the auto body

refinishing standards. These three area source MACT regulations are estimated to constitute a source population of more than 20,000 in Virginia.

For the 2011 federal fiscal year, the air compliance program conducted over 8,400 partial and full compliance evaluations, including over 1,400 on-site inspections and nearly 60 stack test observations. The air compliance program issued 360 formal and/or informal enforcement actions.

3.3.3 Small Business Assistance

The Small Business Assistance (SBA) program is required by Virginia law and mandated under the CAA. The air compliance program provides various forms of compliance assistance to potentially thousands of small businesses throughout the Commonwealth. These services are provided at no cost to facilities in order to inform, educate, and assist small businesses in complying with environmental regulations. Examples are the dry cleaner and Stage II calendars made available to small businesses to improve understanding of those regulations.

3.4 Air Enforcement Activities

The goal of enforcement is to take appropriate actions to address violations of environmental laws and return facilities to compliance with Virginia's statutory and regulatory requirements. The mechanism used by VDEQ to achieve compliance must be proportional to the violation, responsive to the facility's compliance history, and protective of human health and the environment. In addition, an appropriate enforcement action, which may include a civil charge and recovery of economic benefit, sends a message of deterrence to the regulated community.

EPA's guidance on timely and appropriate enforcement response to high priority violations (HPVs) articulates the mutual expectations of the respective parties of the federal - state partnership in the enforcement of air pollution control requirements for stationary sources. VDEQ's enforcement staff is responsible for implementing this policy. This policy applies to all major (as defined by the CAA) stationary sources of air pollution that are in violation of a federally enforceable regulation and helps prioritize federal and state agency enforcement efforts with respect to sources of air pollution in their jurisdictions.

Agency HPV activities are designed to identify and to expeditiously return to compliance those violating sources that the agency believes are environmentally most important, namely the HPVs. The policy also promotes a more complete and accurate compliance picture and enhances the responsibility of the agency, as well as EPA, to track and address all violations. An essential part of this tracking process is assuring that all HPVs are promptly entered into the shared EPA-state database.

In federal fiscal year 2011, 36 consent orders were issued (six of which were HPVs) and resulted in the collection of $1,309,518.61 in civil charges and $122,269.00 of mitigated charges through the implementation of a supplemental environmental project.

3.5 Motor Vehicle Inspection and Maintenance Program

Vehicle inspection and maintenance programs (I/M) help improve air quality by identifying high-emitting vehicles in need of repair and causing them to be fixed as a prerequisite to vehicle registration within a given non-attainment area. The CAA made I/M mandatory for several areas across the country, based upon criteria such as air quality classification, population, and/or geographic location. VDEQ created a decentralized I/M program that retains the convenience of having emissions inspections and repairs performed in the same stations but uses the latest accepted technology to determine which vehicles emit excessive pollutants.

In 2005, VDEQ updated the program to allow for testing of the on-board diagnostic (OBD) systems on model year 1996 and newer vehicles. OBD systems monitor key components of the vehicle's emission control system, record any diagnostic trouble codes, and warn the driver if there is a condition that could cause excess emissions. Beginning with model year 2009, all vehicles up to 14,000 pounds are required by federal mandate to be OBD-compliant.

The Northern Virginia I/M program provides significant air pollution reduction benefits in the Northern Virginia area. Vehicles up to 10,000 pounds gross vehicle weight rating (GVWR) and newer than 25 model years are required to pass an emissions test or receive a waiver every two years in order to be registered. Nearly 40,000 vehicles failed the initial test and received repairs in calendar year 2011.

3.5.1 Mobile Source Operations Section

The Mobile Source Operations Section (MSOS) is part of the Northern Virginia Regional Office and monitors the performance of the various service stations, certified emissions repair facilities, and licensed emissions inspectors within the I/M program. In calendar year 2011, over 824,000 vehicles were inspected. MSOS personnel conducted over 500 separate audits during that time frame, including 175 covert audits, of approximately 490 emission inspection facilities. MSOS routinely handles in excess of 1,100 calls per month from citizens, inspectors, repair technicians, and others.

3.5.2 On-Road Emissions Monitoring Program

As required by the CAA, each vehicle emissions inspection program must conduct remote sensing of vehicle emissions in the program area. In the On-Road Emissions (ORE) monitoring program, vehicles with very high emissions as identified by remote sensing devices are sent a Notice of Violation (NOV) and are required to make any necessary repairs to their vehicles. Owners of vehicles observed by remote sensing to be exceptionally clean are notified that their vehicle has received a clean screen, which constitutes an emission inspection pass. VDEQ also implemented procedures to provide repair assistance to low-income vehicle owners whose vehicles were found to be high emitters through remote sensing.

