



Economic Impact Analysis Virginia Department of Planning and Budget

9 VAC 5-20 and 9 VAC 5-40 – VOC Emission Standards

Department of Environmental Quality

May 22, 2003

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.G of the Administrative Process Act and Executive Order Number 21 (02). Section 2.2-4007.G requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. The analysis presented below represents DPB's best estimate of these economic impacts.

Summary of the Proposed Regulation

The General Assembly mandates in §10.1-1308 of the Code of Virginia that the State Air Pollution Control Board promulgate regulations abating, controlling, and prohibiting air pollution throughout or in any part of the Commonwealth.

The proposed regulatory action adds four new sections to existing regulations for the control and abatement of air pollution. It establishes new emission standards (emission limits and control technology requirements) and other requirements for portable fuel containers, mobile equipment repair and refinishing operations, and architectural and industrial maintenance coatings. It also proposes more stringent emission standards and requirements than currently required for solvent metal cleaning operations. The new and amended standards and requirements being proposed only apply to persons and sources in the Northern Virginia volatile organic compounds (VOC) emissions control area (Counties: Arlington, Fairfax, Loudoun, Prince William, and Stafford; Cities: Alexandria, Fairfax, Falls Church, Manassas, and Manassas

Park). The proposed regulatory action also amends the documents incorporated by reference to take into account the new standards and requirements being proposed.

Estimated Economic Impact

Rationale:

The federal Clean Air Act requires the Environmental Protection Agency (EPA) to prescribe primary and secondary air quality standards (developed for the protection of public health and public welfare, respectively) for each air pollutant for which air quality criteria were issued before the enactment of the Clean Air Act in 1970. These standards are known as the national ambient air quality standards (NAAQS) and they establish the maximum limits of pollutants that are permitted in the outside ambient air.

The Clean Air Act also requires each state to adopt and submit to EPA a plan (the state implementation plan or SIP) that provides for the implementation, maintenance, and enforcement of NAAQS within each air quality control region in the state. The Clean Air Act establishes a process for evaluating air quality in each region and identifying and classifying non-attainment areas according to the severity of the air pollution problem. Non-attainment areas are classified as marginal, moderate, serious, severe, and extreme and subject to more stringent measures as the classification moves from marginal non-attainment to extreme non-attainment. The Clean Air Act requires EPA to propose geographic boundaries and pollution classification levels for all non-attainment areas in each state based on air quality data from that state. Following the establishment of non-attainment areas, each state is then required to submit an SIP demonstrating how it intends to achieve NAAQS in each non-attainment area. The SIP specifies how the state intends to reduce air pollution concentrations to a level at or below these standards. Once the pollution levels are at or below NAAQS levels, the SIP also demonstrates how the state intends to maintain air pollution concentrations at the reduced levels.

Effective July 1, 2003, parts of northern Virginia will be classified as severe non-attainment areas for ozone and its precursors, volatile organic compounds or VOCs. The Northern Virginia VOC emissions control area includes the counties of Arlington, Fairfax, Loudoun, Prince William, and Stafford and the cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park. The Northern Virginia VOC emissions control area is currently classified as a serious non-attainment area. As a result of deterioration in air quality and change

in the federal ozone standard its classification is being changed to a severe non-attainment area. The changes being proposed are additional measures to be incorporated into the SIP to bring VOC emissions to a level at or below NAAQS for ozone in northern Virginia. These measures were decided upon before the reclassification and DEQ believes that the reclassification makes them even more essential. Failure to prepare such a plan and/or failure to obtain EPA approval for such a plan could result in sanctions such as the loss of federal funds for highways and other projects and EPA promulgating and implementing an air quality plan for Virginia.

Description of the Regulation and Estimated Economic Impact:

The proposed regulation adds four new sections to the existing regulation for the control and abatement of air pollution. The new sections apply only to the Northern Virginia VOC emissions control area. The four new sections relate to:

Portable Fuel Container Spillage Control: The proposed regulatory action establishes VOC emission standards from portable fuel containers and spouts. The requirements of this section apply to all individuals and businesses manufacturing, selling, or supplying portable fuel containers and spouts in northern Virginia with a capacity larger than one-fourth of a gallon but less than or equal to ten gallons. The provisions of this section do not apply to the following: manufacturers and distributors who can demonstrate that the portable fuel container and/or the spout is for sale outside the Northern Virginia VOC emissions control area and that they have taken reasonable precautions to prevent its distribution in northern Virginia, rapid refueling devices with a capacity greater than or equal to four gallons, safety cans and portable marine fuel tanks operated in conjunction with outboard engines, and certain types of portable fuel containers meeting federal fire protection and prevention requirements.

