An Analysis of EPA's Changes to the Routine Maintenance, Repair and Replacement Exclusion of the New Source Review Program

Prepared for the
Environmental Commissioners of the New England States

June 2004

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Environmental Commissioners of the New England States

by the
Northeast States for Coordinated Air Use Management (NESCAUM)

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UNITS, SPECIES, AND ACRONYMS

Acronyms

BACT – Best Available Control Technology
BART – Best Available Retrofit Technology
CAA – Clean Air Act
CFR – Code of Federal Regulations
EGU – Electricity Generating Unit
EPA – United States Environmental Protection Agency
ERP – Equipment Replacement Provision
IPM – Integrated Planning Model
NAAQS – National Ambient Air Quality Standards
NEI – National Emissions Inventory
NESCAUM – Northeast States for Coordinated Air Use Management
NOV – Notice of Violation
NSPS – New Source Performance Standard
NSR – New Source Review
RMRR – Routine Maintenance, Repair and Replacement
SIC – Standard Industrial Classification
SIP – State Implementation Plan

Chemical Species

CO – carbon monoxide
NO_X – oxides of nitrogen (NO_2 and NO)
PM – particulate matter
PM_{10} – particle matter up to 10μm in diameter
SO_2 – sulfur dioxide
VOC – volatile organic carbon

Units

Mass
lb – pound
g – gram
μg – micrograms (0.000001 x g; 10^{-6} g)
kg – kilograms (1000 x g; 10^3 g)

Power
W – watt (Joules/sec)
kW – kilowatt (1000 x W; 10^3 W)
MW – megawatt (1000000 x W; 10^6 W)

Energy
Btu – British Thermal Unit (= 1055 Joules)
mmBtu – million Btu
MWh – megawatt hour
kWh – kilowatt hour

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Executive Summary

The New Source Review (NSR) program is a critical component of the Clean Air Act's (CAA's) strategy to control emissions from large industrial sources. The NSR program requires all newly constructed industrial facilities – such as power plants, refineries, and chemical manufacturers – to install state-of-the-art pollution control equipment. Historically, it has also required existing facilities to install modern pollution controls when undertaking major modifications or renovations. For many years, NSR has served as the chief regulatory lever to require old sources, "grandfathered" by the 1977 CAA Amendments, to clean up when modernizing or expanding their operations. NSR has been criticized by some in industry and some regulators as being unduly burdensome, complicated and time-consuming.

The United States Environmental Protection Agency (EPA) has begun to institute a series of major changes to NSR with the stated goal of streamlining this program to relieve the regulatory burden on permitted sources of air pollution. The first set of final rules, published on December 31, 2002, addressed five components of the NSR program: (1) baseline actual emissions, (2) actual to projected-actual methodology, (3) plantwide applicability limits (PALs), (4) clean units, and (5) pollution control projects (PCPs) exclusion. This study focuses on the most recent changes, which affect the routine maintenance, repair and replacement (RMRR) exclusion provisions of NSR, referred to as the Equipment Replacement Provision (ERP) rule. EPA has also announced plans to propose additional changes to the NSR program.

The ERP rule, issued on October 23, 2003, would exempt thousands of activities from the NSR program through the RMRR exemption. In effect, the ERP rule eliminates the requirement for old sources to upgrade air pollution controls when modernizing or expanding their operations. This rule allows any activity that does not exceed twenty percent of the replacement value of the process unit to be entirely exempted from the NSR program, regardless of the purpose of the activity. Previously an RMRR exemption was only granted on a case-by-case basis after examining several critical factors. Any activity that would result in an increase in actual emissions was not likely to qualify for an exemption.

The EPA claims that the ERP rule will not adversely affect air quality and will "make the [NSR] program more effective and responsive to today's environmental, economic and energy challenges."[1] While the Northeast states support efforts to reduce unnecessary regulatory requirements on permitted sources of air pollution, such changes must not come at the expense of public health and environmental protection. Evidence indicates that several elements of EPA's NSR changes will, in fact, result in increased emissions that will adversely affect public health and the environment. The environmental commissioners of the New England states asked the Northeast States for Coordinated Air Use Management (NESCAUM)[2] to assess the potential air quality impacts of the ERP rule.

The ERP rule could affect emissions in three important ways: (1) allowing old sources to increase generation and production capacity without having to install state-of-the-art pollution

[1] EPA Press Release. "EPA announces next step to improve the New Source Review program" http://www.epa.gove/newsroom/headline2_082703.htm. August 27, 2003.

[2] NESCAUM is an interstate association of air quality control programs in the Northeast states. The eight member states are comprised of the Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. NESCAUM's purpose is to exchange technical information, and to promote cooperation and coordination of technical and policy issues regarding air quality control among the member states.

controls; (2) reducing state and federal authority to effectively pursue enforcement cases against violators of NSR; and (3) enabling old sources to extend their useful lives. This analysis focuses on the first of these potential affects. However, a discussion of the impact of the ERP rule on NSR enforcement activities and its potential to increase the useful life of old sources is included for perspective.

To quantify potential emission increases that could result from the ERP rule, NESCAUM reviewed publicly available permits, emission inventories, and compliance information to determine *allowable* and *actual* emission levels on a source-by-source basis for 308 facilities, encompassing a range of industrial sectors, in six states. All of these states were found, through state petitions filed under Section 126 of the CAA, to significantly contribute to ozone non-attainment in the Northeast. The analysis focused on Title V sources, which include the nation's largest industrial facilities. The difference between allowable and actual levels represents the emissions increase that could legally occur at each source without any regulatory evaluation, oversight, or additional control requirements under EPA's RMRR rule change.

As shown in Table ES-1, if the 308 facilities evaluated in this study emitted at 85 percent of capacity, their overall carbon monoxide (CO) emissions would increase four-fold, oxides of nitrogen (NO_x) emissions would double, particulate matter (PM_{10}) emissions would increase eleven-fold, sulfur dioxide (SO_2) emissions would more than double, and emissions of volatile organic compounds (VOCs) would more than triple. For each pollutant, the additional emissions from the 308 sources examined in this study would exceed – by several times – the total yearly pollution currently emitted by all of New England's 331 Title V sources before new pollution controls would be required.

Table ES-1. Potential Increase in Emissions at 85% of Emitting Capacity (tons per year)

	CO	NO_x	PM_{10}	SO_2	VOC
308-Facility Emissions at 85% Capacity	142,214	366,892	380,485	3,486,191	92,705
Percent Increase from Current Actual Emissions	397%	95%	1094%	178%	272%
Total Actual Title V Emissions in New England[3]	25,890	79,601	7,590	200,906	12,624

These hypothetical emissions increases do not purport to be an estimate of the actual impact of EPA's NSR changes since it is beyond the scope of this analysis to predict precisely how a variety of industrial sources might respond to EPA's rule changes. However, given that the facilities analyzed in this study represent only 1.8 percent of all Title V sources nationwide, even small increases in emissions could have significant air quality impacts on the New England states. New England's unenviable position at the end of the nation's "tailpipe" will result in the

[3] These numbers are based upon actual emissions from 331 sources as quantified in the 1999 Final National Emissions Inventory, Version 2.

Northeast bearing the brunt of the emission increases that do occur as a result of EPA's NSR changes.

Other air quality programs including the federal Acid Rain program, the NO_x SIP Call and the best available retrofit technology (BART) requirements of the regional haze program are unlikely to effectively protect against the potential emission increases associated with the ERP rule. This is especially true for non-electric generating facilities.

In the early 1990s, EPA began to investigate potential violations of NSR. As a result of these efforts, EPA settled with 27 companies. These settlements required the companies to reduce their emissions by approximately 557,000 tons per year of sulfur dioxide; 242,000 tons per year of nitrogen oxide; and 113,000 tons per year of volatile organic compounds, particulate matter and other pollutants.[4] In addition to the settled suits, EPA has filed ten suits in various courts, filed 47 notices of violation (NOV), and began investigations at 164 electric generating units (EGUs). Studies suggest that if the pending enforcement actions and investigations were settled in a similar manner, SO_2 emissions could be reduced by 3.65 million tons per year. This equates to a thirty-three percent reduction in SO_2 pollution from the entire utility sector.[5] The ability of state and federal enforcement personnel to pursue violations of NSR may be substantially undermined by the relaxation of the criteria used to define routine maintenance by the ERP rule since most of the activities included in the settled or filed cases would have been exempted under the ERP rule.

While impossible to quantify, perhaps the greatest long-term adverse air quality impact of EPA's NSR changes is the fact that they will enable old, high-emitting sources to further extend their productive lives by modernizing without upgrading pollution controls. Subjecting existing sources to NSR when they make major modifications was a result of the "grand bargain" that was struck during the negotiations that led to the passage of the 1977 Clean Air Act Amendments. As the demand for electricity and industrial products grows, companies will look to increase generation capacity and production at those facilities that are least costly to operate. The NSR reform initiative will clearly undermine the intent of Congress by, in essence, permanently exempting "grandfathered" sources from the CAA requirements imposed on newer sources.

While EPA asserts that emissions will not increase (because plants will become more efficient), it has not conducted any concrete analysis using actual facility data to support this conclusion. Further, EPA is unwilling to guarantee this outcome or to provide "backstop" provisions to ensure it. The analysis conducted for this study suggests that actual emissions from existing stationary sources can increase substantially as a consequence of ERP. Long-range transport of air pollution from these upwind sources will make it much more difficult for the New England states to meet the air quality standards required by the Clean Air Act. EPA's modifications to the NSR rule could thus force the New England states to impose further restrictions on their industrial base – which is already more tightly controlled – in order to rectify the air quality degradation created by these modifications.

In order to address the shortcomings of EPA's NSR reform initiative, the New England states should challenge EPA to abandon the ERP rule and replace it with a proposal guaranteed to preserve the public health benefits of the existing NSR program. The states should also

[4] Environmental Integrity Project, *Race to the Top*, page 3.
[5] It is estimated that SO_2 emissions from the utility sector totaled 11.2 million tons in 2000.

continue efforts to challenge implementation of the NSR changes through on-going litigation, fight to maintain current state enforcement programs, and aggressively pursue NSR enforcement cases. In addition to working with the Administration to prevent any weakening of the federal NSR program, the New England states should promote comprehensive national multi-pollutant legislation with emission limits stringent enough to require upwind plants to clean up to at least the Best Available Control Technology (BACT) levels already required in the New England states.

1. Introduction

The New Source Review (NSR) program is a critical component of the Clean Air Act's (CAA's) strategy to control emissions from large industrial sources. The NSR program requires all newly constructed industrial facilities – such as power plants, refineries, and chemical manufacturers – to install state-of-the-art pollution control equipment. Historically, it has also required existing facilities to install modern pollution controls when undertaking major modifications or renovations. For many years, NSR has served as the chief regulatory lever to require old sources, "grandfathered" by the 1977 CAA Amendments, to clean up when modernizing or expanding their operations. NSR has been criticized by some in industry and by some regulators for being unduly burdensome, complicated and time-consuming.

Since its inception, industry has opposed and litigated the NSR program, seeking to limit the ability of regulators to require the addition of pollution controls on existing emission units. In the 1990's, the U.S. Environmental Protection Agency (EPA) began exploring options to reform the NSR program. In 1996, EPA proposed rules that created a menu of options that states could use to streamline the program. However, the proposal was so controversial that EPA took no final rule action at that time. In 2002, EPA resurrected these reforms, revised them, and then released a package of five final rules for mandatory incorporation into state programs. These changes to the NSR program have been applauded by industry and criticized by public health groups, environmentalists and many states. A group of fourteen states has challenged the legality of these rules and litigation is ongoing. EPA has announced plans to propose additional changes to the NSR program in the spring of 2004.

On October 23, 2003, EPA issued another rule that made significant changes to the NSR program. This rule, known as the Equipment Replacement Provision (ERP), would exempt thousands of activities from the NSR program through the routine maintenance, repair and replacement (RMRR) exemption. In effect, the ERP rule eliminates the requirement for old sources to upgrade air pollution controls when modernizing or expanding their operations. This rule allows any activity that does not exceed twenty percent of the replacement value of the modified facility (or "process unit") to be entirely exempted from the NSR program, regardless of the purpose of the activity. Previously an RMRR exemption was only granted on a case-by-case basis after examining several critical factors. Any activity that resulted in an increase in actual emissions was not likely to qualify for an exemption. Industry contended that the lack of clear language defining RMRR exclusions prevented companies from upgrading their facilities. Historically, industry has taken a broad view of what should constitute RMRR, while EPA, until the release of the ERP rule, had interpreted the exemption narrowly. EPA has repeatedly stated that its change in interpretation will have no adverse affects for air quality and will "make the [NSR] program more effective and responsive to today's environmental, economic and energy challenges."[6]

In this study, NESCAUM investigated the potential air quality impacts of EPA's revisions to the RMRR exclusion. The ERP rule could affect emissions in three important

[6] EPA Press Release, "EPA announces next step to improve the New Source Review program," August 27, 2003. See http://www.epa.gov/newsroom/headline2_082703.htm.

ways: (1) allowing old sources to increase generation and production capacity without having to install state-of-the-art pollution controls; (2) reducing state and federal authority to effectively pursue enforcement cases against violators of NSR; and (3) enabling old sources to extend their useful lives. This analysis focuses on the first of these potential effects. However, a discussion of the impact of the ERP rule on NSR enforcement activities and the attendant emission impacts is included for perspective.

The report includes five sections. Section 1 is this introduction. Section 2 provides an overview of the ERP rule and how it changes the traditional approach to determining RMRR exclusions. Section 3 presents the results of the quantitative analysis of the impacts associated with facilities increasing their emissions from current levels to allowable levels under the ERP rule. Section 4 summarizes the other potential emission impacts of EPA's NSR changes including the likelihood that they will extend the life of "grandfathered" sources and the likely impact of the ERP rule on future enforcement actions. This section also includes a summary of other recent studies that have looked at the emission impacts of various elements of EPA's NSR changes. Section 5 provides a summary and recommendations for consideration by the New England states. There are four technical appendices: Appendix A describes the NSR program; Appendix B provides a list of NSR settlements and the attendant emission reductions that will accrue due to these actions; Appendix C provides a list of the unresolved actions related to NSR enforcement; and Appendix D presents the state-specific results of the quantitative analysis of actual versus allowable emissions conducted for this study.

2. The Equipment Replacement Rule

2.1. Background

The EPA has begun to institute a series of major changes to NSR with the stated goal of streamlining this program to relieve the regulatory burden on permitted sources of air pollution. The first set of final rules, published on December 31, 2002, addressed five components of the NSR program: (1) baseline actual emissions, (2) actual to projected-actual methodology, (3) plantwide applicability limits (PALs), (4) clean units, and (5) pollution control projects (PCPs) exclusion. This study focuses on the most recent changes, which affect the routine maintenance, repair and replacement (RMRR) exclusion provisions of NSR, hereafter referred to as the Equipment Replacement Provision (ERP) rule. EPA has announced plans to propose additional changes to the NSR program in the spring of 2004. These proposed changes are expected further reduce the types of activities that may become subject to NSR and therefore result in increased emissions from existing facilities. The proposed rules are likely to focus on de-bottlenecking, project aggregation, and allowable-based PALs.

EPA Acting Administrator Horinko signed the final ERP rule on August 27, 2003, and it was published in the Federal Register on October 27, 2003[7] with an effective date of December 26, 2003. This rule adds an equipment replacement provision to the NSR program. The ERP rule defines what qualifies as an exemption from the NSR program under the RMRR exclusion. Specifically, the rule states that a proposed equipment replacement will be automatically excluded from NSR if the following conditions are met:[8]

- the replacement is identical or functionally equivalent to the existing equipment;
- the replacement has a fixed capital cost of less than twenty percent of the replacement value of the process unit;
- the replacement does not change the basic design parameters of the process unit;
- the replacement does not cause an exceedance of any emissions or operational limit.

If the component replacement cannot be excluded under the ERP rule, the activity can still be exempted under EPA's case-by-case methodology for determining exclusions.

Due to concerns that this rulemaking would adversely affect air quality and public health, fourteen states[9] filed suit to overturn the ERP rule in the Court of Appeals for the D.C. Circuit, in *State of New York v. United States Environmental Protection Agency,* No. 03-1380 filed on October 27, 2003. In response to this action, nine other states[10] intervened

[7] 68 Fed. Reg. 61,248 (Oct. 27, 2003)
[8] 68 Fed. Reg. 61,252 (Oct. 27, 2003)
[9] The fourteen states include California, Connecticut, Illinois, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New Mexico, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin. Several municipalities and environmental organizations have joined the states in this litigation.
[10] The nine states supporting EPA's action on NSR include Alabama, Alaska, Arkansas, Kansas, Nebraska, North Dakota, South Dakota, Utah, and Virginia.

in support of EPA's action. On December 24, 2003, the DC Circuit stayed implementation of the rule. The stay is temporary pending a final decision on this case, which is not anticipated to be reached for two to three years.