After nearly six years of operation, the ORE program has identified over 1,500 vehicles as gross emitters and issued over 1,350 clean screen passes. The gross emitters were repaired

and passed an emissions test, taken off the road, or sold outside of the Northern Virginia program area. Currently about 18% of the Northern Virginia fleet that is subject to the I/M program is observed.

Studies by EPA in other states have indicated that remote sensing can be used to identify vehicles with very high evaporative emissions, possibly coming from leaking fuel tanks or lines. VDEQ notifies owners of such vehicles that they may have a gasoline leak, which could be a potential safety issue. The notice is advisory only.

The 2012 General Assembly passed legislation expanding the number of vehicles that may be eligible to receive a clean screen. Certain vehicle owners will have the option of getting a station test or purchasing a clean screen pass. Eventually up to 30% of the cleanest vehicles may be eligible. VDEQ has begun developing regulations to implement these statutory changes.

4 Control Programs

As shown in Figure 4-1, emissions of VOC, NO_X, and SO_2 are expected to decrease significantly from 2002 levels even though growth in both vehicle miles traveled and population is expected to continue through 2018. These projected reductions are the result of several control programs being implemented at the federal level as well as programs being implemented in the Commonwealth. Some of these programs are described in the following paragraphs.

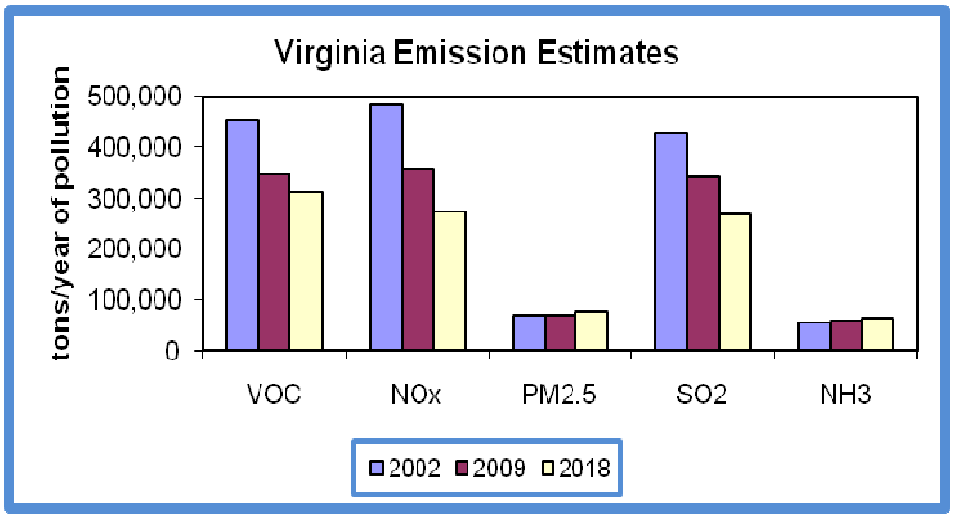

Figure 4-1: Anthropogenic Emission Estimates for the Commonwealth

4.1 Mobile Source Programs

As noted in Figure 4-2 and Figure 4-3, emissions of VOC, NO_X, SO_2, and $PM_{2.5}$ from the mobile source sector in Virginia are expected to decrease significantly in future years. Mobile sources are generally pollution-emitting activities that move by their own power on public roadways. Examples are cars and trucks. The expected decreases in this emissions sector are the

result of federal regulatory programs that require emission reductions from vehicles such as automobiles and heavy duty diesel trucks.