The proposed regulatory action requires that all portable fuel containers and spouts have an automatic shut-off to prevent overfilling, are capable of automatically closing and sealing the container and/or spout when not dispensing fuel, provide a fuel flow rate and fill level specified in the regulation, do not exceed a permeation rate of 0.4 grams per gallons per day, and are under a manufacturers warranty for at least one year in case of defects in material or workmanship. In addition, portable fuel tanks are required to have only one opening for both filling and pouring. The proposed regulation specifies the test methods to determine compliance with these requirements and the notification, record keeping, and reporting requirements to be met by

manufacturers. The proposed regulation also specifies additional labeling and administrative requirements. All portable fuel containers and spouts manufactured after January 1, 2005 will have to meet these standards. Barring the granting of a waiver, all manufacturers and distributors will also have to meet the standards and requirements of this regulation by January 1, 2005.

The standards being proposed are identical to model rules established by the Ozone Transport Commission (OTC)¹ and standards implemented by other states such as Maryland and California. According to a study by the OTC², portable gas containers with a capacity between one and six gallons currently cost an average of \$4.25. They estimate that gas containers meeting the specifications of this rule would cost an average of \$12.33, almost three times what gas containers not meeting these requirements currently cost. Based on these calculations, the report concludes that the cost of compliance with these requirements is \$450 per ton of VOC reduced. The OTC report estimates that the model rule benefit for northern Virginia for 2005 is VOC emissions reduction of 2 tons per day. Daily VOC emissions reductions of 2 tons would mean annual VOC emissions reductions of 730 tons. At \$450 per ton of VOC reduced, the proposed change would cost an estimated \$328,500 on an annualized basis.

Solvent Cleaning: The proposed regulatory action establishes emission standards for solvent metal cleaning operations. Regulations currently exist in Virginia establishing emission standards for solvent metal cleaning operations using non-halogenated solvents. However, the standards being proposed for the Northern Virginia VOC emissions area are significantly more stringent. The requirements of the regulation apply to solvent metal cleaning operations including cold or vapor degreasing at service stations, motor vehicle repair shops, automobile dealerships, machine shops, and any other metal refinishing, cleaning, repair, or fabrication facility. DEQ believes that the proposed standards are likely to most affect operations at automobile repair and maintenance facilities and electronics and furniture manufacturers. The proposed regulation applies to cold cleaning machines that process metal parts and contain more than one liter of VOC, batch vapor cleaning machines that process metal parts, all in-line vapor cleaning machines, all airless cleaning machines, and air-tight cleaning machines that process

¹ The OTC was formed by Congress in 1990 to help coordinate plans for reducing ground-level ozone in the Northeast and mid-Atlantic states. Twelve states including Virginia are represented in the OTC.

metal parts. In addition, certain provisions of the regulation apply to sellers and manufacturers of solvents for use in cold cleaning machines.

The proposed regulatory action requires vapor cleaning machines covered by this regulation to meet certain hardware requirements and operating procedures (including monitoring, recordkeeping, and labeling requirements). Cold cleaning machines covered by this regulation are required to meet solvent volatility limits in addition to hardware requirements and operating procedures. Airless cleaning machines and air-tight cleaning machines covered by this regulation are required to meet specific emission standards in addition to required operating procedures. Manufacturers of cold cleaning machine solvents containing VOCs will be required to provide additional information to the buyer. Use of some types of cold cleaning machine solvents containing VOCs and some types of cold cleaning machines (such as those using air agitated solvent baths) will be prohibited under this regulation. All solvent metal cleaning operations and manufacturers affected by the regulation will be required to comply with its requirements by January 1, 2005.