2.2. Historical Method for Determining RMRR

In establishing the NSR program, Congress stated that the program required existing facilities to become subject to the program when "any modification" at a stationary source was made. In 1980, however, EPA adopted an exclusion which allowed activities that were RMRR activities to be exempt from undergoing NSR review, an approach that had been adopted earlier in the NSPS program. Prior to the release of the ERP rule, the RMRR exclusion was applied on a case-by-case basis. To determine if an activity was routine, facilities used a four-factor test. Qualifying for exclusion required a case-by-case determination weighing: (1) the nature and extent of the activity, (2) its purpose, (3) the frequency of such activities, and (4) cost of the work, as well as other relevant factors.

Under this case-by-case approach, any activity or modification undertaken by a facility that resulted in an actual emissions increase was not likely to qualify for an RMRR exemption, regardless of its allowable emissions level. Allowable emissions for Title V sources are commonly much greater than actual emissions because the calculation of allowable emission levels under Title V is based on a unit's theoretical potential to emit emission levels (PTE).[11] Allowable and permitted emissions are typically synonymous.

There are several cases that have provided a legal basis for the term routine maintenance. In *Alabama Power Company* v. *Costle*[12] the court found that, "implementation of the statute's definition of 'modification' will undoubtedly prove inconvenient and costly to affected industries, but the clear language of the statute unavoidably imposes those costs except for *de minimis* increases." The ruling goes on to state that, "the provisions concerning modifications indicate that this is not to constitute a perpetual immunity from all standards under the PSD program. If these plants increase pollution, they will generally need a permit. Exceptions to this rule will occur when the increases are *de minimis* and when the increases are offset by contemporaneous decreases of pollutants."

The second, and more important, case relating to the routine maintenance provision was *Wisconsin Electric Power Co. vs. Reilly*[13] otherwise known as the WEPCO decision. One of the many points this case dealt with was the utility's attempt to reverse an EPA decision that the facility's modifications were not routine maintenance and were therefore subject to NSR. The court upheld EPA's use of a multi-factor test to determine if an activity was routine, thereby upholding the "case-by-case determination weighing the nature, extent, purpose, frequency, and cost of the work, as well as other relevant factors."[14] After the WEPCO decision, Congress urged EPA to promulgate rules regarding RMRR. However, EPA did not act until the release of the proposed ERP rule on December 31, 2002.

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[11] Allowable emissions for a source reflect the amount of emissions that it would emit were it to run at maximum capacity, 24 hours per day, 365 days per year, unless specifically constrained or limited by permit conditions.

[12] Alabama Power v. Costle, D.C. Circuit, 1979.

[13] WEPCO v. Reilly, 7th Circuit, 1990.

[14] WEPCO v. Reilly, 893 Fold 901, 910 (7th Circuit, 1990).

2.3. Overview of ERP Rule

The new ERP rule creates a monetary basis for determining what constitutes routine activity and is therefore eligible for the RMRR exclusion. The ERP rule substitutes the traditional four-factor test with a "bright line" approach that exempts any activity under the RMRR exclusion if the following conditions are met:

- it replaces any existing component[15] of a process unit with an identical or functionally equivalent component (i.e., serves the same purpose as the replaced component);
- the fixed capital cost of the replaced component, plus the costs of any repair and maintenance activities that are part of the replacement activity, does not exceed 20 percent of the replacement value of the process unit;
- it does not alter the basic design parameters of the process unit; AND
- it does not cause the unit to exceed any legally enforceable permitted emissions limit or operational limit (that has the effect of constraining emissions).

Under this rule, facilities can still use the case-by-case approach to seek a project exemption if one cannot be obtained using the ERP method.

2.3.1. Functionally Equivalent

To qualify for the RMRR exclusion, the new component must be "functionally equivalent" to the one being replaced. Under the ERP rule, EPA defines the term "functionally equivalent" as any item that is identical or functionally equivalent to the existing component. EPA has stated that a functionally equivalent component "serves the same purpose or function" as the replaced component, but may be "different in some respects or improved in some ways." If a facility must replace the component in order to produce a product that it could not produce with the old unit, it would not be considered functionally equivalent. This definition is vague and ambiguous and authorizes the affected facility to determine whether the replacement component is functionally equivalent.

2.3.2. Replacement Cost

The rule states that the fixed capital cost of the replacement component and any associated maintenance and repair activities must not exceed twenty percent of the process unit's replacement value at the time the replacement takes place. EPA allows the use of any of the following approaches to determine if an activity falls within the twenty percent allowable range:

- the replacement cost (either an estimate of the fixed capital cost of constructing a new process unit or the current appraised value of the process unit);
- the invested cost, adjusted for inflation;
- the insured value, where insurance value covers the complete replacement cost of the process unit; or

[15] EPA states in the preamble (68 FR 61252) that the term "component" is to be interpreted broadly to include replacement of both large components, such as economizers and reheaters at boilers and small items such as screws, washers, and gaskets.

- any other accounting procedure that can be used to establish replacement value of the process unit so long as it follows generally accepted accounting principles.

Replacement value for the process unit can also include equipment purchase, direct installation, site preparation and buildings, indirect installation costs such as engineering fees, land for the process equipment, and working capital for the process equipment. The twenty percent threshold applies on a per-activity basis, and there is no restriction concerning how often such activities may take place. Similarly, there is no specific time period over which the exclusion can only be applied.

The twenty percent criteria will enable facilities to undertake major modifications and expansions without triggering NSR requirements. As discussed later in this report, the "twenty percent" rule would have allowed nearly all of the activities that have been determined in recent enforcement cases to constitute a violation of NSR.

2.3.3. Basic Design Parameters

Basic design parameters (BDPs) are generally design values that relate to process throughput or capacity. In the rule, EPA defines how a source can establish BDPs. For example, at steam electric generating facilities, BDPs are maximum hourly heat input and maximum hourly fuel consumption rate or maximum hourly electric output rate and maximum steam flow rate. For other types of process units, BDPs are maximum rate of fuel or heat input, maximum rate of material input, or maximum rate of product output. The preamble of the rule also states that facilities can define an averaging period for the BDPs. By allowing industry to choose between inputs and outputs, the ERP rule creates a mechanism for facilities to increase production rates and still qualify for the RMRR exclusion. This is often referred to by EPA as allowing industry to increase its efficiency, however, increased efficiency often does not necessarily correlate with lower emissions.

2.3.4. Process Unit

The rule defines a process unit as "any collection of structures and/or equipment that processes, assembles, applies, blends or otherwise uses material inputs to produce or store an intermediate or a completed product." EPA clearly states that pollution control equipment is not part of the process unit, unless it serves the dual function of both process and control equipment. Within the ERP rule, EPA has given specific definitions of process units for several industrial sectors. In many cases, the process unit will include an entire facility and at a minimum will include an entire production line.

2.3.5. Emission Changes

A final, important change in the ERP rule affects the traditional state assessment of whether a facility could qualify for the RMRR exclusion based on the actual-to-potential test. Under ERP, facilities need only remain under their allowable or permitted emissions limit to retain the exclusion. This represents a fundamental shift in policy and provides the legal basis for sources to increase emissions as quantified in this analysis.

The ERP rule is expected to provide companies with the flexibility to modernize and upgrade their facilities without adding modern emission controls. The next sections discuss the potential air quality implications of this rule change.

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3. Quantitative Analysis of the Potential Emissions Impacts of the ERP Rule at Certain Title V Facilities

3.1. Methodology

To quantify potential emission increases that could result from the ERP rule, NESCAUM reviewed publicly available permits, emission inventories, and compliance information to determine *allowable* and *actual* emission levels on a source-by-source basis for 308 facilities, encompassing a range of industrial sectors, in six states. The analysis focused on Title V sources, which include the nation's largest industrial facilities. The difference between allowable and actual levels represents the emissions increase that could legally occur at each source without any regulatory evaluation, oversight, or additional control requirements under EPA's RMRR rule change.

This analysis determined the current "emissions capacity factor" (in terms of emissions, rather than hours of operation) for each facility and the associated "potential emissions capacity factor." The study analyzed emissions to extrapolate increases that would occur should the source's post-RMRR utilization grow from current levels to emission capacity factors of 85 percent and 100 percent. The 85 percent figure provides a plausible emission increase scenario because it represents a reasonable capacity factor at which a plant in "as new" condition (i.e., following refurbishment under the RMRR exemption) could function. The 100 percent figure provides both an absolute upper bound on allowable post-RMRR increases, and more importantly, the level of increased emissions that the source would have to exceed in order to trigger NSR under the ERP rule.

These hypothetical emissions increases do not purport to be an estimate of the actual impact of EPA's NSR changes since it is beyond the scope of this analysis to predict precisely how a variety of industrial sources might respond to EPA's rule changes. On the other hand, the RMRR impacts evaluated here are just one element of several changes in EPA's overall NSR reform package. Other changes, such as baseline modifications, may also lead to emission increases from the permitted sources beyond those analyzed in this study.

3.1.1. Gathering and Analyzing Data

State Selection Process

NESCAUM analyzed data from six states: Indiana, Kentucky, Michigan, New Jersey, Ohio, and West Virginia. Criteria used in selecting the states to evaluate included their potential to impact air quality in New England and the availability of electronic Title V permit data. All of these states were found, through state petitions filed under Section 126 of the CAA, to significantly contribute to ozone non-attainment in the Northeast. Furthermore, these states provided electronic access to their Title V permits, enabling ready access to data.

Obtaining Emission Inventories

Actual emissions information for individual facilities was obtained from the National Emissions Inventory (NEI) database. The NEI is a database of criteria and hazardous air emissions for stationary, mobile, and area sources, developed with input from state and local air agencies, tribes, and industry. EPA prepares this inventory and states review the data for accuracy and completion. When this project commenced, the 1999 NEI Final Version 2.0 was the most recent inventory available for criteria pollutants at stationary sources.

Identifying Sources

To prioritize facility review, NESCAUM ranked facilities according to their emissions of criteria pollutants. The top ten emitters by state were identified for each criteria pollutant. The NEI emissions data was cross-referenced with information from the Title V permits.

Identifying Allowable Emissions

Title V permits were reviewed to identify each facility's plantwide allowable emissions level. Information from Title V or operating permit documents was used to identify all applicable air pollution control requirements for each source. Allowable emission levels are rarely written at a plantwide level; therefore, a facility's plantwide emissions level was established by reviewing all emission units at a facility and summing these limits in an *Excel* spreadsheet. In some cases, a unit did not have an emission limit for some criteria pollutants, most likely because it was not a major emission source for those pollutants.

3.2. Limitations of the Data

Every effort was made to fully evaluate all relevant data to assure the accuracy of the information contained in this report. This section summarizes potential data limitations that could affect results.

3.2.1. National Emission Inventory Data

This project utilized the finalized NEI for Criteria Pollutant Emissions and Stationary Sources – 1999 Version 2.0. The data included in this inventory may not represent actual emissions in 2004. Actual emissions could be underestimated due to a lack of monitoring, a change in determining emission rates, or a failure to include any new process equipment installed after the inventory period. Conversely, actual emissions could be overstated if a facility shut down units after the inventory period, installed new control equipment, changed methods for determining emission rates, or became subject to new requirements.

3.2.2. Allowable Emission Data

Individual facility permits were reviewed to determine allowable emission rates. It is unlikely that allowable emissions levels would be lower than identified in this effort unless a significant modification had been made and the revised permit was not yet publicly available. For a number of reasons, the allowable emission levels for some facilities are higher than

reported in this study. For example, allowable emissions would be higher if all units could not be completely evaluated, if units had no emission limits, or if units had rate-based limits but operational parameters were not provided.

3.3. Types of Facilities Included in the Analysis

A total of 342 permits from the six states were reviewed for this analysis. Data for some pollutants had to be eliminated due to a lack of permit limits or the inability to accurately determine allowable limits. A total of 308 permits had sufficient information to analyze the potential difference between actual and allowable emissions. The number of facilities analyzed for each pollutant is as follows:

- 178 for CO emissions;
- 189 for NO_x emissions;
- 280 for PM emissions;
- 248 for SO_2 emissions; and
- 233 for VOC emissions.

The 308 facilities included in this analysis represent a wide variety of industrial sectors as shown in Table 3-1. Forty percent of the facilities are power plants. The next largest set of sources are primary metal manufacturers, which represent just over ten percent of all facilities evaluated in the study.

Table 3-1. Facility Types Reviewed for This Analysis

Industrial Classification	Indiana	Kentucky	Michigan	New Jersey	Ohio	West Virginia	**Total**
Coal & Metal Mining		3	2		1	12	**17**
Natural Gas Extraction						1	**1**
Food & Kindred Products		5		1	1		**7**
Textiles		1			1		**2**
Apparel Products		1					**1**
Sand Mining		2				8	**10**
Lumber & Wood Products			1				**1**
Furniture & Fixtures		1					**1**
Paper & Allied Products	2	1	4		1	3	**11**
Printing & Publishing		4				2	**6**
Chemical & Allied Products		5	1		4	10	**20**
Petroleum & Coal Products	1	1	2	1	1	2	**8**
Rubber & Misc. Plastic Products		4			2	4	**10**
Stone, Clay & Glass Products	2	4	3	1	3	5	**18**
Primary Metal Manufacturing	5	10	4	3	7	4	**33**
Fabricated Metal Manufacturing			1			11	**12**
Electronics Manufacturing		1					**1**
Transportation Equipment Manufacturing		1	9		5	3	**18**
Misc. Manufacturing		1				1	**2**
Trucking & Warehousing			1	1			**2**
Water Transport		1				1	**2**
Pipelines (except natural gas)				1			**1**
Electronic Power Generation	7	11	12	8	12	75	**125**
Natural Gas Transmission	1						**1**
Incinerators						8	**8**
Landfills						8	**8**
Petroleum Bulk Station & Terminals		1		2	1	2	**6**
Auto Repair, Services & Parking		1					**1**
Hospitals						2	**2**
Educational Institution		4	1				**5**
Correctional Institution		1					**1**
Military Installation				1			**1**
Total							***342***

3.4. Emission Results

Using the methodology described above, the potential increase in emissions that could result from the ERP rule were calculated for a limited set of Title V sources in six states whose emissions have been shown to impact air quality in New England. To put the magnitude of the impacts of the ERP rule into perspective, the results of the analysis of actual to allowable increases at the 308 facilities are compared to actual emissions from all 331 Title V sources in New England. The results for the electric generating units and other industrial facilities are broken out to highlight the fact that the potential for substantial increases in emissions exists for both categories of sources.

Table 3-2 shows the projected emission impacts that would occur if all of the 308 facilities analyzed increased from current levels to 85 percent of capacity. These emissions are compared to those from all Title V sources in the six New England states. As highlighted in the table, the additional emissions of each pollutant from the 308 sources examined in this study would exceed – by several times – the total yearly pollution currently emitted by all of New England's 331 Title V sources before new pollution controls would be required.

Table 3-2. Potential Increase in Emissions at 85% Emitting Capacity (tons per year)

State	CO	NOx	PM10	SO_2	VOC
Kentucky	4,617	16,223	70,674	620,875	1,575
Michigan	11,035	103,930	9,118	87,110	19,096
New Jersey	105,020	139,749	12,674	35,233	55,154
Ohio	5,599	631	66,258	2,098,264	759
West Virginia	15,943	106,359	221,761	644,709	16,121
308 Facility Total	**142,214**	**366,892**	**380,485**	**3,486,191**	**92,705**
% Increase from Current Actual	397%	95%	1094%	178%	272%
Total Title V Emissions in New England[16]	**25,890**	**79,601**	**7,590**	**200,906**	**12,624**

An increase to 85 percent of capacity at all facilities evaluated in this study would increase CO emissions four-fold, double NOx emissions, increase PM_{10} emissions eleven-fold, more than double SO_2 emissions, and more than triple VOC emissions. It is important to note that NOx will likely be the limiting pollutant for increasing collateral emissions of criteria pollutants in the utility sector; however, this is not likely to be the case for all industrial sectors.