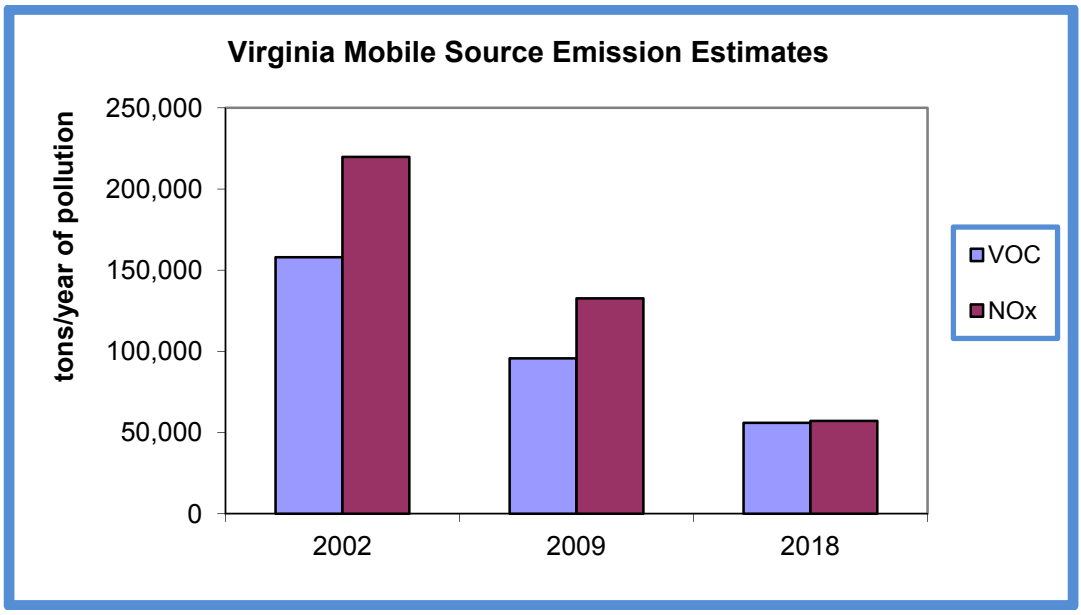

Figure 4-2: $PM_{2.5}$ and SO_2 Emissions from Mobile Sources in Virginia

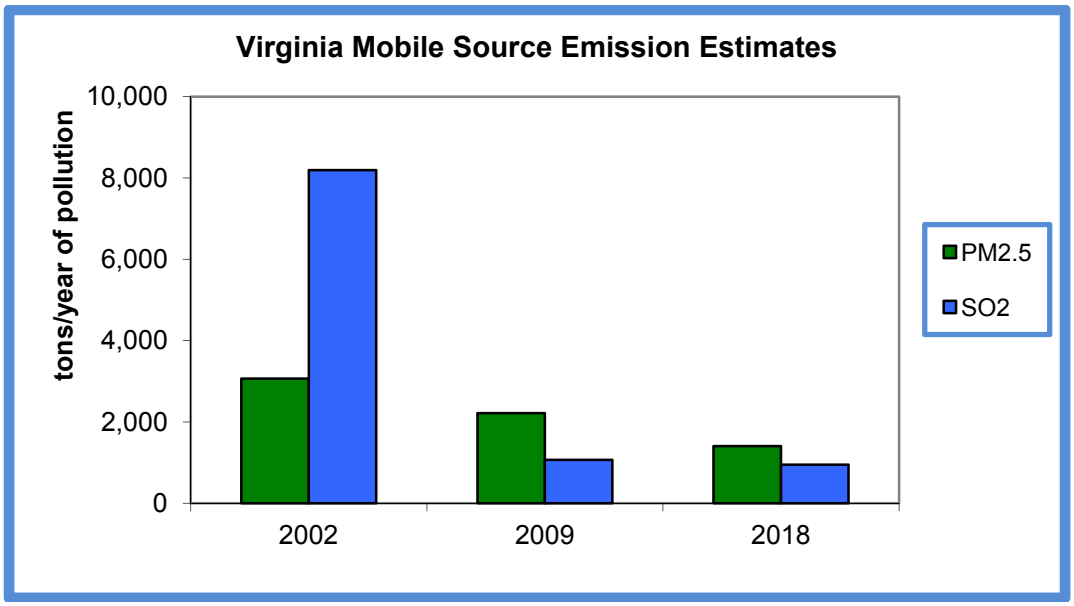

Figure 4-3: VOC and NO_X Emissions from Mobile Sources in Virginia

4.2 Product Based Programs

A variety of both state and federal control programs are being implemented that reduce emissions from product-based categories such as the use of portable fuel containers; the coating of architectural supports; the application of traffic markings; the use of personal products such as

deodorant and hair spray; and the use of household products such as cleaners and pesticides. These types of programs have been implemented in the northern Virginia area and the Fredericksburg area. These regulations generally target VOC emissions but can also help decrease public exposure to harmful chemicals.

4.3 Non-Road Control Programs

Non-road equipment consists of devices with an engine where the power from the engine is generally not used to move the equipment along roadways. Examples are lawn mowers, weed eaters, diesel generator sets, gasoline generator sets, marine engines, and locomotive engines.

Federal regulations have been finalized that control emissions of various pollutants from all these categories. Most of these regulations have phase-in periods, where standards are more stringent for equipment manufactured in later years. These federal standards will result in a 60% to 90% reduction in air pollutants. Air pollution benefits are related to the purchase of new equipment, and the benefits to air quality continue until the entire fleet of a type of equipment has been replaced.

In addition to engine standards, the non-road heavy duty diesel engine standards and the rail and marine vessel standards require the phase-in of much cleaner diesel fuel. Non-road engines were required to use diesel fuel with no more than 15 ppm sulfur beginning in 2010. Railroad and marine vessels must use diesel fuel with no more than 15 ppm sulfur beginning in 2012. The cleaner fuels allow more efficient engine operation, facilitate the use of state-of-the-art emissions controls on new units, and directly result in greatly reduced SO_2 emissions from such equipment.