The standards being proposed are identical to model rules proposed by the OTC and standards implemented by other states such as Maryland and Illinois. The OTC report estimates the cost effectiveness of the proposed change to be \$1,400 per ton of VOC reduced. The cost estimate is based on the South Coast Air Quality Management District's³ cost analysis for their solvent cleaning rule. According to DEQ, while the regulation does prohibit the use of certain types of machines and solvents, it is not likely to result in many machines becoming redundant. In DEQ's opinion, the operational and training requirements to ensure that solvent metal cleaning machines are operated such that VOC emissions are kept below required levels is likely to be the most burdensome aspect of the regulation. The OTC report estimates that the solvent cleaning model rule benefit for northern Virginia is VOC emissions reduction of 9 tons per day. Daily VOC emissions reduction of 9 tons would mean annual VOC emissions reductions of 3,285 tons. At \$1,400 per ton of VOC reduced, the proposed change would cost an estimated \$4.6 million on an annualized basis.

² "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules", by E.H. Pechan and Associates, prepared for the Ozone Transport Commission, March 31, 2001.

³ The South Coast Air Quality Management District is the air pollution control agency for Orange County and major portions of Los Angeles, San Bernardino and Riverside counties in Southern California.

Mobile Equipment Repair and Refinishing: The proposed regulatory action establishes emission standards for mobile equipment repair and refinishing operations. The proposed changes apply to all mobile equipment repair and refinishing operations in the Northern Virginia VOC emissions control area. This includes any facility applying automotive pretreatment, automotive primer-surface, automotive primer-sealer, automotive topcoat, or automotive specialty or color matched coating to mobile equipment and mobile equipment components. Mobile equipment refers to any equipment that may be driven or is capable of being driven on a roadway such as automobiles, trucks (including truck cabs, truck bodies, and truck trailers), buses, motorcycles, utility bodies, camper shells, mobile cranes, bull dozers, street cleaners, golf carts, ground support vehicles used at airports, and farm equipment. Certain provisions of the regulation apply to manufacturers and distributors of the affected coatings. Mobile equipment and refinishing operations subject to existing emission standards for automobile and light duty truck coating application systems and/or existing emission standards for miscellaneous metal parts and products coating application systems are exempt from the requirements of this regulation. Persons applying coatings that do not receive compensation for the application of the coating are also exempt from the requirements of this regulation.

The proposed regulation requires mobile equipment repair and refinishing operations to apply finish material according to application techniques specified in the regulation. According to DEQ, the list of acceptable application techniques was found to be comprehensive by the Washington Metropolitan Auto Body Association. Exemptions to these requirements include the use of airbrush application methods for stenciling, lettering, and other identification markings, application of coatings sold in non-refillable aerosol containers, and application of automotive touch-up repair finish materials. Spray guns used to apply mobile equipment repair and refinishing coatings are to be cleaned according to the specifications of the regulation such that solvent loss is minimized. Mobile equipment repair and refinishing operations are required to implement certain housekeeping, pollution prevention, and training measures in order to comply with the requirements of this regulation. The proposed regulation also establishes VOC content limits for paints used in the industry that are consistent with federal VOC limits for mobile equipment refinishing materials. The VOC per volume of coating limits for automotive pretreatment primers, automotive primer-surface, automotive primer-sealer, automotive single

and multi-stage topcoat, automotive multi-colored topcoat, and automotive specialty coating are likely to affect the manufacturers and distributors of such coatings.

The standards being proposed are identical to model rules proposed by the OTC and standards implemented by other states such as Maryland and Pennsylvania. DEQ believes that, for the sake of operator safety and product conservation (approximately 30% less paint is consumed when using the high-efficiency equipment required by this regulation), most mobile equipment repair and refinishing operations voluntarily meet some of the requirements being proposed. The OTC report estimates the cost effectiveness of the proposed change to be \$1,534 per ton of VOC reduced. The report also estimates that the mobile equipment repair and refinishing model rule benefit for northern Virginia is VOC emissions reduction of 2 tons per day. Daily VOC emissions reductions of 2 tons would mean annual VOC emissions reductions of 730 tons. At \$1,534 per ton of VOC reduced, the proposed change would cost an estimated \$1.1 million on an annualized basis.

Architectural and Industrial Maintenance Coatings: The proposed regulatory action establishes emission standards for architectural and industrial maintenance coatings in northern Virginia. The requirements of the regulation apply to manufacturers and distributors of architectural coatings and all individuals who apply or solicit for application any architectural coating (industrial maintenance coatings are defined as high-performance architectural coatings formulated for application to surfaces exposed to extreme environmental conditions). The provisions of this section do not apply to aerosol coating products, architectural coating sold in containers with a capacity of one liter or less, and architectural coatings that are sold or manufactured for use exclusively outside the Northern Virginia VOC emissions control area or for shipment to other manufacturers for reformulation and/or repackaging.