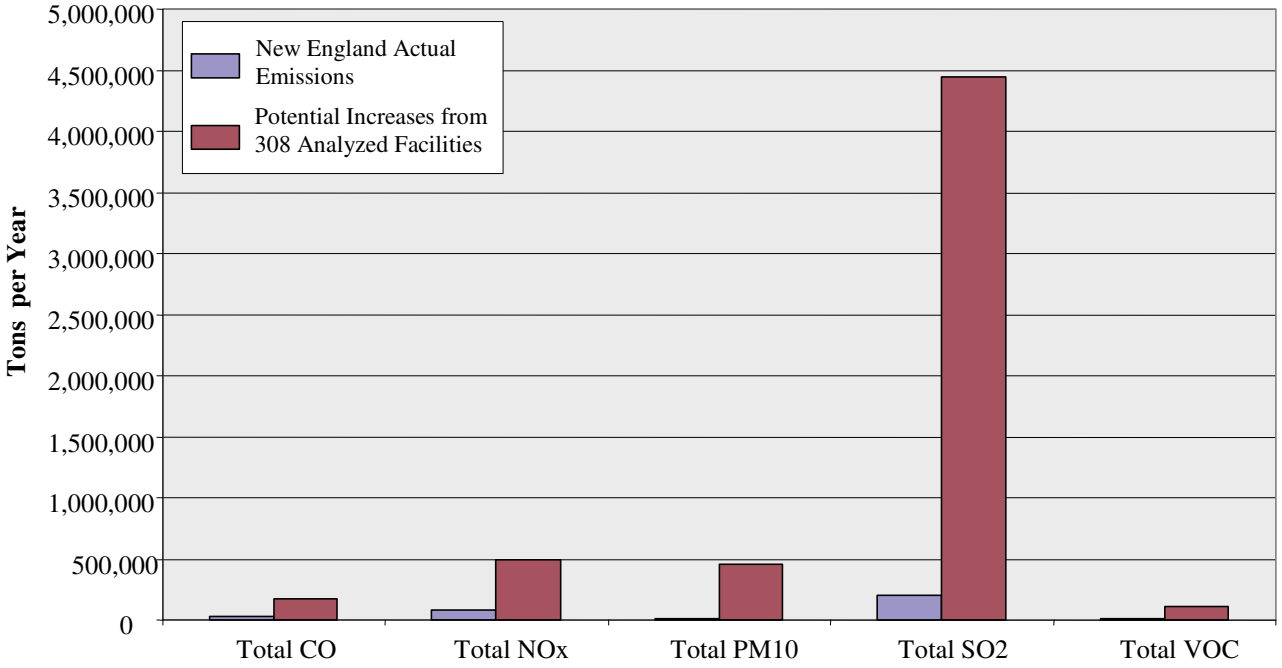
[16] These numbers are based upon actual emissions from 331 sources as quantified in the 1999 Final NEI data, Version 2.

As shown in Table 3-3, and illustrated graphically in Figure 3-1, if these 308 facilities were to increase their emissions from current actual levels to 100 percent of allowable levels, the increase alone would dwarf the total levels currently emitted by all Title V permitted facilities in New England. For example, total actual SO_2 emissions from all of New England's Title V sources are equivalent to less than 5 percent of the potential increase that could legally occur under the ERP rule at just the 308 facilities evaluated. Similarly, total Title V NOx emissions from New England represent just 15 percent of the projected increase for the 308 sources.

Table 3-3. Potential Increase in Emissions at 100% Emitting Capacity (tons per year)

	CO	NOx	PM10	SO_2	VOC
308 Facility Total	**173,634**	**499,631**	**453,763**	**4,446,878**	**115,079**
% Increase from Current Actual	485%	130%	1304%	227%	338%
Total Title V Emissions in New England	**25,890**	**79,601**	**7,590**	**200,906**	**12,624**
New England Total as % of 308 Facility Total	14.9%	15.9%	1.6%	4.5%	10.9%

Figure 3-1. Potential Emissions Increases from 308 Facilities vs. Actual Emissions from All Title V Sources in New England



The above theoretical estimates are conservative in the sense that allowable emission levels from units that had no permit limits were not included. Emissions from these units were only included when the permit provided information to calculate the unit's potential to emit (PTE). When these data were not available, no emission limits were included in the allowable levels.

While it is unlikely that actual emissions will approach the levels indicated by the 100 percent thresholds, it is critical to note that installation of new control equipment will be required only when these levels are exceeded. Given that these facilities represent only 1.8 percent of all Title V sources nationwide, it is evident from the numbers provided above that even small increases in emissions could have significant air quality impacts for the New England states.

3.4.1. Emissions from Non-EGU Sources

The ERP rule's impacts on emissions from EGUs and non-EGUs were also evaluated separately. This analysis was intended to help states better understand whether existing or proposed national programs that primarily target the power sector would leave the opportunity for substantial increases in emissions from industrial sources under EPA's NSR changes. Table 3-4 shows the projected emission impacts that would occur if all of the 183 non-utility sector facilities increased their emissions from current levels to 100 percent of capacity. These emissions are compared to those from all Title V sources in the six New England states.

As highlighted in the table, the 183 non-EGU sources examined in this study could reach four times the level of carbon monoxide, one and one-half times the level of nitrogen oxide, nine times the level of particulate matter, almost three times the total of sulfur dioxide, and eight and one-half times the levels of VOCs currently emitted by all of New England's Title V sources annually (including power plants) before new pollution controls would be required. These results indicate that even if regulations were in place to control emissions from EGUs, potential increases from non-EGUs could still pose a significant threat to New England's air quality.

Table 3-4. Comparison of Potential Increase in the Emissions from 183 Non-EGU Sources vs. All of New England's Title V Sources (tons per year)

Pollutant	Actual Emissions from New England's Title V Facilities	Potential Increase in Emissions from Non-EGU Facilities
Carbon Monoxide	25,980	104,287
Nitrogen Oxides	79,601	119,807
Particulate Matter	7,590	67,604
Sulfur Dioxide	200,906	589,712
Volatile Organic Compounds	12,624	107,291

3.4.2. Emissions from EGU Sources

Table 3-5 highlights the potential increase in emissions from EGU sources versus emissions from all New England Title V sources. For additional perspective, Table 3-6 compares the actual emissions from two of New England's largest EGUs with the potential emission increases from select EGUs in the states examined.

Table 3-5. Comparison of Potential Increase in the Emissions from 125 EGU Sources vs. Actual Emissions from All of New England's Title V Sources (tons per year)

Pollutant	Actual Emissions from all NE Title V facilities	Potential Increase in emissions from EGU facilities
Carbon Monoxide	25,980	69,347
Nitrogen Oxides	79,601	379,826
Particulate Matter	7,590	385,797
Sulfur Dioxide	200,906	3,857,166
VOC	12,624	7,788

Table 3-6. Comparison of Potential Increase in the Emissions from Several EGU Sources vs. Actual Emissions from New England's Largest EGUs (tons per year)

Facility	CO	NO_x	PM10	SO_2	VOC
PSNH / Merrimack (*actual*)	262	7,890	114	34,897	57
USGEN / Brayton Point (*actual*)	1,948	14,562	753	49,037	108
Appalachian Power / Philip Sporn Plant (*potential increase*)	2,884	15,565	2,189	61,878	346
Allegheny Energy Supply / Harrison Plant (*potential increase*)	478	12,503	4,484	129,533	84
Ohio Power Plant (*potential increase*)	4,833	12.209	3,474	497,889	463
Louisville Gas & Electric (*potential increase*)	NA	8,364	2,192	4,998	NA
Cincinnati Gas & Electric (*potential increase*)	NA	NA	7,110	267,948	NA

3.5. Potential of Other Air Quality Control Programs to Limit ERP-Related Emission Increases

Other air quality programs including the federal Acid Rain Program, the NO_x SIP Call and the Best Available Retrofit Technology (BART) requirements of the regional haze program were analyzed to assess their ability to protect against the potential emission increases associated with the ERP rule. While the federal Acid Rain initiative's cap and trade program does limit SO_2 emissions and, to a lesser extent, NOx emission increases from electric utilities, it provides no protection against increased emissions from non-utility sources. The analysis shows that EGUs have significant "head room" that would allow growth in SO_2 emissions. However, SO_2 emission increases are likely to be limited by the amount of "head room" a facility has for NO_x emissions since the average facility increase for SO_2 is 17,931 tpy, but the average facility increase for NO_x is 2,644 tpy. Consequently, from an engineering perspective it is likely that a facility would be more constrained by the NO_x limits in its permits than the Acid Rain Program. Therefore, it is unlikely that the Acid Rain Program will provide an adequate backstop for a relaxation of NSR.

Another program that EPA claims will protect against increased emissions is the NO_x SIP call. The NOx SIP call affects twenty-two jurisdictions in the Eastern U.S. (21 states and the District of Columbia) and will require reductions of one million tons of NO_x during the ozone season. Each of the twenty-two jurisdictions has been allocated a NO_x budget and is allowed to implement this budget in the manner it chooses. States can target specific industries for reductions or they can implement market-based programs. The New England states do not believe this program will provide an adequate backstop against emission increases associated with EPA's NSR changes for several reasons. First, it only applies to sources in a limited number of states. Consequently, for sources in twenty-eight states, the SIP call will have no curtailing effect on the potential to increase emissions. Second, the program applies only during the ozone season. It will not provide any protection against NO_x increases during the non-ozone season. Third, the SIP call only applies to EGUs and large industrial boilers; all other industrial sectors are unaffected by this program. Finally, the program only requires a reduction of one million tons of NO_x annually. This analysis shows that the potential emissions increase from less than 2 percent of the Title V sources could exceed 366,000 tons per years. Extrapolating from this figure, this study would suggest that nationwide, Title V facilities could theoretically increase NO_x emissions by 18,300,000 tons annually. These increased emissions could overwhelm the reductions achieved by the SIP call. For these reasons, the Northeast states believe that the NO_x SIP call will not provide adequate protections against significant emission increases associated with the ERP rule.

Finally, the EPA has suggested that the Best Available Retrofit Technology (BART) requirements of the regional haze program will serve as a backstop. This reasoning, however, is also incorrect. BART only applies to units installed during a specific time period, and whose potential emissions are greater than 250 TPY of a regional haze pollutant[17] and directly contribute to visibility impairment in a Class I national park or wilderness area. Previous analysis conducted by NESCAUM found that only 66 of the 900 Title V facilities

[17] Pollutants covered by the regional haze program include SO_2, NO_X, VOCs, PM_{10} and ammonia.

evaluated would potentially be subject to BART controls.[18] This suggests that only a limited few would be required to install controls as a result of the BART program. Since BART only requires controls to be installed on emission units that were built between 1962 and 1977, BART would never apply to a new piece of equipment that was replaced using the "functionally equivalent" provision. Further, individual states can exempt their eligible sources from BART requirements, if they can demonstrate that those facilities do not contribute to visibility impairment in any Class I national park or wilderness area.

The analysis conducted for this report suggests that significant emissions increases could readily occur under the ERP rule. Furthermore, it is unlikely that other regulatory programs will require a facility to install control equipment as a result of the upgrades. These emission increases could significantly impact air quality in the New England states given that a majority of these sources are upwind of our region. Without adequate backstops or significant additional controls on other in-region sources, it is likely that air quality and public health in New England will be adversely affected by the ERP provisions of NSR reform.

[18] NESCAUM, MANE-VU Technical Memorandum #6. Development of a List of BART-Eligible Sources in the MANE-VU Region: Interim Report. May 2003

4. Other Air Quality Impacts of NSR Reform

4.1. Extending the Life of "Grandfathered" Facilities

While impossible to quantify, perhaps the greatest long-term adverse air quality impact of the NSR reform effort will result from the fact that these changes enable old, high emitting sources to further extend their useful lives. The ERP rule will allow these facilities to modernize and increase generation and production without also upgrading pollution controls. There is an economic incentive to boost generation or production at these facilities since they are largely depreciated and are less costly to operate because they do not have to comply with the same environmental regulations as newer plants.

A primary goal of the CAA's NSR requirements was to create a technology-forcing program that would increase the use of air pollution control technology over time. The economic and practical difficulties of retrofitting older plants with modern pollution control equipment and the argument that these facilities were nearing the end of their useful lives led Congress to "grandfather" these sources from clean air requirements. However, Congress did not permanently exempt these sources. As the courts have recognized, the structure of the CAA reflects that grandfathering was envisioned as a temporary, rather than a permanent status. Existing plants were required to modernize air pollution controls whenever they were modified in ways that resulted in increased emissions.[19]

The NSR reform initiative will clearly undermine the intent of Congress by, in essence, permanently exempting "grandfathered" sources from the CAA requirements imposed on newer sources. As the demand for electricity and industrial products grows, companies will look to increase generation capacity and production at those facilities that are least costly to operate. These economic decisions will have important long-term adverse environmental and public health impacts.

4.2. Impact on ERP Rule on Enforcement Cases

4.2.1. Enforcement History

In the early 1990s, EPA began to investigate potential violations of NSR. Before this time, only a handful of cases had been pursued under this rule. In 1996, EPA and several states invested significant resources toward NSR/PSD enforcement efforts, focusing primarily on the utility sector. Soon after, investigation of other industrial sectors including petroleum refineries, chemical manufacturers, pulp and paper mills and steel manufacturing began. In the course of these enforcement efforts, EPA settled with 27 companies. These settlements required the companies to reduce their emissions by approximately 557,000 tons per year of sulfur dioxide; 242,000 tons per year of nitrogen oxide; and 113,000 tons per year of volatile organic compounds, particulate matter and other pollutants.[20] In addition to the settled suits, EPA has filed ten lawsuits in various courts, filed 47 notices of violation (NOV), and begun investigations at 164 electric generating units (EGUs). Analysis

[19] *WEPCO*, 893 F.2d at 909

[20] Environmental Integrity Project, *Race to the Top*, page 3.

conducted by the Environmental Integrity Project (EIP) estimates that if the pending enforcement actions and investigations were settled in a similar manner, SO_2 emissions could be reduced by 3.65 million tons per year. This equates to a thirty-three percent reduction in SO_2 pollution from the entire utility sector.[21] By comparison, stricter legislation in the states of Maryland, Michigan, Illinois, Delaware, Iowa, Pennsylvania, and Wisconsin has the potential to reduce 1.44 million tons of SO_2; and only 0.6 million tons of SO_2 will have been reduced by the federal Acid Rain Program by 2013.[22]

After release of the ERP rule, EPA reversed course on NSR/PSD enforcement. On November 4, 2003, then-EPA Assistant Administrator for Enforcement, John Peter Suarez, notified agency staff that EPA would not file any NSR complaints against the facilities that had received NOVs. However, that decision appears to have been reversed since the court's stay of the rule. On January 21, 2004, EPA Administrator Mike Leavitt announced plans to pursue additional NSR enforcement actions. Since that time, EPA has filed suit against one company (Eastern Kentucky Power Cooperative), filed NOVs against two companies (Mirant and Westar) and started investigations against two companies (Louisiana Generating and the Salt River Project). In March 2004, EPA settled the Santee Cooper case with the South Carolina Public Service Company, but the New England states question the veracity of the terms of that settlement.[23] At this time, it is unclear whether EPA is using the narrow interpretation of RMRR or the new ERP as the basis for judging these cases. The decision as to which interpretation applies is critical since analysis conducted by various states has shown that the previous NSR victories would not have been possible under the new rules.

4.2.2. Example of the Impact of ERP Rule on Enforcement

As an example of how the ERP rule may affect future enforcement cases, one state examined the impact of the new rules on the settled VEPCO Mt. Storm facility.[24] This facility settled in April 2003 and agreed to spend $1.2 billion through 2013 to install state-of-the-art pollution controls. As a result of this action, the facility will reduce annual emissions by approximately 176,500 tons of sulfur dioxide and 60,400 tons nitrogen oxide from eight coal-fired EGUs in Virginia and West Virginia. The facility also agreed to retire 45,000 sulfur dioxide allowances by 2012. The facility also agreed to pay a civil penalty of $5.3 million to fund environmental projects in the Connecticut, New Jersey and New York. Table 4-1, below, shows that under the ERP provision's 20 percent rule, the company would have been allowed to undertake all the activities that led to the violation without installing control equipment.

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[21] It is estimated that SO_2 emissions from the utility sector totaled 11.2 million tons in 2000.

[22] Environmental Integrity Project, *Race to the Top,* page 16.

[23] USA and South Carolina Department of Health and Environmental Control v. South Carolina Public Service Authority, http://www.epa.gov/compliance/resources/decrees/civil/caa/santee-cd.pdf.

[24] Data provided by New Jersey from the affidavit of Ketan Bhandutia.

Table 4-1. VEPCO Mt. Storm Actions Settled with EPA, April 2003

Activity	Unit Replacement Cost (1)	Upgrade Cost (at time of activity) (2)	Upgrade Cost (2001 Dollars) (3)	Project Exemption Level under ERP
Turbine modification - Unit #1[25]	$513 million ($900/KW)	$8,360,642 (1985-86)	$13,978,433	$102.6 million
Turbine modification - Unit #2[26]	$513 million ($900/KW)	$8,325,790 (1985-86)	$13,920,163	$102.6 million
Coal yard improvement project	$513 million ($900/KW)	$23,375,281 (1985-86)	$39,081,903	$102.6 million

(1) The unit replacement cost is derived from the Utility Air Regulatory Group's (UARG's) comments to EPA dated May 2, 2003, entitled "A Methodology to Evaluate the Replacement Cost for Coal-fired and Gas-fired Power Plants."