The proposed regulation requires the manufacturers, distributors, and users of architectural coating not to manufacture, sell, or use coating that exceeds VOC emissions limits specified in the regulation for various types of architectural coatings. The VOC content limits are based on suggested control measures adopted by the Air Resources Board and the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials. The regulation specifies the test methods and procedures (based on EPA guidelines) to be used by manufacturers to demonstrate compliance with the VOC content limits.

Manufacturers are also required to meet container labeling as well as notification, recordkeeping, and reporting requirements specified in the regulation. Users/appliers of architectural coatings are required to meet operational procedures and requirements specified in the regulation. Manufacturers, distributors, and users of architectural coatings are required to comply with the requirements of the regulation by January 1, 2005. All coating manufactured after January 1, 2005 are required to meet the VOC content limits specified in the regulation and coating manufactured prior to January 1, 2005 are allowed to be sold until December 31, 2007.

The standards being proposed are identical to model rules proposed by the OTC and standards implemented by other states such as Delaware. DEQ believes that the proposed regulation will primarily affect manufacturers of architectural and industrial maintenance coatings and that the reformulation of such coatings to meet the VOC content limits is likely to be the most burdensome aspect of the regulation. Architectural and industrial maintenance coatings currently meeting the VOC content limits cost approximately the same as coatings not meeting these limits. The OTC report estimates that the cost effectiveness of the proposed change to be \$6,400 per ton of VOC reduced⁴. The OTC cost was estimated based on the Air Resource Board's cost analysis of the suggested control measures. The OTC report estimates that the model rule benefit for northern Virginia for 2005 is VOC emissions reduction of 5 tons per day. Daily VOC emissions reductions of 5 tons would mean annual VOC emissions reductions of 1,825 tons. At \$6,400 per ton of VOC reduced, the proposed change would cost an estimated \$11.7 million on an annualized basis.

DEQ has proposed the above four rules as possible ways by which to reduce VOC emissions in the Northern Virginia VOC emissions control area. The Metropolitan Washington Air Quality Committee (MWAQC)⁵, based on projected future emissions and other regional data, determined that the proposed rules were necessary for the area to meet its emissions reductions and attainment requirements. MWAQC decided on January 23, 2002 that Washington, D.C., Maryland, and Virginia would adopt the proposed regulations. Maryland already has regulations in place similar to the portable fuel container spillage control rule, the solvent cleaning rule, and

⁴ This estimate incorporates coating manufacturers' cost of reformulating architectural coating to meet the VOC content limits and DEQ believes these costs to be inflated.

⁵ A body of locally affected officials certified by the mayor of Washington, D.C. and the governors of Maryland and Virginia to prepare an air quality plan for the DC-Maryland-Virginia metropolitan statistical area

the mobile equipment repair and refinishing rule being proposed and is in the hearings process for the architectural and industrial maintenance coating rule. Washington, D.C. is in the process of promulgating and adopting all four rules. Many states in the Northeast and the mid-Atlantic regions have promulgated or are in the process of promulgating regulations along the lines of the regulations being proposed in Virginia. So much so that the OTC produced a study providing estimates of the emissions reductions for each state within the OTC jurisdiction associated with the implementation of each of the rules (based on current federal and state regulations and SIP assumptions) as well as the costs associated with implementing each rule.

DEQ estimates that the proposed regulatory action will affect 193 manufacturers of portable gas cans, automobile refinishing coatings, and architectural coatings. In addition, 392 service stations and 4 degreasing and solvent recovery facilities will be affected by the solvent cleaning rule, and 237 automotive refinishing facilities will be affected by the mobile equipment repair and refinishing rule. The number of distributors of portable gas cans and coatings (architectural and automobile refinishing), the number of cold cleaning solvent manufacturers, and the number of users/appliers of architectural coatings could not be determined. The estimated economic impact of the proposed regulatory action is the sum of the economic impact of each of the four rules being proposed.

Once full emissions reductions are achieved, the annualized costs associated with implementing the portable fuel container spillage rule, the solvent cleaning rule, the mobile equipment repair and refinishing rule, and the architectural and industrial maintenance coating rule are \$328,500, \$4.6 million, \$1.1 million, and \$11.7 million, respectively. According to DEQ, full reductions for the portable fuel container spillage rule will be achieved by 2015 when the last of the old gas cans are replaced. DEQ expects that full reductions for the remaining three rules will most likely be achieved within a year of the effective date of the rule. Total annualized costs associated with the proposed regulatory action once full reductions from all four rules have been achieved will be approximately \$17.7 million (assuming VOC reductions of equal increments in each year between 2005 and 2015 resulting from the implementation of the portable fuel container spillage rule and a discount rate of 5.89%, the average yield on ten year Treasury bonds between 1993 and 2002).

Implementing the proposed changes will also result in some economic benefits. The adoption of these four rules is likely to significantly reduce emissions of VOCs in the Northern Virginia VOC emissions control area. The emissions reductions are likely to be beneficial to public health and welfare. According to EPA, exposure to ozone at the ground level can cause a number of respiratory problems such as irritation of the respiratory system, reduced operation of the lungs, inflammation and damage to the cells lining the lungs, and aggravation of existing lung problems. Repeated ozone exposure can cause permanent damage to children's developing lungs and accelerate the decline in lung function with age in adults. Reducing the level of ozone will provide economic benefits in the future in terms of respiratory health problems and fatalities prevented (reflected in lower health care and other costs) because of lower amounts of ground-level ozone. The emissions reductions achieved by the implementation of these four rules would also allow Virginia to avoid federal sanctions that would be imposed for violating the SIP provisions of the Clean Air Act. The sanctions include the loss of federal funds for highways and other projects and/or more restrictive requirements for new industries. Moreover, the lack of an acceptable plan to get VOC emissions below NAAQS could also result in EPA promulgating and implementing an air quality plan for Virginia. Implementing the proposed rules would produce economic benefits by allowing Virginia to continue to receive federal funds and letting Virginia run its own air quality program.

The net economic impact of the proposed regulatory action will depend on whether the economic benefits of implementing these rules is greater than or less than the costs of doing so. The estimated cost of the proposed regulatory action is approximately \$17.7 million. It is not possible at this time to estimate the number and severity of respiratory problems and fatalities that will be prevented as a result of implementing these regulations. The extent of federal funding retained as a result of implementing the proposed regulatory action is also not known. Moreover, there are no studies or data available at this time estimating the economic benefits of having air quality programs run by states rather than by the federal government.

Alternative to the Proposed Regulatory Action:

Alternatives to the proposed regulatory action considered by DEQ were to take no action or to make alternative regulatory changes to those required by provisions of the law and associated regulations and policies. Market-based mechanisms such as emissions cap-and-trade

programs⁶ were not explicitly stated as an alternative considered by DEQ. Such programs exist for reducing emissions of air pollutants such as nitrogen oxides (NO_x), sulfur dioxide, and VOCs at the federal and state level. In fact, Virginia has an emissions allowance-trading program for sources producing NO_x emissions. §10.1-1322.3 of the Code of Virginia authorizes DEQ to consider market-based mechanisms as an option when formulating regulatory actions for achieving and maintaining NAAQS.

The market-based emissions reduction program implemented in the Chicago ozone non-attainment area is the closest model of a program that could be applied to the Northern Virginia VOC emissions control area. The Chicago ozone non-attainment area has an emissions allowance-trading program that covers a large number of sources producing VOC emissions in the region. Parts of northern Illinois in and around Chicago have been classified by EPA as severe ozone non-attainment area. Under provisions of the federal Clean Air Act, the area must attain NAAQS by 2007. Illinois already has a number of technology-based or command and control rules, similar to those being proposed in Virginia, to limit VOC emissions from stationary sources. In order to meet the additional VOC emissions reductions required by the federal Clean Air Act for the Chicago ozone non-attainment area, Illinois considered the implementation of further command and control measures. However, because the less expensive command and control rules had already been implemented, the only options available were rules with a very high cost of implementation.