(2) *Year(s) and cost of equipment replacement is taken from the complaint filed by New York on July 20, 2000 in State of New York vs. Virginia Electric & Power Company, No 00 Civ.5396 (S.D.N.Y.) and from the Federal Energy Regulatory Commission (FERC) Form No. 1 filings of the company.*

(3) *The cost for each equipment replacement was converted to 2001 dollars using the Consumer Price Index (All Urban Consumer, Series CUUROOOOSAO), available at http://data.bls.gov/servlet/surveyoutputservlet.*

This case is not unique. In fact, most of the activities included in the settled or filed cases would have been exempted under the ERP rule. This example highlights the important implications of this element of the NSR reform package and demonstrates that significant changes to facilities will now be allowed that will result in real emission increases.

Of further concern is the fact that under EPA's new ERP rule, the responsibility for determining ERP applicability will reside with the source rather than with state permitting authorities, and sources will be under no obligation to retain the documentation used to reach a determination. The absence of such records will make subsequent compliance assurance and enforcement, where warranted, virtually impossible.

4.3. Other Studies of the Impacts of NSR Changes

Several other studies of the impacts of certain aspects of EPA's NSR reform initiative have been conducted. This section summarizes the key findings of some these reports.

4.3.1. Environmental Integrity Project: *Reform or Rollback*

The Environmental Integrity Project (EIP), in conjunction with Council of State Governments/Eastern Regional Conference, produced a report in 2003 entitled *Reform or Rollback: How EPA's Changes to the New Source Review Could Affect Air Pollution in 12 States*. This study assessed the potential impact of EPA's NSR reform regarding baseline emission calculations. The study evaluated emissions and permit data for twelve states: Connecticut, Delaware, Florida, Illinois, Indiana, Louisiana, Maine, New Jersey, New York,

[25] Modernized low pressure turbine. Activities included installing redesigned rotor, replacing turbine inner cylinder, and correcting turbine water induction problem.

[26] Modernized low pressure turbine. Activities included installing redesigned rotor, replacing turbine inner cylinder, and correcting turbine water induction problem.

Pennsylvania, Vermont, and Wisconsin. This study found that changes to baseline emissions calculations could result in significant emission increases. Average increases above 1999 levels for the twelve states are projected as follows:

- 36 percent increases in carbon monoxide emissions;
- 14 percent increase in nitrogen oxides emissions;
- 14 percent increases in particulate matter emissions;
- 6 percent increase in sulfur dioxide emission; and
- 37 percent increase in volatile organic compound emissions.

The study also concluded that other regulations such as those required by SIPs, NESHAP, NSPS, Regional Haze and Acid Rain programs will not fully protect against emission increases that could legally occur under NSR reform.

4.3.2. Government Accounting Office – Report on Effects of Revisions to the New Source Review Program, August 2003

This Government Accounting Office (GAO) report reviewed the two conclusions reached in its analysis of the first set of changes to the NSR program. Specifically, the report reviewed EPA's conclusions that the rule's economic impact did not merit a detailed analysis, and that the NSR program, prior to the changes, discouraged energy efficiency projects. GAO found that there was inadequate data about the rules impacts, and that EPA relied on anecdotal data that did "not represent the program's effects across the industries subject to the program." The GAO recommended that EPA determine what data are available to monitor the effects of the rule changes, identify additional data needs and ways to fulfill them, and use monitoring results to identify adverse impacts of the rule changes.

4.3.3. Government Accounting Office – Stakeholders Survey, February 2004

GAO developed a report that detailed stakeholders' opinions of the NSR revisions. GAO obtained responses from 44 states, 6 environmental/health groups, and 8 industry groups. The survey found that, by and large, both state agencies and the environmental community believe that NSR reform will create an environment where industry can make changes to their facilities without permit review or the need to install control equipment. Specifically, the report found that a majority of state agency respondents felt that the NSR changes would:

- reduce the number of permits issued;
- reduce the installation of pollution controls and lower-emitting technologies; and
- increase workloads for environmental agencies.

Industry respondents felt that changes to the NSR program would:

- reduce the number of permits issued;
- increase industrial efficiency; and
- decrease workloads for environmental agencies.

EPA disagreed with GAO's survey methods and results.

5. Conclusions and Recommendations

5.1. Conclusions

During the reauthorization of the Clean Air Act in 1977, Congress placed particular emphasis on reducing emissions from power plants and other large industrial facilities. Utilities argued that installing pollution controls on plants that would soon be retired was cost-prohibitive (due to less time for amortization). So a "grand bargain" was struck – called "New Source Review" – whereby new plants would have to be much cleaner, but existing facilities would be left alone, or "grandfathered," unless they undertook significant modifications or expansion. For many years, NSR has served as the primary mechanism for controlling air pollution from industrial sources. It has been the chief regulatory lever to ensure that grandfathered sources add pollution controls when they modernize or expand their operations. NSR has been criticized by some in industry and by some regulators, charged with implementing the program, for being unduly burdensome, complicated and time-consuming.

EPA has initiated a major overhaul of the New Source Review program. As part of its NSR reform effort, on October 27, 2003, EPA published the ERP Rule, which exempts any activity at a permitted facility from undergoing environmental review if it: (1) involves replacing equipment that is "functionally equivalent;"[27] (2) costs less than twenty percent of the replacement value[28] of the process unit;[29] (3) does not change the basic design parameters of the process unit; and (4) does not cause an exceedance of any permitted emissions limit. While the EPA has marketed its NSR reforms as improving regulatory efficiency and reducing pollution, there is little evidence to support this conclusion. The debate around the ERP rule focuses on whether the more than18,000 existing Title V facilities, which collectively release millions of tons of pollutants into the atmosphere annually, will need to install modern pollution controls when making significant modifications.

The ERP rule could affect emissions in three important ways: (1) allowing old sources to increase generation or production capacity without having to install state-of-the-art pollution controls; (2) enabling old sources to extend their useful lives; and (3) reducing state and federal authority to effectively pursue enforcement cases against violators of NSR. Evidence indicates that other aspects of EPA's NSR reform initiative, such as changes to the way baseline emissions for facilities are calculated, are also likely to result in increased emissions from Title V sources.

While EPA asserts that emissions will not increase because plants will become more efficient, it has not conducted any concrete analysis using actual facility data to substantiate this conclusion. Further, EPA is unwilling to guarantee this outcome or to provide "backstop" provisions to ensure it. The analysis conducted for this study suggests that actual

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[27] "Functionally equivalent" does not necessarily mean replacement with exactly the same piece of equipment. Replacement equipment could increase production efficiencies that would result in increased emissions, but still be considered functionally equivalent.

[28] There is no time period limit for using this exclusion allowance; therefore, a facility could undertake multiple projects within the same year.

[29] "Process unit" can be interpreted to include the entire facility. Applying this interpretation would creates a larger denominator, thus allowing for a larger exclusion allowance.

emissions from existing stationary sources can increase substantially as a consequence of ERP. Specifically this report finds that:

- Under the ERP rule, before pollution control technology would be required, emissions could increase by almost 600 percent for carbon monoxide; 130 percent for nitrogen oxides; 1304 percent for fine particulate matter; 227 percent for sulfur dioxide; 338 percent for volatile organic compounds.

- The potential emissions increases from just the 308 upwind sources examined in this study (which represent only 1.8 percent of U.S. Title V sources) could reach several times the total annual pollution currently emitted by all 331 Title V sources in New England before new pollution controls would be required.

- Other regulatory programs will not provide a meaningful backstop against the emissions increases that could occur due to changes in the NSR program, especially from non-EGU sources.

- Increased long-range transport of air pollution resulting from increased emissions at upwind sources will make it much more difficult for the New England states to meet air quality standards as required by the Clean Air Act.

- New England's unenviable position at the end of the nation's "tailpipe" will result in its bearing the brunt of the emissions increases that do occur as a result of NSR reform.

- The ability of state and federal enforcement personnel to pursue violations of NSR may be substantially undermined by the relaxation of the criteria used to define routine maintenance by the ERP rule.

- The recent NSR reform package will likely further extend the life of old, high-emitting industrial facilities that were originally "grandfathered" under the 1977 CAA under the assumption that they were nearing retirement.

- EPA's rule changes to NSR could force the New England states to impose further restrictions on their industrial base – which is already more tightly controlled – in order to rectify the air quality degradation created by these changes.

- EPA's NSR reforms will result in a more complex – rather than simplified – enforcement and compliance program and will require more resources in order for states and EPA to implement and enforce.

5.2. Recommendations

In order to address the shortcomings of EPA's NSR reform initiative, the New England states should:

- Challenge EPA to abandon the ERP rule and replace it with a proposal for NSR reform that preserves the public health and air quality benefits of the existing NSR program.

- Continue efforts to challenge implementation of the NSR changes through on-going litigation.

- Continue to aggressively pursue NSR enforcement cases.

- Work at the highest levels within the Administration to prevent any weakening of the federal NSR program.

- Push for comprehensive national multi-pollutant legislation with emission limits stringent enough to require upwind plants to clean up to at least the Best Available Control Technology (BACT) levels already required in the New England states.

- Fight to maintain current, more stringent state enforcement programs.

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Appendix A: Overview of the NSR Program

NSR is a permitting program that applies to new or modified units at major stationary sources of criteria air pollutants[30] regulated under the Title I, Parts C and D of the Clean Air Act (CAA). The NSR program has two parts: the Prevention of Significant Deterioration (PSD) program and the non-attainment New Source Review program. The PSD program is for geographic areas that meet national ambient air quality standards (NAAQS). The goal of the PSD program is to ensure that emissions from new or modified sources do not degrade air quality. PSD applies to sources in twenty-eight categories that have the potential to emit more than 100 tons per year and any other source with the potential to emit more than 250 tons per year of a regulated pollutant. The non-attainment NSR program applies in areas that do not meet the NAAQS. The goal of the non-attainment NSR is to regulate emissions from new or modified sources in order to improve ambient air quality. For non-attainment areas, a major source is one that has the potential to emit more than 100 tons per year of a pollutant contributing to non-attainment, with lower thresholds for sources of VOCs, carbon monoxide (CO), NOx and particulate matter (PM), depending on the level of ozone non-attainment (e.g., moderate, serious, severe, or extreme). Implementation of both NSR programs is on a pollutant-specific basis. Therefore, a facility could be subject to both PSD and non-attainment NSR.

NSR only affects existing sources when they undergo a major modification. Both PSD and non-attainment NSR programs define a major modification as any change that would result in a significant net emissions increase of a regulated pollutant. Making existing sources subject to NSR when they make major modifications was a result of the "grand bargain" that was struck during the negotiations that led to the passage of the 1977 Clean Air Act Amendments. At that time, industry argued that it did not make sense to apply expensive pollution control requirements to plants that were on the verge of retirement. In addition, they argued that the most cost-effective time to add controls was when a facility was undergoing a modification to the plant. Lawmakers agreed to exempt these old facilities from the strict controls imposed on new sources, with one important caveat: if a company made new investments in an old facility – investments that could enhance capacity or extend operating life – the old source would be subject to NSR. Generally, this meant that such facilities would have to install modern pollution controls. This allowance granted older, more polluting units a valuable asset – the right to pollute at pre-1977 levels. Given this competitive advantage, these facilities have been kept online far longer than most anticipated in the 1970's. Many of the older facilities grandfathered in 1977 are still in operation and often emit pollution at rates more than *ten times* higher than their modern counterparts. In fact, many of these units are so old that they have no emission limits at all. In the quarter century since the passage of the 1977 amendments of CAA, the NSR backstop provided a limited but crucial tool to upgrade pollution controls on these old plants.

Between the mid-1990s and early 2000s, EPA and the Justice Department initiated enforcement actions against several companies for NSR violations. In many cases, EPA found that major modifications had been inappropriately classified as routine maintenance to avoid triggering NSR requirements, resulting in tens of thousands of tons of excess pollution. In

[30] The six criteria pollutants regulated under NSR include Carbon Monoxide (CO), Nitrogen Dioxide (NO_x), Ozone (O_3), Lead (Pb), Particulate Emissions (PM_{10}), and Sulfur Dioxide (SO_2)

addition, a number of Northeast states initiated their own NSR lawsuits. These lawsuits have resulted in settlement agreements with several major utility companies (a complete list of NSR settlements can be found in Appendix B). The California electricity crisis in late 2000 and early 2001, and resulting concerns about the adequacy of the nation's energy supply, led to renewed scrutiny of NSR. In a May 2001 report, the National Energy Task Force called on EPA to review the existing NSR program and on the Justice Department to review the 51 lawsuits then pending against NSR violators. Following this review, several important final rules have been released with additional action anticipated during 2004.

A.1 EPA Actions on NSR

December 31, 2002 Final Rule Changes

The first set of final rules, published on December 31, 2002, addressed five components of the NSR program: (1) baseline actual emissions, (2) actual-to-projected-actual methodology, (3) plantwide applicability limits (PALs), (4) clean units, and (5) pollution control projects (PCPs) exclusion. The final rules announced by EPA make five major changes to NSR. The new rules are summarized below.

- *Baseline Actual Emissions*: This rule changes the way "baseline" emissions are determined. Prior to this rule a facility had to use the average of the last two years' actual emissions for its baseline, unless the facility could prove to a permitting agency that a different period would be more representative. Under the new rule, a facility can pick any 24-month period in the last ten years without any review or approval by the permitting authority.
- *Actual to Projected-Actual Test*: This rule changed they method that facilities use to calculate how emissions will change when they make a modification. The new rules allow companies to compare "baseline actual emissions" (determined based on any 24 month period in the last ten years) to the level of emissions they believe they will occur in the future after the modification. The future actual limit is not an enforceable limit and the source may use any calculation methodology it wishes. There are no ramifications for guessing inaccurately or for using imprecise methods. Under the old NSR rules, sources had to compare actual emissions for the last two years to the potential emissions that could result after the after the modification was made. This was known as the actual-to-potential test.
- *Plantwide Applicability Limits (PAL)*: The PAL provision allows a facility to avoid NSR for individual units (e.g., boilers) within their facility by accepting a facility-wide, pollutant-specific cap. This rule creates a slightly different baseline measurement for establishing a PAL, and a facility can use different baselines for different pollutants. The cap set by a PAL lasts ten years, at which time a facility can renew or eliminate the PAL.
- *Clean Unit Exemption*: This rule creates a "clean unit exemption" that automatically exempts the unit from undergoing any NSR review for a period of 10 years after it installs BACT or comparable equivalent controls on an emissions unit.

- *Pollution Control Project (PCP) Exclusion*: This rule creates an automatic exemption from NSR for an expanded array of projects that can be claimed to have net emissions reduction or pollution prevention benefits, while deleting a requirement that such projects must be shown to be environmentally beneficial, and disregards any cross media transfers or increase in other air emissions.

October 27, 2003 Equipment Replacement Provision Rule

The EPA's changes to the NSR routine maintenance, repair, and replacement provisions were incorporated into the Equipment Replacement Provision (ERP) rule it adopted on October 27, 2003. The ERP is the principal topic of this analysis. A thorough discussion of this rule change can be found in Section 2.

Further Rulemaking

EPA has announced plans to propose additional changes to the NSR program in the spring of 2004. These proposals may further reduce the number and type of activities subject to NSR and may therefore result in increased emissions. The proposed rules are expected to focus on three areas: de-bottlenecking, project aggregation, and allowable-based PALs. All of these changes are likely to lead to increased emissions.