In order to minimize the cost of further VOC reductions, Illinois chose instead to pursue a market-based approach to reducing VOC emissions. The emissions reduction market system (ERMS) was introduced in 2000. The ERMS is a cap-and-trade program in which participating sources must hold trading units equivalent to their VOC emissions. Each participating source is given a baseline depending on their actual VOC emissions in previous years adjusted for their compliance or noncompliance with existing rules. They are then issued trading units based on their baseline and adjusted for a 12% reduction in VOC emissions. Exceptions are provided for

⁶ According to EPA, cap-and-trade is a policy approach to controlling large amounts of emissions from a group of sources at costs that are lower than if the sources were regulated individually. The approach first sets an overall cap, or maximum amount of emissions per compliance period, that will achieve the desired environmental effects. Authorizations to emit in the form of emission allowances are then allocated to affected sources, and the total number of allowances cannot exceed the cap. Individual control requirements are not specified for sources. The

some sources for which emissions cannot be further reduced. Including exceptions and contingencies the program produces an overall VOC emissions reduction of 9% compared to the baseline. The ERMS operates from May 1 to September 30 (the time ground-level ozone formation is at its maximum) and trading units are retired after each season in order to account for each source's VOC emissions during the season. Thus, participating sources can either limit their emissions (through emissions controls or changes in technology) to the number of trading unit allotted to them or buy additional trading units from other sources in order to cover their excess emissions. Total VOC emissions are capped by the number of trading units issued. Even while participating in the program, ERMS participants are subject to all existing state and federal rules to limit VOC emissions.

The ERMS has been operating for three years and appears to be meeting its emissions reduction objectives. In 2001, there were 172 participating sources (excluding exempt sources) in the ERMS program. According to the annual performance review report for 2001, the ERMS program has achieved desired emissions reductions. In fact participating sources were found to be performing significantly below the baseline and allotment levels (allotments show a 9.6% and 9.9% reduction from the original baseline for all participating sources in 2000 and 2001, respectively). Moreover, the report found that the market-based system operated effectively with sources able to find trading partners (there was a sufficient supply of available trading units and market prices were conducive to trading).

Market-based emissions reduction programs have several economic advantages over technology-based command and control regulations. (i) They increase the flexibility of affected sources in meeting the emissions reduction requirements. Sources can still choose to limit their emissions by placing emission controls and through changes in technology. In addition, under a market-based program, sources facing high cost options to limit their emissions can trade with other sources not using all of their allotted trading units or facing less costly ways of lowering their emissions. Sources not currently using their entire allotment of trading units will be able to receive compensation for surplus trading units that would otherwise have been worthless, sources exceeding their allotment will be able to continue to emit VOCs, and the entire area would continue to meet its aggregate emissions reduction target. Moreover, sources with low

only requirements are that sources completely and accurately measure and report all emissions and then turn in the

cost options to reducing emissions will have an incentive to reduce their VOC emissions and sell the surplus trading units to other sources that would otherwise have to spend more money to reduce their own emissions. Thus, implementation of a market-based program provides more flexibility to sources emitting VOCs to choose the most cost-effective method of meeting emissions reduction targets and creates incentives for the adoption of low-cost emissions reduction technologies. (ii) Market-based programs are more likely to result in actual VOC emissions reductions than technology-based measures. A major problem with technology-based command and control measures has been enforcement. Better enforcement of emissions reduction targets is likely to lead to the attainment of NAAQS in a shorter time and produce economic benefits by reducing the number and severity of illnesses and fatalities from exposure to ground-level ozone. By requiring sources to monitor and report their emissions and by basing trading unit allotments on these emissions, a cap-and-trade program reduces the incentive for non-compliance and thus increases the chances for actual emissions reductions. According to an EPA analysis of the federal sulfur dioxide cap-and-trade program (or the acid rain program), compliance has been at a near-perfect 99%. Reductions in the early years of the program were 25% below allowable levels. In fact, according to EPA, the federal sulfur dioxide cap-and-trade program has achieved greater emissions reductions in the given time than any other single program to control air pollution. (iii) Market-based programs also tend to be less expensive to implement than technology-based command and control measures. The operation and design of market-based programs such as cap-and-trade programs are relatively simple and this helps keep compliance and administrative costs low. According to EPA, cost savings from implementing cap-and-trade programs have been significant, as expensive source-specific reductions no longer have to be imposed and enforced on each source. The federal sulfur dioxide trading program ended up costing 75% less than cost estimated at the time the program was implemented. Moreover, emissions monitoring and reporting requirements of market-based programs are not likely to be any more burdensome than similar requirements of most technology-based measures. (iv) The design of the ERMS program provides additional economic benefits over technology-based measures. The ERMS program is implemented only during the times of the year when ozone concentrations at the ground level are the highest, i.e., between May and September. By running the program only during these times, ERMS creates an incentive for sources to

same number of allowances as emissions at the end of the compliance period.

reschedule activities that produce VOC emissions to times of the year when the ozone concentration is lower. Thus, sources of VOC emissions will choose to engage in such activities during the high ozone times only if the economic benefits are greater than the costs associated with doing so. It is likely that some sources will choose to postpone these activities to another time of the year when the costs associated with engaging in them is lower. By ensuring that these activities are undertaken during different times of the year based on the cost of engaging in them during those times of the year, the design of the ERMS program will produce efficiency gains.