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Appendix B: NSR Settlements

NSR Enforcement Settlements Overview[31]

Company	SO_2 Reduced (annual tons)	NO_x reduced (annual tons)	VOC/PM/Other (annual tons)	Settlement Date
ADM			63,000	April 2003
Alcoa	52,000	15,000		April 2003
Boise Cascade			2,166	March 2002
BP	19,600	18,300	10,000	Jan 2001
Chevron USA	6,300	3,300		Oct. 2003
Coastal Eagle Point	2,800	1,100		Oct. 2003
Conoco	3,000	4,000	500	Dec 2001
Dominion VA Power	191,210	65,726		April 2003
Koch	5,200			Dec 2000
Lion Oil	650	530	200	March 2003
Lovett	2,000	3,225		June 2003
Marathon	12,800	8,000		May 2001
Martin's Creek	20,000			June 2003
Motiva	50,000	8,000	1,300	March 2001
Murphy Oil	Unspecified	Unspecified	Unspecified	March 2002
Navajo	2,350	250	100	Dec 2001
Nucor		6,800	3,000	Dec 2000
Premcor	4,700	270	630	July 2001
PSE&G	36,000	18,000		Jan 2002
SIGECO	6,500	4,000		June 2003
Tampa Electric	70,000	53,000		Feb 2000
Willamette			27,000	July 2000
Wisconsin Electric	72,300	32,600	Unspecified	April 2003
12 Ethanol Producers		180	5,100	Oct 2002
TOTALS	**557,410**	**242,281**	**112,996**	

[31] Taken from the Environmental Integrity Report report *Race to the Top.*

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Appendix C: Unresolved Action on NSR Enforcement

Pending Lawsuits

Case	Plant	Court
US v. Illinois Power & Dynegy Midwest Generation	Baldwin Station, IL	S.D. IL
US v. Cinegy	Cayuga (IN) Gallagher (IN) Wabash River (OH) Beckjord (OH)	S.D. IL
US & States of NY, NJ, CT, MA, VT, NH, RI, MD v. American Electric Power (consolidated with Ohio Citizens Action, et al v. American Electric Power Service Corp et al)	Tanner Creek (IN) Cardinal (OH) Conesville (OH) Mukingham River (OH) John E. Amos (WV) Kammer (WV) Kahawaha River (WV) Mitchell (WV) Phillip Sporn (WV) Clinch River (VA)	S.D. OH
US & State of NY, NJ and CT v. Ohio Edison et al	Sammis Station (OH)	S.D. OH
US v Georgia Power Co. and Savannah Electric & Power Co.	Bowen (GA) Scherer (GA) Kraft (GA)	N.D. GA
US v Alabama Power Co.	Barry (AL) Gaston (AL) Gorgas (AL) Green (AL) Miller (AL)	ND. AL
US v Duke Energy	CG Allen (NC) Belewes Creek (NC) Buck (NC) Marshall (NC) Cliffside (NC) Dan River (NC) WS Lee (SC) Riverhead (NC)	M.D. NC
TVA et al v. Whitman	Paradise (KY) Colbert (AL) Allen (TN) John Sevier (TN) Cumberland (TN) Bull Run (TN) Kingston (TN) Shawnee (TN)	11th Circuit
Eastern Kentucky Power	Dale (KY) Spurlock (KY)	S.D. KY

Facilities with Outstanding Notices of Violation

Company	Facility	Date NOV Issued
Aluminum Casting and Engineering Co	Milwaukee, WI	1/15/2003
Aztec Peroxides	Organic Peroxide Plant, Elyria, OH	9/26/2001
Buckeye Egg Farm	Three chicken production plants in Croton, Mt Vickory, Harpster, OH	1/19/2001
Cargill, Inc.	Grain processing, Lafayette, IN	5/2/2002
Caribbean Petroleum Refinery	Bayamon Refinery, PR	10/8/1999
Cenex Harvest States Cooperative	Grain processing, Mankato, MN	1/15/2003
Central Soya Company, Inc.	Grain processing; Gibson City, IL	2/13/2003
Citgo Petroleum Corp	Refinery; Lake Charles, LA	1/19/2001
	Refinery; Corpus Christie, TX	1/19/2001
	Lemont, IL	3/17/1998
		6/28/1999
		3/22/2000
Countrymark Cooperative	Mount Vernon, IN	3/25/1999
Dayton Power & Light	J.M. Stuart, OH	6/30/2000
Diversified Panel Systems	Polystyrene Foam Prod., Venture City, CA	9/20/2001
Dixon Marquette	Portland cement plant	3/20/2003
East Dominance Industries, Inc	Med. Density fiberboard plant Broken Bow, OK	2/5/2001
Dupont	Fort Hill Sulfuric Acid Plant; North Bend, OH	6/25/2003
Essroc, Inc	Portland Cement Plant; Logansport, IN	7/9/2003
Exxon Mobil Oil	Joliet, IL	8/20/2002
Exxon Mobil	Paulsboro, NJ	1/29/2001
Exxon Mobil Oil	Refinery; Beaumont, TX	12/20/2001
Exxon Mobil Oil	Refinery; Baytown, TX	8/20/2002
Guy Chaddock & Co	Furniture Mfg.; Bakersfield, CA	10/26/2001
Illinois Cement Co.	Lasalle, IL	2/26/2003
IMCO Recycling	Alchem Aluminum and IMCO Recycling facility; Coldwater, MI	4/27/2001
International Mill Service, Inc	U.S. Steel Gary Works, IN	1/10/2002
		3/10/2003
Johns Manville	Johns Manville Plant #1, Waterville OH	5/10/2002
Kennecott Greens Creek Mining Co.	Metallic Mineral Mining Plant	5/22/2001
Kerr McGee Corp	Inorganic Chem. Manufacturing, Henderson, NV	9/28/2001
Lyondell-Citgo	Refinery; Houston, TX	1/18/2001
Minnekota Power Cooperative, Inc	Milton R. Young Station, ND	6/17/2002
Mirant	Potomac River	1/26/2004
Mobil Exploration & Production, Inc	Navajo Indian Reservation	7/8/2001
Mobil Oil	Joliet, IL	8/30/2002
Modesto Irrigation District	Woodland Generating Station, Modesto, CA	8/13/1999
Phillips Petroleum	Refinery; Borger, OK	2/27/1998
Phillips Petroleum	Refinery; Woods Cross, TX	2/25/1999
Phillips Puerto Rico Core	Guayama, PR	1/22/1999
Prentice Hall Corp. System	Unit No B-3401; Topeka, KS	5/5/1998
Puerto Rico Electric Power Authority	Cambalache Electric Generating Station, PR	5/24/1999
Steel Dynamics, Inc	Columbia City, IN	2/15/2001
Steel Dynamics, Inc	Steel Mini-Mill; Butler, IN	9/26/2001
Stora-Enso Niagara Mill	Niagara Pulp Mill, WI	2/25/2003
Sun Refining and Marketing	Oregon, OH	12/19/2001
Sunoco, Inc	Marcus Hook, PA	12/20/2001
Texaco Exploration and Production, Inc	Crude Oil Production wells, Kern County, CA	6/12/2001
Turlock Irrigation District	Almond Power Plant, CA	8/13/1999

Company	Facility	Date NOV Issued
United Refining	Warren, PA	6/24/1998
		10/19/2000
Westar	Jeffery Energy Center	1/26/2004
Xcel Energy	Pawnee station, Morgan County, CO	6/26/2002
	Comanche Station, Pueblo County, CO	6/26/2002

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Appendix D: State-Specific Results of the Analysis of Actual versus Allowable Emissions

The information in this appendix provides summary data for each of the six states regarding the types of facility permits analyzed and the potential emission increases that could theoretically occur as a result of the changes to NSR through the ERP rule before additional emission controls would be required.

Indiana

This project reviewed eighteen of the 2,090 Title V sources in Indiana. The 18 facilities evaluated included:

- 7 electric power generating facility
- 5 primary metal manufacturing facilities
- 2 paper manufacturing facility
- 2 stone, clay, & glass manufacturing facilities
- 1 natural gas transmission facility
- 1 petroleum & coal products facility

Due to a lack of data within the Title V permits, we were unable to calculate specific potential emission increases for the facilities in Indiana. However, information on specific pollutants and their associated limits is provided for context.

Carbon Monoxide

The median actual CO emissions from the eighteen facilities examined were 1,123 tpy and the average was 10,943 tpy. The total actual annual emissions from the eighteen facilities were 196,969 tpy. Of the facilities analyzed, two had CO emission limits on most units. Three facilities had emission limits on some units such that actual emissions far exceed permitted levels. Thirteen facilities did not have any CO limits on any unit within the facility. Of the thirteen facilities with no CO limits, ten emit CO at major source levels. Actual annual emissions for these ten sources ranged from 318 to 89,928 tons per year.

NO_X

The median actual NO_x emissions from the eighteen facilities examined was 4,165 tpy and average emissions were 8,962 tpy. Total actual annual emissions from the eighteen facilities were 161,311 tpy. Of these, one facility had NO_x emission limits on most units. Seven facilities had emission limits only on some units such that actual emissions far exceed permitted levels. Ten did not have any NO_x limits on any unit within the facility. Of the ten facilities with no NO_x limits, four emit NO_x at major source levels. Actual annual emissions for these four sources ranged from 6,923 tons per year to 49,450 tons per year.

Particulate Matter

The median actual PM emissions from the eighteen facilities examined were 483 tpy and average emissions were 937 tpy. Total actual annual emissions from all facilities were 16,874 tpy. Of the eighteen facilities analyzed, nine facilities had PM emission limits on most units. Five facilities had no PM emission limits on any unit. Of those five facilities with no PM limits, two emit PM at major source levels. Actual annual emissions for these two sources were 404 and 1,234 tons per year.

Sulfur Dioxide

The median actual SO_2 emissions from the eighteen facilities examined was 5,217 tpy and average emissions were 26,579 tpy. Total actual annual emissions from these facilities were 487,416 tpy. Five facilities had SO_2 emission limits on most units and six facilities had emission limits on some units. Of the seven facilities with no SO_2 limits, one emits SO_2 at major source levels.

VOC

The median actual VOC emissions from the eighteen facilities examined was 225 tpy and average emissions were 559 tpy. Total actual annual emissions from all facilities were 10,062 tpy. Of the eighteen facilities analyzed, one had VOC limits on most units; six had emission limits on some units such that actual emissions far exceed permitted levels; and eleven had no VOC limits on any unit within the facility. Of the eleven facilities with no VOC limits, six emit VOCs at major source levels. Actual annual emissions for these six sources ranged from 107 to 1,848 tons per year.

Kentucky

This project reviewed sixty-four of the 482 Title V sources in Kentucky. While Kentucky's Title V permits are clear and straightforward, three main impediments led to incomplete data collection for the state. First, a significant number of permits were not available electronically, and many of those available were in draft or proposed form. Second, Kentucky had few restrictions on CO and NO_x emissions. Very few facilities had limits for these compounds, even when they had significant actual emissions. Finally, some emissions limits were in concentration units, but data in the permit were insufficient to convert the concentrations into actual tons allowed. In addition, several of the top emitters were natural gas transmission stations for which Kentucky issued generic permits. This permit contained equations and worksheets that facilities could use to plug in their own operation levels to determine specific emission levels. In addition, this permit contained general guidelines on operational procedures to control emissions. Since specific operational rates for different facilities were not provided, an emission level for these facilities could not be calculated.

The sixty-four facilities reviewed included:

- 11 electric power generating facilities
- 10 primary metal manufacturing facilities
- 5 chemical manufacturing facilities

- 5 food and kindred product facilities
- 4 educational institutions
- 4 printing and publishing facilities
- 4 rubber and plastic facilities
- 4 stone, clay, & glass manufacturing facilities
- 3 coal mining facilities
- 2 sand mining facilities
- 1 apparel manufacturing facility
- 1 auto service and repair facility
- 1 correctional institution
- 1 electronics manufacturing facility
- 1 furniture manufacturing facility
- 1 miscellaneous manufacturing facility
- 1 paper manufacturing facility
- 1 petroleum bulk station
- 1 petroleum & coal processing facility
- 1 textile manufacturing facility
- 1 transportation facility
- 1 water transport facility

The following three graphs provide an overview of the findings for actual versus allowable emissions. In summary, the analysis found that changes to the RMRR exemption had the potential to:

- increase CO emissions by 242% (1,465 tpy average increase per facility);
- increase NO_x emissions by 44% (2,653 tpy average increase per facility);
- increase PM10 emissions by 891% (1,463 tpy average increase per facility);
- increase SO_2 emissions by 300% (13,381 tpy average increase per facility); and
- increase VOC emissions by 168% (44 tpy average increase per facility).

Figure D-1. Actual Emissions vs. Allowable Emissions for 64 Title V Facilities in Kentucky

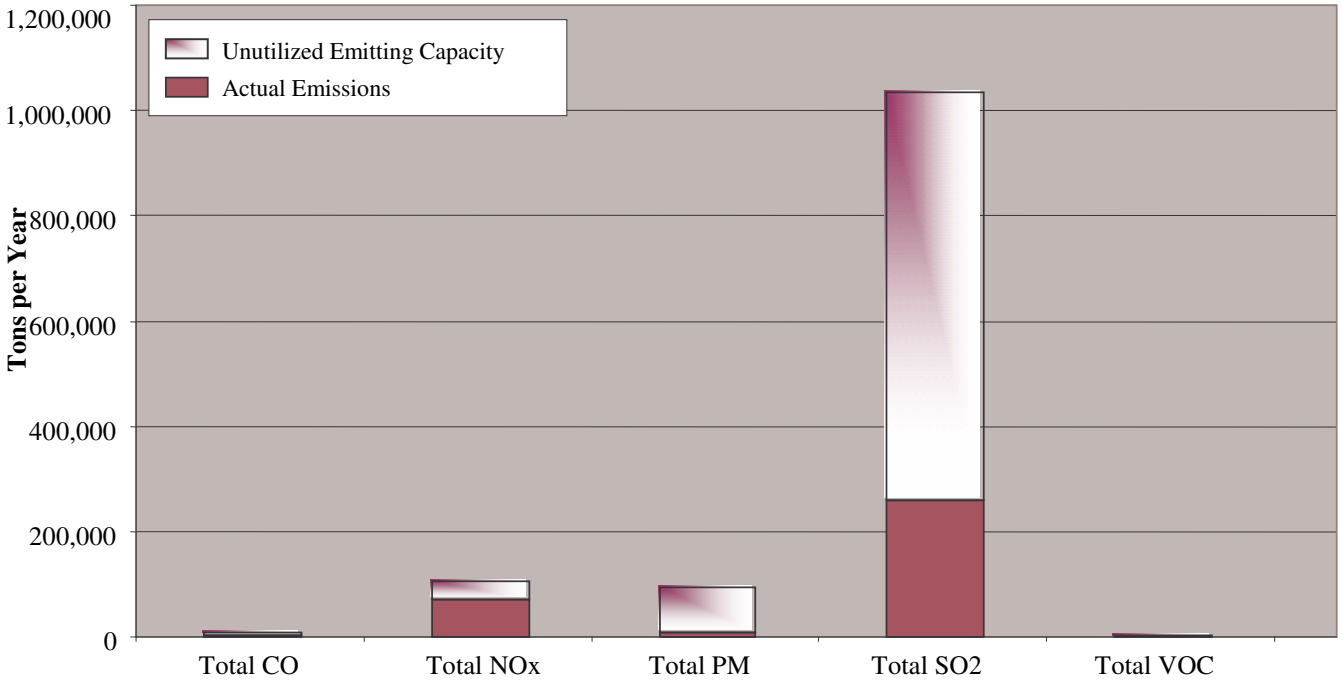


Figure D-2. Actual Emissions vs. Allowable Emissions for EGU Facilities in Kentucky

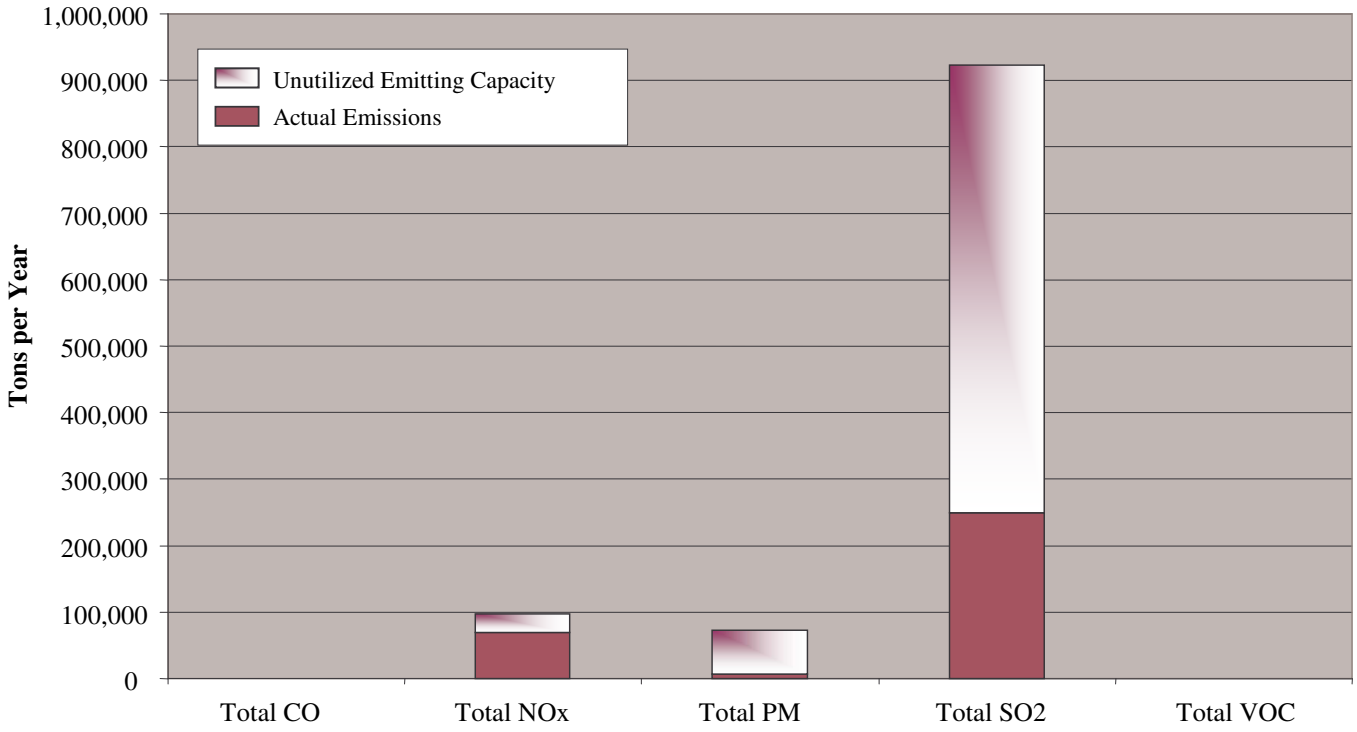
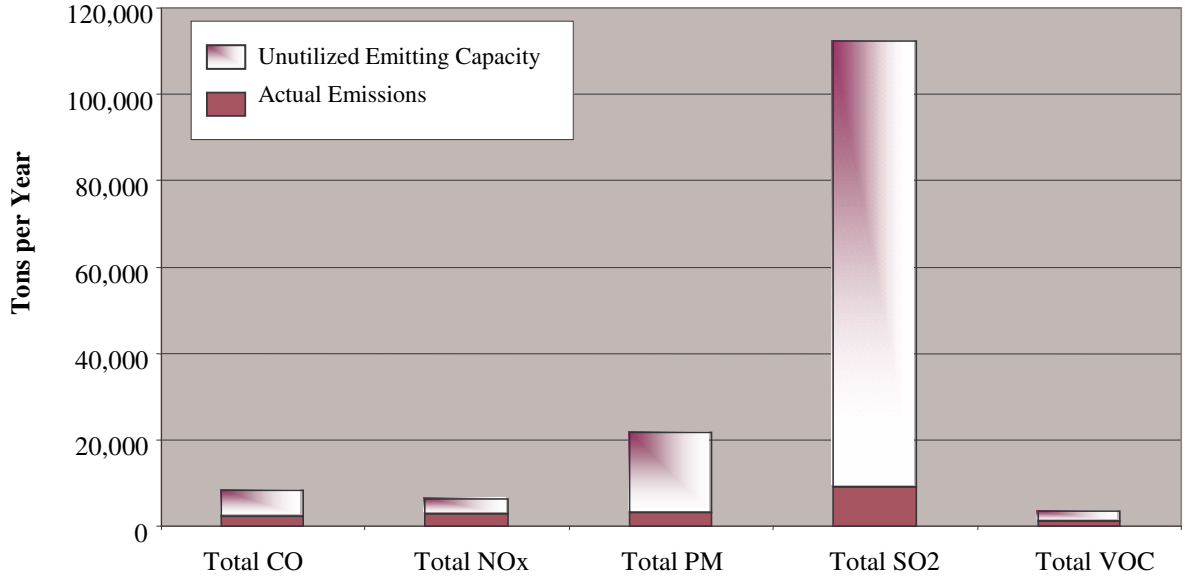


Figure D-3. Actual Emissions vs. Allowable Emissions for Non-EGU Facilities in Kentucky



Carbon Monoxide

Of the sixty-four facilities examined in Kentucky, only five had a limit for carbon monoxide emissions even though the total CO emissions from these facilities were 41,068 tons per year. The median actual emissions for carbon monoxide were 132 tpy and the average actual emissions were 1,369 tpy. Of the fifty-nine facilities without CO emission limit, twelve had actual emissions over major source threshold of 250 tons per year. The largest single emitter on the list had actual emissions of 26,128 tons per year of CO and had no emission limit for this pollutant on any unit.

NO_x

The median actual NO_x emissions were 581 tpy, the average was 5,186 tpy, and the total actual annual emissions were 155,572 tpy. Of all facilities analyzed, only twelve had NO_x emission limits on most units. Four facilities had emission limits on some units such that actual emissions far exceed permitted levels. Forty-eight facilities had no NO_x limits on any unit within the facility. Of the forty-eight facilities with no NO_x limits, nine were emitting at major source levels. Actual annual emissions for these nine sources ranged from 1,117 to 20,711 tons per year.

Particulate Matter

The median actual emissions were 99 tpy of PM, the average actual emissions were 292 tpy and the total actual emissions from all facilities were 8,751 tpy. Of the sixty-four facilities examined only two had no permit limit for PM. The remaining sixty-two facilities had PM emission limits for most units.

Sulfur Dioxide

The median actual emissions were 91,677 tpy of SO_2, the average actual emissions were 12,663 tpy and the total actual emissions from all facilities were 379,886 tpy. Of the sixty-four facilities examined, 44 had SO_2 emission limits for most units. Six facilities had no emission limits for SO_2, three had emission limits on a limited number of units, and eleven had no reported SO_2 emissions.

Volatile Organic Compounds

The median actual emissions for VOCS were 96 tpy, the average actual emissions were 426 tpy and the total actual emissions from all facilities were 12,772 tpy. Of the sixty-four facilities examined, only 17 had VOC emission limits for most units. Eight facilities had emission limits on some units such that the actual emissions were greater than the permitted emission levels, and 39 facilities had no emission limits on any units for VOCs. Of those 39 facilities, eight had actual emissions greater than major source thresholds with annual actual emissions ranging from 613 tpy to 1,890 tpy.

Michigan

This project reviewed permits for forty-two of the 1,119 Title V sources in Michigan. The main difficulty in calculating allowable emission levels for Michigan facilities stemmed from a lack of data regarding boiler capacity or air-flow data. In many cases, the Acid Rain permits contained data to calculate NO_x limits. However, it was often difficult to map the emission units described in the Acid Rain permit to those detailed in the Title V permit due to the use of different naming conventions. The forty-two facilities reviewed included:

- 12 electric power generating facilities
- 9 transportation equipment manufacturing facilities
- 4 primary metal manufacturing facilities
- 4 paper manufacturing facility
- 3 stone, clay, & glass manufacturing facilities
- 2 metal mining facilities
- 2 petroleum and coal product facilities
- 1 lumber and wood product facility
- 1 fabricated metal manufacturing facility
- 1 chemical manufacturing facility
- 1 educational institution
- 1 trucking and warehousing facility
- 1 packaging facility

The following three graphs provide an overview of the findings for actual emissions versus allowable emissions. In summary, the analysis found that changes to the RMRR exemption had the potential to:

- increase CO emissions by 242% (1,465 tpy average increase per facility);
- increase NO_x emissions by 44% (2,653 tpy average increase per facility);
- increase PM10 emissions by 891% (1,463 tpy average increase per facility);
- increase SO_2 emissions by 300% (13,381 tpy average increase per facility); and
- increase VOC emissions by 168% (44 tpy average increase per facility).

Figure D-4. Actual Emissions vs. Allowable Emissions for 42 Title V Facilities in Michigan

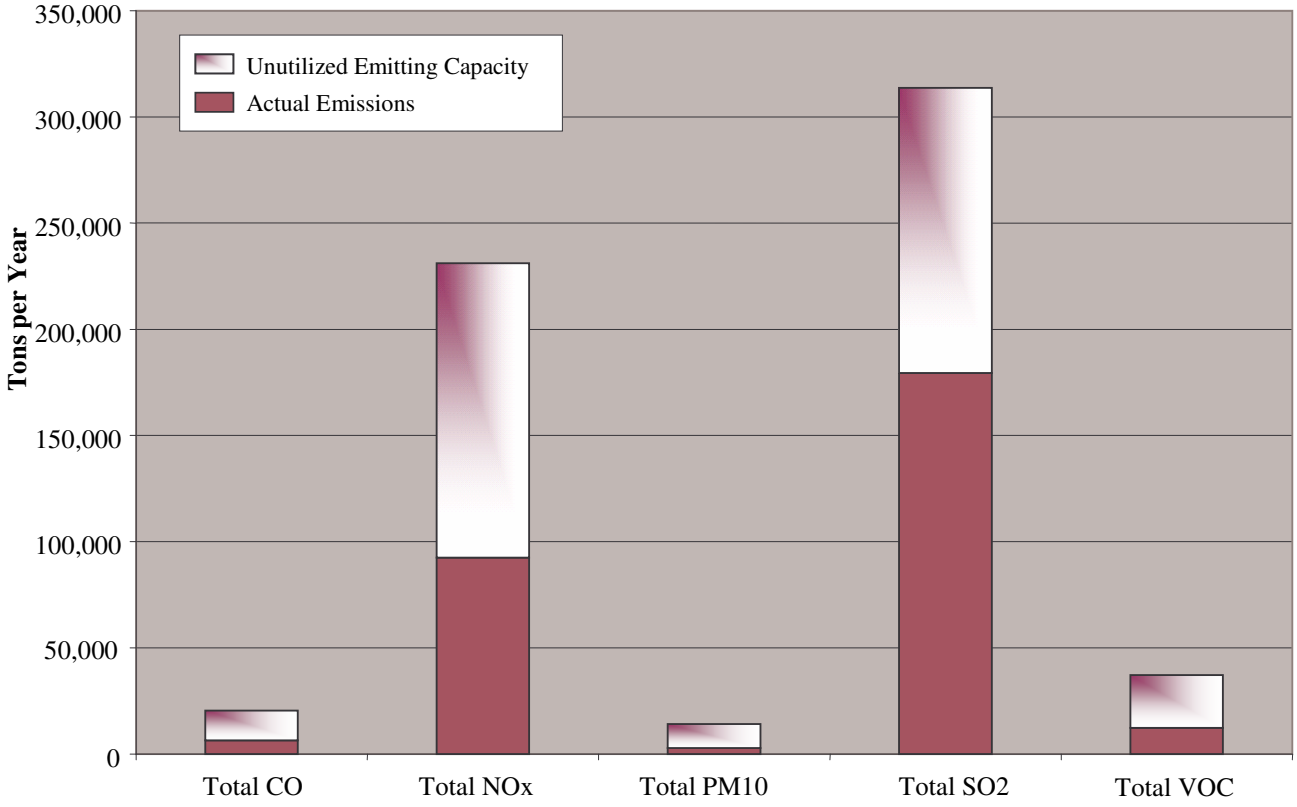


Figure D-5. Actual Emissions vs. Allowable Emissions for EGU Facilities in Michigan

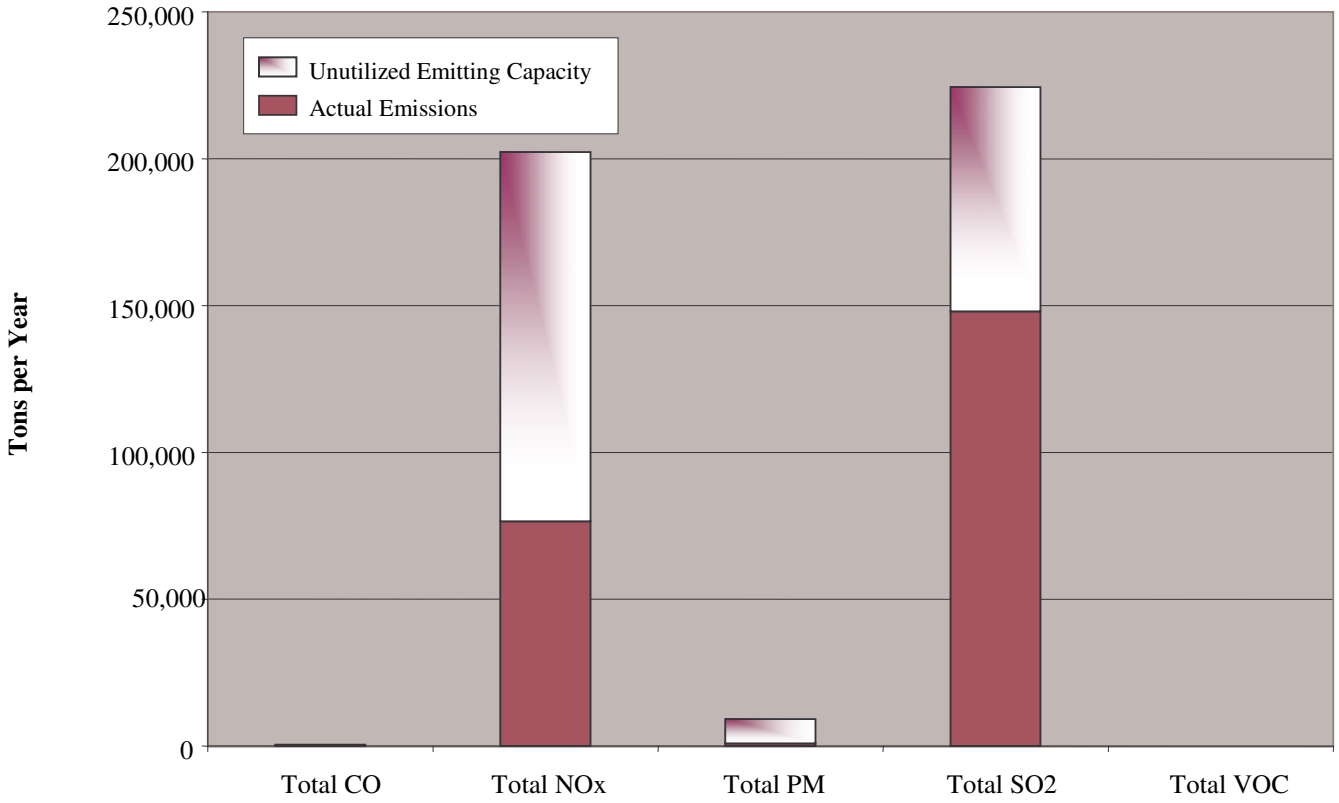
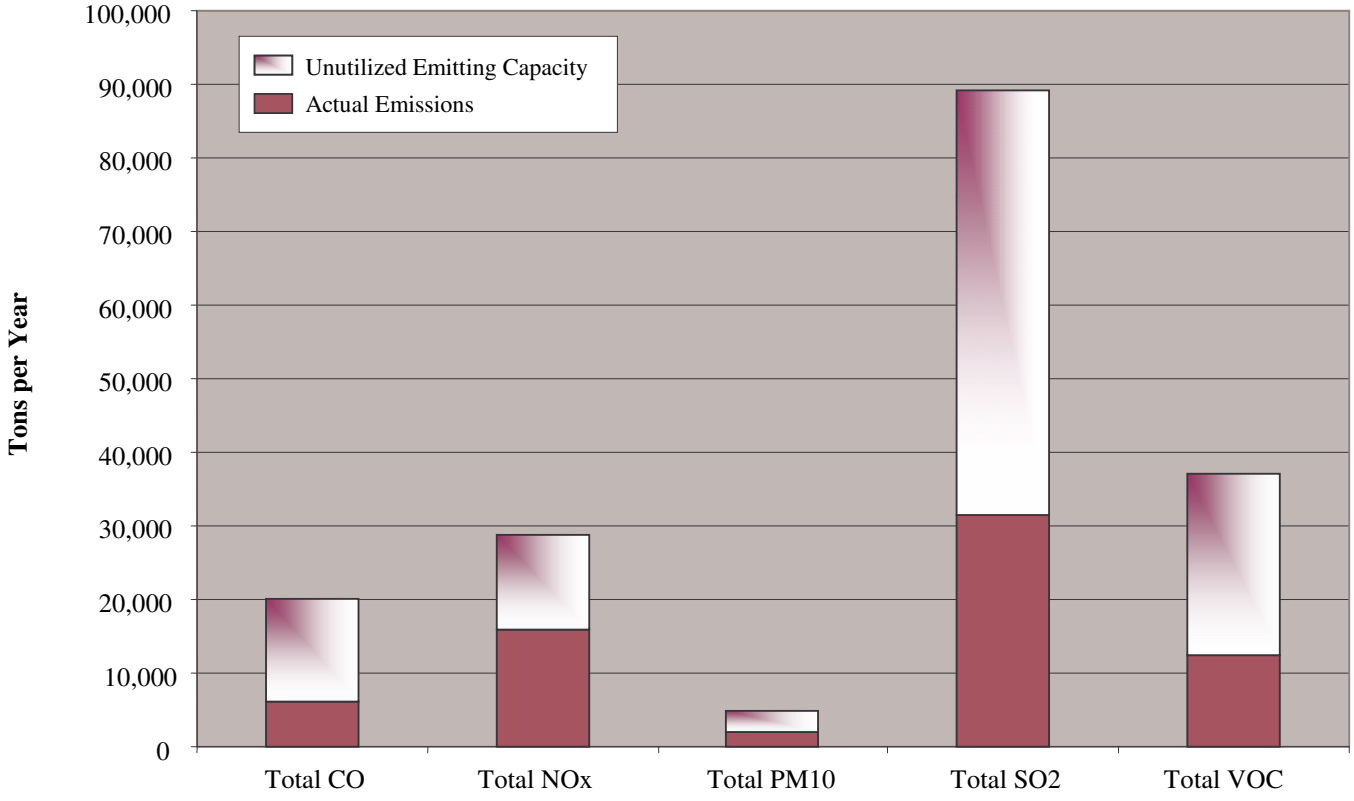


Figure D-6. Actual Emissions vs. Allowable Emissions for Non-EGU Facilities in Michigan



Carbon Monoxide

The median actual CO emissions from the forty-two facilities examined were 486 tpy and average emissions were 1,088 tpy. The total actual annual emissions from these facilities were 45,710 tpy. Of the forty-one facilities analyzed, eleven had CO emission limits on most units; eleven had emission limits on some units; and twenty had no CO limits on any unit. Eleven of the facilities with no limits emit CO at major source levels.