Overall, market-based programs are more likely to produce actual emissions reductions than technology-based command and control measures reducing the number and extent of illnesses and fatalities resulting from exposure to ozone. Moreover, the emissions reductions are likely to be achieved at a lower cost. Thus, market-based program for reducing emissions are likely to produce maximum benefits for public health and welfare and do so in the most efficient manner and with the least waste of resources.

In formulating a plan for the Northern Virginia VOC emissions control area, the Illinois cap-and-trade program should have been considered and analyzed extensively. The Chicago area has been classified as a severe ozone non-attainment area for some years now despite having technology-based rules similar to those in Virginia. In addition, the Chicago ozone non-attainment area also has regulations in place for portable gas can spillage control, solvent cleaning, mobile equipment repair and refinishing, and architectural and industrial maintenance coatings such as the ones being proposed for the Northern Virginia VOC emissions control area. Despite all these measures, the Chicago area continues to have problems in meeting NAAQS for ozone. While differences in factors such as growth in population and the number polluting industries located in the area may be an issue when evaluating the cost effectiveness market-based mechanisms for reducing VOC emissions, it is recommended that DEQ consider such programs for implementation in the Northern Virginia VOC emissions control area.

Businesses and Entities Affected

The proposed regulatory action will affect manufacturers of portable fuel containers and spouts, manufacturers of cold cleaning solvent used in some solvent metal cleaning operations, manufacturers of automobile refinishing coating, and manufacturers of architectural and

industrial maintenance coating in the Northern Virginia VOC emissions control area. The proposed regulatory action will affect all solvent metal cleaning operations and mobile equipment repair and refinishing operations in the Northern Virginia VOC emissions control area. In addition, the proposed regulatory action will affect distributors of portable fuel containers and spouts and distributors and users/appliers of architectural and industrial maintenance coatings in the Northern Virginia VOC emissions control area.

DEQ estimates that the 193 manufacturers of portable gas cans, automobile refinishing coatings, and architectural coatings will be affected by the proposed regulatory action. Approximately 392 service stations and 4 degreasing and solvent recovery facilities will be affected by the solvent cleaning rule, and 237 automotive refinishing facilities will be affected by the mobile equipment repair and refinishing rule. The number of distributors of portable gas cans and coatings (architectural and automobile refinishing), the number of cold cleaning solvent manufacturers, and the number of users/appliers of architectural coatings could not be determined.

Localities Particularly Affected

The proposed regulation will only affect localities in the Northern Virginia VOC emissions control area consisting of the counties of Arlington, Fairfax, Loudoun, Prince William, and Stafford and the cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park.

Projected Impact on Employment

The proposed regulatory action is likely to have a negative impact on employment. Increasing the cost of operation for businesses engaged in solvent metal cleaning and mobile equipment repair and refinishing could result in people being laid off at these facilities. Moreover, increasing the costs associated with manufacturing cold cleaning solvents and coatings (architectural and automobile refinishing) may lead to some people being laid off at these facilities.

Effects on the Use and Value of Private Property

The proposed regulatory action is likely to have a negative impact on the use and value of private property in the Northern Virginia VOC emissions control area. By imposing additional requirements on facilities engaged in solvent metal cleaning and mobile equipment repair and

refinishing and on manufacturers of cold cleaning solvents and coatings used for architectural and industrial maintenance and automobile refinishing, the proposed regulatory action will impose additional costs and lower the asset value of these businesses. The proposed regulatory action may also have a positive impact on residential properties in the northern Virginia area. Due to a reduction in the amount of ground-level ozone in northern Virginia, some residential properties could see an increase in their market value. However, it is not possible at this time to estimate the exact extent of the increase in market value of these properties resulting from a reduction in ground-level ozone.