NO_X

The median actual NO_x emissions from the forty-two facilities examined were 1,978 tpy and average emissions were 5,402 tpy. Total actual annual emissions from these facilities were 226,875 tpy. Of the facilities analyzed: fifteen had NO_x emission limits on most units; sixteen had emission limits on some units; and eleven had no NO_x limits on any unit within the facility. Of the eleven facilities with no NO_x limits, seven emit NO_x at major source levels.

Particulate Matter

The median actual PM10 emissions from the forty-two facilities examined were 127 tpy and average emissions were 295 tpy. Total actual annual emissions from these facilities were 12,370 tpy. Of the forty-one facilities analyzed, nineteen had PM10 emission limits on most units and twenty had emission limits on some units. Of the three facilities with no PM limits, one emits PM10 at major source levels.

Sulfur Dioxide

The median actual SO_2 emissions from the forty-two facilities examined was 790 tpy and average emissions were 9,597 tpy. Total actual annual emissions from these facilities were 403,087 tpy. Of the facilities analyzed, nineteen had SO_2 emission limits on most units and thirteen had emission limits on some units. Of the ten facilities with no SO_2 limits, three emit SO_2 at major source levels.

VOC

The median actual VOC emissions from the facilities examined was 107 tpy and average emissions were 691 tpy. Total actual annual emissions from the forty-two facilities were 29,014 tpy. Of the facilities analyzed, eleven had VOC limits on most units; fourteen facilities had emission limits on some units; and seventeen had no VOC limits on any units within the facility. Of the seventeen facilities with no VOC limits, one emits VOCs at major source levels.

New Jersey

This project reviewed permits from twenty of the 923 Title V sources in New Jersey. The facilities included:

- 9 electric power generating facilities
- 3 primary metal manufacturing facilities
- 2 petroleum bulk station
- 1 food & kindred manufacturing facility

- 1 military installation
- 1 petroleum & coal products facility
- 1 pipeline
- 1 stone, clay, & glass manufacturing facility
- 1 trucking and warehouse facility

The following three graphs provide an overview of the findings for actual emissions versus allowable emissions. In summary, the analysis found that changes to the RMRR exemption had the potential to:

- increase CO emissions by 4,142% (6,531 tpy average increase per facility);
- increase NOx emissions by 1,820% (8,738 tpy average increase per facility);
- increase PM10 emissions by 1,401 % (795 tpy average increase per facility);
- increase SO_2 emissions by 555% (2,253 tpy average increase per facility); and
- increase in VOC emissions by 967% (3,305 tpy average increase per facility).

The extremely high percentages for potential increases in New Jersey are not surprising given the stringency of its permitting programs and its lower thresholds for triggering NSR. These figures likely represent New Jersey's use of the permitting program to reduce actual emissions.

Figure D-7. Actual Emissions vs. Allowable Emissions for 20 Facilities in New Jersey

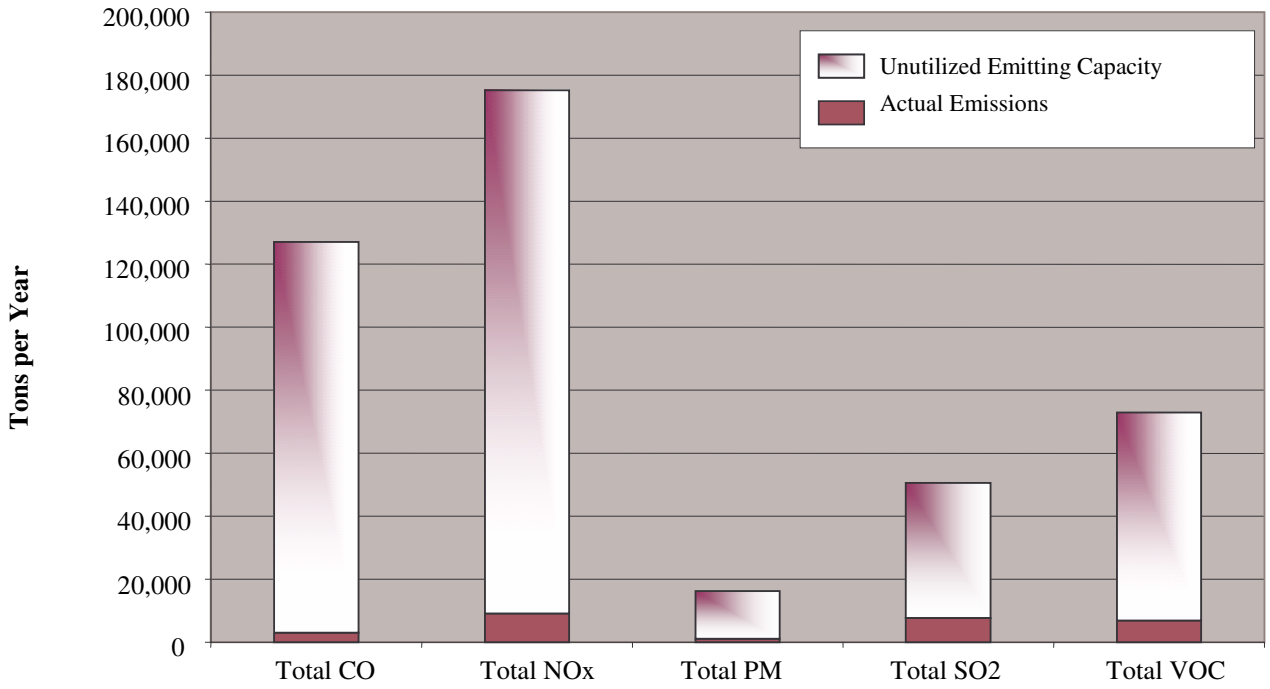


Figure D-8. Actual Emissions vs. Allowable Emissions for EGU Facilities New Jersey

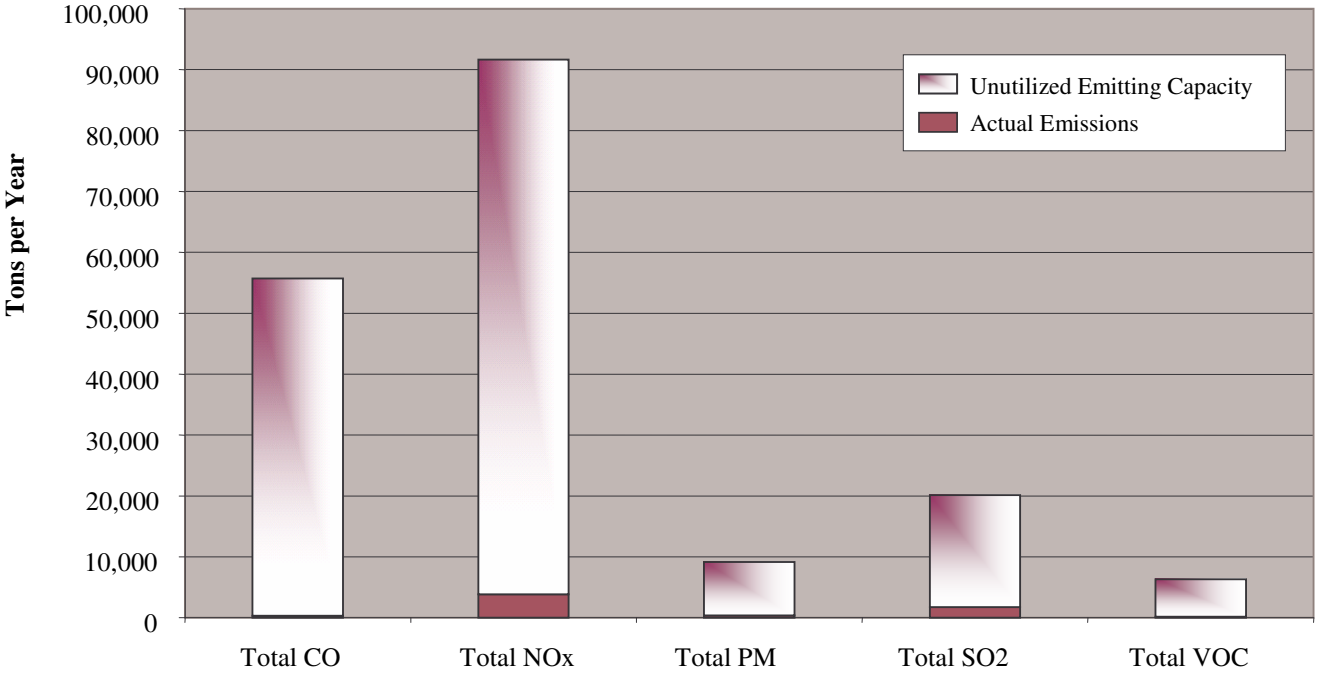
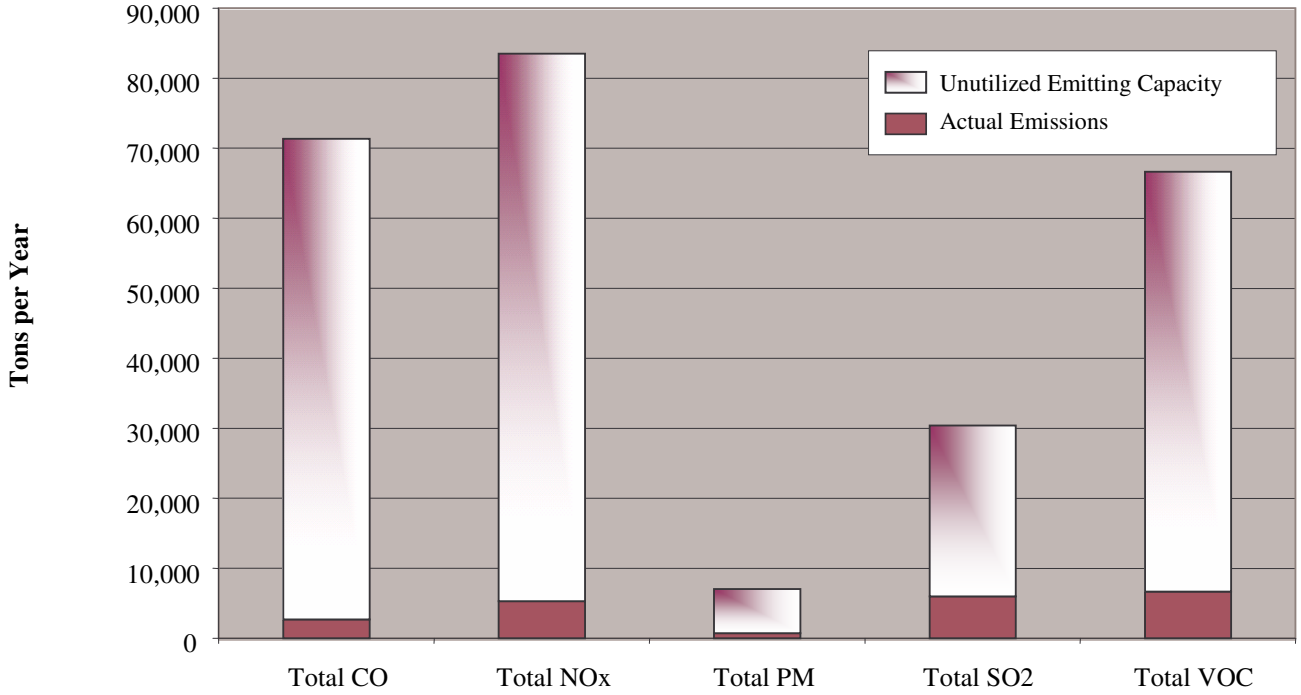


Figure D-9. Actual Emissions vs. Allowable Emissions for Non-EGU Facilities New Jersey



Carbon Monoxide

The median actual CO emissions from the twenty facilities examined were 39 tpy and average emissions were 158 tpy. Total actual annual emissions from these facilities were 2,996 tpy.

NO_X

The median actual NO_x emissions from the twenty facilities examined were 207 tpy and average emissions were 480 tpy. Total actual annual emissions from these facilities were 9,122 tpy.

Particulate Matter

The median actual PM10 emissions from the twenty facilities examined were 38 tpy and average emissions were 57 tpy. Total actual annual emissions from these facilities were 1,078 tpy.

Sulfur Dioxide

The median actual SO_2 emissions from the twenty facilities examined was 9 tpy and average emissions were 406 tpy. Total actual annual emissions from these facilities were 7,718 tpy.

VOC

The median actual VOC emissions from the twenty facilities examined was 37 tpy and average emissions were 342 tpy. Total actual annual emissions from these facilities were 6,832 tpy.

Ohio

This project reviewed permits for forty of the 1,218 Title V sources in Ohio. Some problems were encountered when calculating allowable emissions for some of the Ohio facilities because the data included in the permit did not provide enough information to calculate the tons of annual allowable emissions. For instance, there were several cases where emission limitations were given in "grains/dry standard cubic foot" for particulate matter, and "lb/gallon" for VOCs, without any usage information. There was also one case where the emission limit for an electric generator was given in "lb/MMBTU," but the capacity was not specified. The forty facilities included:

- 12 electric power generating facilities
- 8 primary metal manufacturing facilities
- 5 transportation facilities
- 4 chemical manufacturing facilities
- 3 stone, clay, and glass manufacturing facilities
- 2 rubber and plastic facilities
- 1 coal mining facility

- 1 food & kindred manufacturing facility
- 1 paper manufacturing facility
- 1 petroleum bulk station
- 1 petroleum & coal products facility
- 1 textile manufacturing facility

The following three graphs depict the findings for actual emissions versus allowable emissions. In summary, the analysis found that changes to the RMRR exemption had the potential to:

- increase CO emissions by 117% (1,551 tpy average increase per facility);
- increase NO_x emissions by 92% (184 tpy average increase per facility);
- increase PM10 emissions by 502% (2,308 tpy average increase per facility);
- increase SO_2 emissions by 257% (220,864 tpy average increase per facility); and
- increase in VOC emissions by 63% (248 tpy average increase per facility).

Figure D-10. Actual Emissions vs. Allowable Emissions for 40 Facilities in Ohio

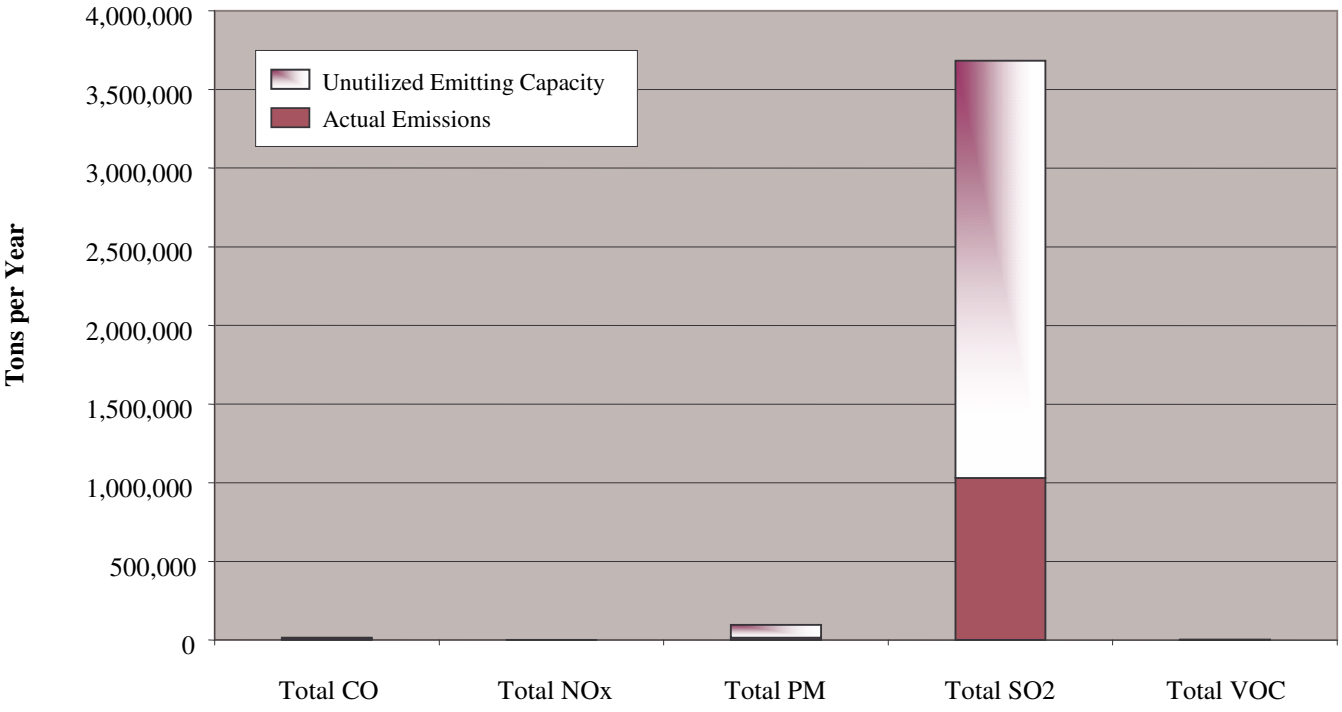


Figure D-11. Actual Emissions vs. Allowable Emissions for EGU Facilities in Ohio

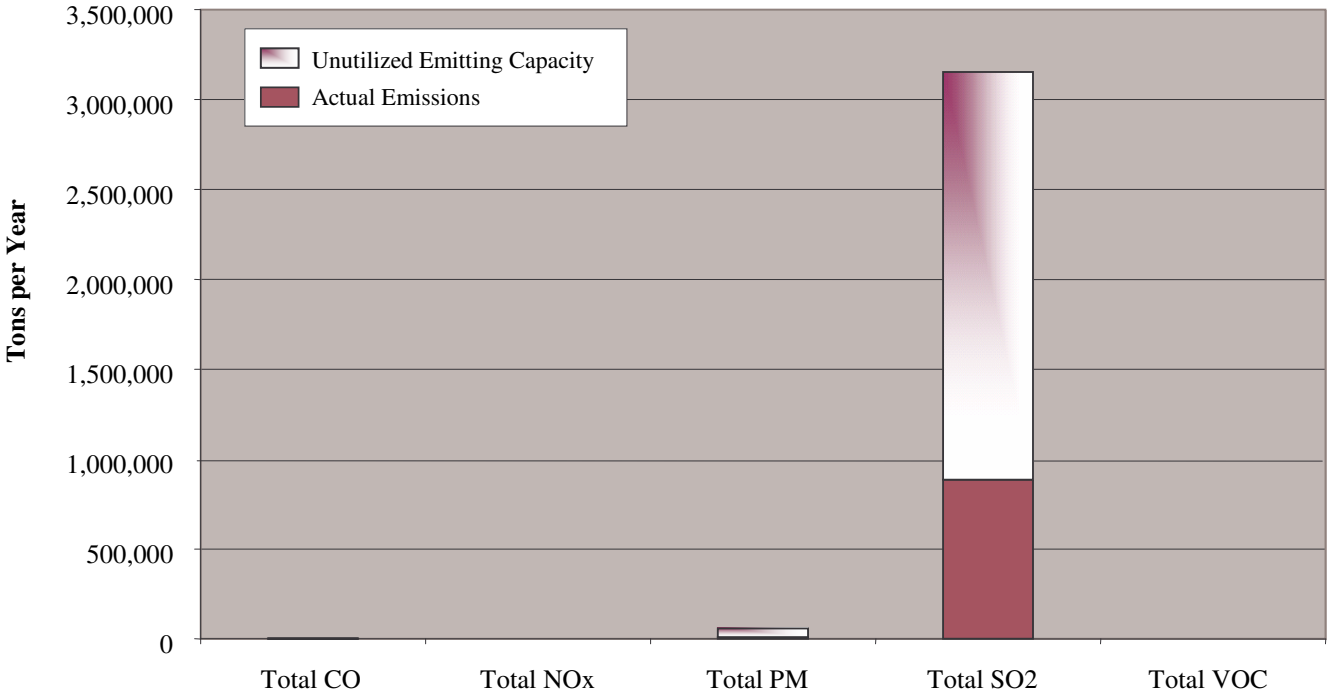
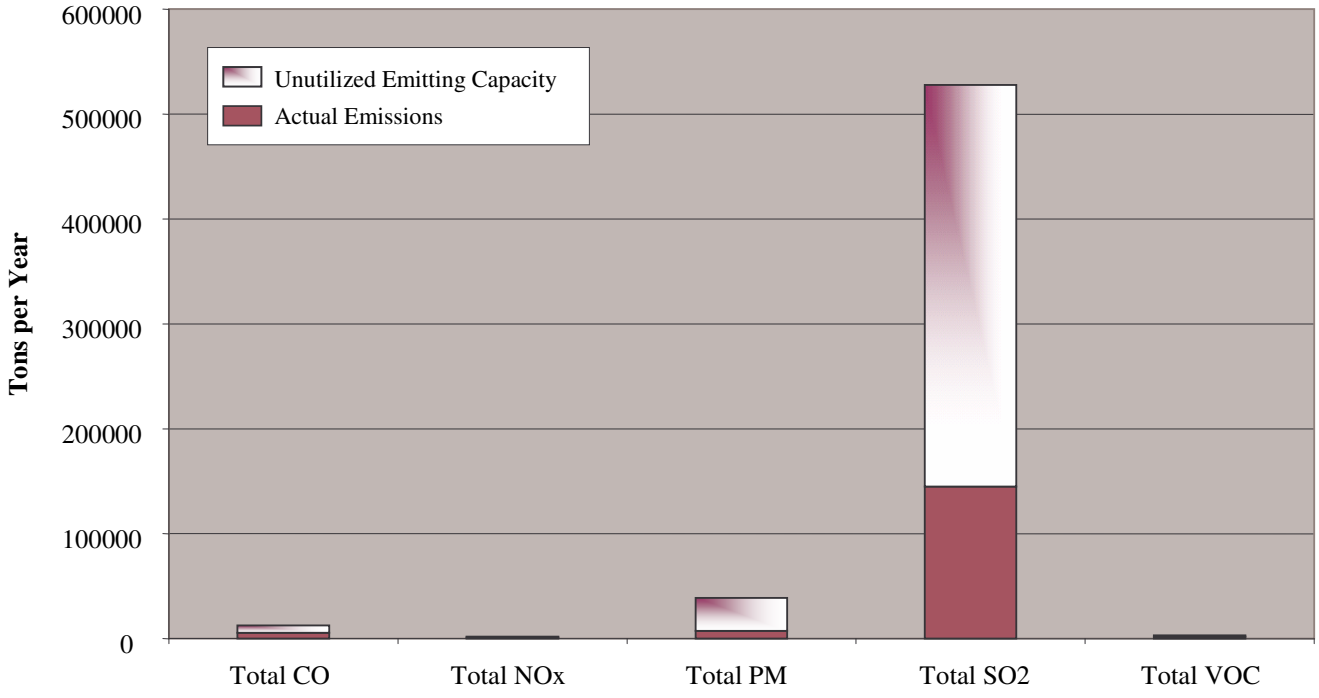


Figure D-12. Actual Emissions vs. Allowable Emissions for Non-EGU Facilities in Ohio



Carbon Monoxide

The median actual CO emissions from the forty facilities examined were 804 tpy, and average emissions were 5,240 tpy. Total annual actual emissions from these facilities were 178,144 tpy. Of the forty facilities examined in Ohio, seven had CO emission limits on most units. Thirteen facilities had CO emission limits on some units and fourteen facilities with significant CO emissions had no emission limits on any units. The largest single emitter on the list had actual CO emissions of 54,305 tons per year and had emission limits on seven emission units permitted at 39 tpy.

NO_x

Median actual NO_x emissions from all forty facilities were 621 tpy, the average was 9,523 tpy, and total actual emissions were 380,900 tpy. Of the forty facilities examined, six had emission limits on a majority of emission units; twenty had emission limits on a limited number of units; and fourteen had no emission limits on any unit. Of the fourteen facilities with no NO_x limits, eight had actual emissions greater than major source thresholds.

Particulate Matter

The median actual PM10 emissions for the forty facilities were 210 tpy, the average actual emissions were 441, and total actual emissions from all facilities were 17,813 tpy. Of the forty facilities examined only one had no permit limit for PM10, four had limits on a minority of units, and 35 facilities had limits on a majority of units.

Sulfur Dioxide

The median actual emissions from the forty facilities examined were 80,296 tpy of SO_2, the average actual emissions was 75,486 tpy, and total actual emissions from all facilities were 1,132,292 tpy. Of the forty facilities examined, one had emission limits on only a minority of emitting units, and thirty-nine facilities had SO_2 emission limits on a majority of emitting units.

Volatile Organic Compounds

The median actual emissions were 115 tpy of VOC, the average actual emissions was 365 tpy, and total actual emissions from all facilities were 12,790 tpy. Of the forty facilities examined, only six had VOC emission limits for most units; eleven had emission limits on some units such that the actual emissions were greater than the permitted emission levels; and eighteen had no VOC emission limits on any units. Of the eighteen facilities with no limits, nine had actual emissions greater than major source thresholds with annual actual emissions ranging from 100 tpy to 859 tpy. The remaining five facilities reported no VOC emissions.

West Virginia

This project reviewed permits for 155 Title V sources in West Virginia. These facilities included:

- 77 electric power generating facilities
- 12 coal mining facilities
- 11 fabricated metal products facilities

- 9 chemical manufacturing facilities
- 8 incinerators
- 7 lumber and wood product manufacturing facilities
- 5 stone, clay, & glass manufacturing facilities
- 4 primary metal manufacturing facilities
- 4 rubber and plastic facilities
- 3 paper manufacturing facilities
- 3 transportation facilities
- 2 hospitals
- 2 printing and publishing facilities
- 2 petroleum bulk station
- 2 petroleum & coal products facilities
- 1 misc. manufacturing facility
- 1 natural gas extraction facility
- 1 water transport facility
- 1 sand mining facilities

The following three graphs provide an overview of the findings for actual versus allowable emissions. In summary, the analysis found that changes to the RMRR exemption had the potential to:

- increase CO emissions by 125% (157 tpy average increase per facility);
- increase NO_x emissions by 177% (1,176 tpy average increase per facility);
- increase PM10 emissions by 5019% (1,745 tpy average increase per facility);
- increase SO_2 emissions by 175% (6,025 tpy average increase per facility); and
- increase VOC emissions by 181% (140 tpy average increase per facility).

Carbon Monoxide

The median actual CO emissions from the 155 facilities examined were 28 tpy and average emissions were 123 tpy. Total annual actual emissions from the 155 facilities were 17,058 tpy. The median allowable CO emissions from the 155 facilities were 74 tpy and average allowable emissions were 278 tpy. Total annual allowable emissions from the 155 facilities were 39,258 tpy. All of the facilities examined in West Virginia had CO emission limits on most units. Based upon these numbers, the median potential increase in emissions is 45 tpy (159% increase) and the average potential increase in emissions is 149 tpy (120%). The total potential increase in CO emissions from the 155 facilities is 21,835 tpy (125%).

Nitrogen Oxide

The median actual NO_x emissions from the 155 facilities examined was 98 tpy and average emissions were 1,517 tpy. Total annual actual NO_x emissions from the 155 facilities were 209,284 tpy. The median allowable CO emissions were 222 tpy and average allowable emissions were 2,644 tpy. Total annual allowable emissions from all facilities were 372,753 tpy. Of the 155 facilities examined in West Virginia, all had had NO_x emission limits on most units. Based upon these numbers, the median potential increase in emissions is 114 tpy (113% increase) and the average potential increase in emissions is 1,075 tpy (71%). The total potential increase in NO_x emissions from the 155 facilities is 162,272 tpy (177%).

Particulate Matter

The median actual PM10 emissions from the 155 facilities examined were 3 tpy and average emissions were 34 tpy. Total annual actual PM emissions from the 155 facilities were 5,093 tpy. The median allowable PM10 emissions from these facilities were 12 tpy and average allowable emissions were 1,757 tpy. Total annual allowable emissions from all facilities were 267,033 tpy. All facilities examined in West Virginia had PM10 emission limits on most units. Based upon these numbers, the median potential increase in PM10 emissions is 7 tpy (175% increase), and the average potential increase is 1,709 tpy (4,747%). The total potential increase in PM10 emissions from the 155 facilities is 261,816 tpy (5,019%).

Sulfur Dioxide

The median actual SO_2 emissions from the 155 facilities examined was 0.08 tpy and average emissions were 3,396 tpy. Total annual actual SO_2 emissions from the 155 facilities were 475,435 tpy. The median allowable emissions were 0.42 tpy and average allowable emissions were 9,397 tpy. Total annual allowable SO_2 emissions from the 155 facilities were 1,324,960 tpy. All facilities examined in West Virginia had SO_2 emission limits on most units. Based upon these numbers, the median potential increase in SO_2 emissions is 0.32 tpy (400% increase) and the average potential increase is 5,762 tpy (168%). The total potential increase in SO_2 emissions from the 156 facilities is 843,453 tpy (175%).

Volatile Organic Compounds

The median actual VOC emissions from the 155 facilities examined was 32 tpy and average emissions were 71 tpy. Total annual actual VOC emissions from the 155 facilities were 10,635 tpy. The median allowable VOC emissions from the 155 facilities were 76 tpy and average allowable emissions were 217 tpy. Total annual allowable emissions from the 155 facilities were 32,615 tpy. All facilities examined in West Virginia had VOC limits on most units. Based upon these numbers, the median potential increase in VOC emissions are 43 tpy (134% increase) and the average potential increase is 138 tpy (177%). The total potential increase in VOC emissions from the 156 facilities is 21,014 tpy (181%).

Figure D-13. Actual Emissions vs. Allowable Emissions for 75 EGU Facilities in West Virginia

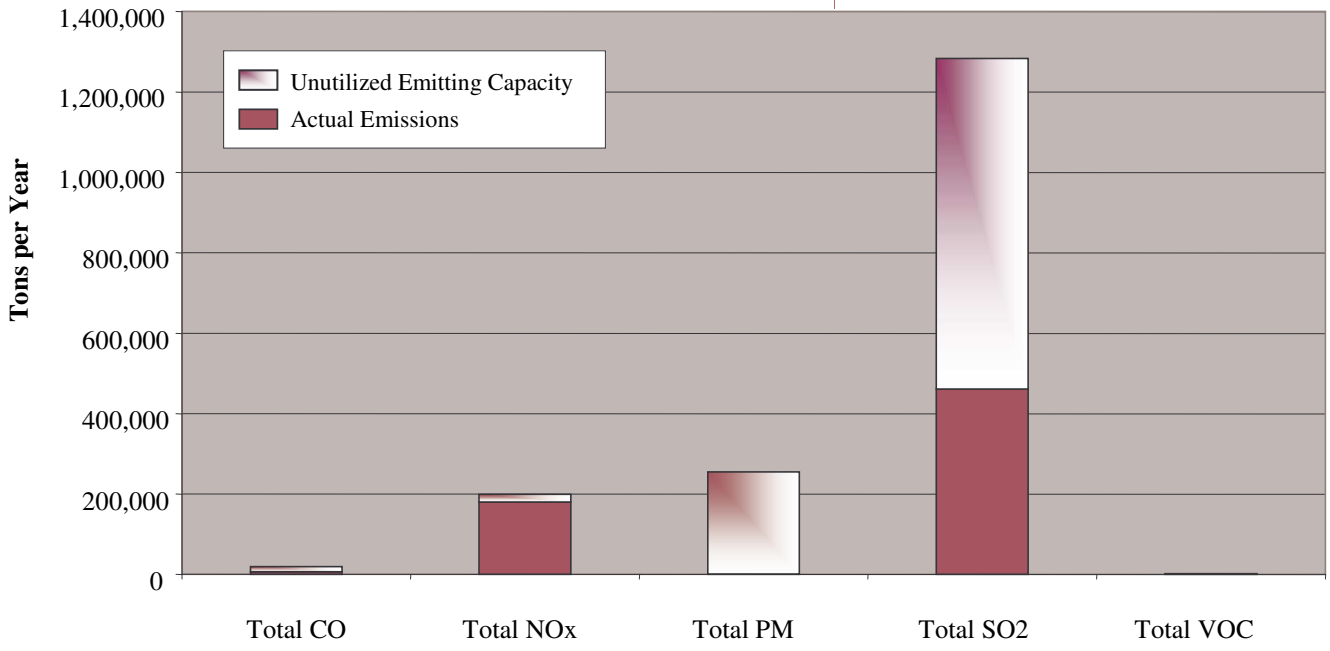


Figure D-14. Actual Emissions vs. Allowable Emissions for 80 Non-EGU Facilities in West Virginia