

**Regulatory Initiatives to Control NO<sub>x</sub>  
Emissions From Power Generation  
1990 to 2000 and Beyond**

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# REGULATORY INITIATIVES TO CONTROL NO<sub>x</sub> EMISSIONS FROM POWER GENERATION 1990 TO 2000 AND BEYOND

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## ABSTRACT

Since the passage of the Clean Air Act (CAA) Amendments of 1990, the reduction of nitrogen oxides (NO<sub>x</sub>) emissions from fossil fuel-fired power plants has been a special goal of the EPA. Manmade NO<sub>x</sub> emissions, and especially those from large stationary sources such as power plants, have been implicated as contributing to environmental ills ranging from acid precipitation to the formation of ground level ozone and smog. EPA's recent proposals to ratchet down power plant NO<sub>x</sub> emissions have come in the form of New Source Performance and National Ambient Air Quality Standards, mandates to states to revise their pollution control implementation plans, a regional market based and seasonal NO<sub>x</sub> emission cap-and-trade system, and enforcement actions against individual plant owners. Although each of these proposals had its own rationale and supposed statutory authority, the proposals were in many ways interrelated.

Each of EPA's recent NO<sub>x</sub> reduction proposals has been challenged in court and subjected to judicial review before it could take effect. Courts have upheld parts of EPA's NO<sub>x</sub> reduction efforts, but have rejected or modified others. Litigation over several elements continues. The treatment for EPA's proposed rules by the courts has caused considerable confusion and uncertainty for power plant owners. It has become difficult for plant owners to develop near-term and longer-term environmental compliance strategies because it is very hard to predict the timing and details of NO<sub>x</sub> emission limitations.

This paper will examine the background and driving factors for EPA's NO<sub>x</sub> reduction initiatives, provide an overview of recent regulatory and judicial developments, and discuss the substantive and procedural issues that remain to be addressed. Furthermore, it will summarize what actions the states are taking in response to these developments and explore the likely future implications for the power generation industry.

## INTRODUCTION

One of the Environmental Protection Agency's (EPA) stated implementation goals for the CAA Amendments of 1990 was to "Seek to eliminate the adversarial nature of the rulemaking and regulatory process."<sup>1</sup> The adversarial process has proved to be the rule rather than the exception for EPA's recent efforts to reduce NO<sub>x</sub> emissions from power generation facilities. During this period, there have been outstanding examples of cooperation and consensus building. The work of the Ozone Transport Assessment Group (OTAG) was especially noteworthy. However, litigation over actual regulations has been incessant and remarkable in the ways that it has aligned states with and against states, states with and against EPA, and industry with and against states and the EPA.

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<sup>1</sup> Environmental Protection Agency, Implementation Strategy for the Clean Air Act Amendments of 1990 - Update, 1993, Office of Air and Radiation, EPA 410-K-93-001, November, 1993, at 3.

As of September 2000, the end to some of the major legal battles appears to be in sight. Table 1 presents a summary of important dates and actions in EPA's major NO<sub>x</sub> emission control efforts affecting the power generation industry. As long as the March 3, 2000, court decision in *Michigan v. EPA* stands, NO<sub>x</sub> compliance requirements for power generators located in most of the eastern states will be written largely by the state pollution control agencies, subject to EPA review and approval. Power generators may welcome a period of certainty in their future NO<sub>x</sub> control requirements; nevertheless, the price of certainty will be high for many.

### **ENVIRONMENTAL SIGNIFICANCE OF NO<sub>x</sub> EMISSIONS**

Combustion of fossil fuels produces oxides of nitrogen, principally NO and NO<sub>2</sub>, which are collectively referred to as NO<sub>x</sub>. Depending on combustion conditions and the fuel used, some amount of NO<sub>x</sub> is present in the exhaust gas from any fossil fuel-fired power generating plant. The mass or the concentration of NO<sub>x</sub> emitted from a combustion source can be reduced by altering and controlling combustion conditions, by changing the fuel burned, or by the use of various processes that remove NO<sub>x</sub> from the exhaust gas.

Manmade NO<sub>x</sub> emissions have been found to cause or contribute to several adverse impacts on human health and the environment. NO<sub>x</sub> in the atmosphere can be transformed to acidic compounds such as nitric acid (HNO<sub>3</sub>), which, when washed out of the atmosphere, contributes to acidic precipitation. In turn, acidic precipitation can damage vegetation, soils, and water bodies, as well as manmade structures such as buildings, bridges, etc. NO<sub>x</sub> in the air can also be washed out as compounds that act as critical nutrients. Such washout of NO<sub>x</sub> derived nitrogen nutrients has been implicated as contributing to eutrophication of water bodies such as Chesapeake Bay.

In the presence of strong sunlight, NO<sub>x</sub> also reacts with Volatile Organic Compounds (VOCs) and oxygen (O<sub>2</sub>) to form ozone (O<sub>3</sub>). In the eastern states, the photochemical formation of ozone is most pronounced in the summer months. Ozone is a primary component of smog. Excessive ozone in the troposphere has several adverse impacts on human health. This includes causing or worsening asthma, bronchitis, chest pain, coughing, throat irritation, heart disease, and emphysema. Ozone can also damage crops and other plants and manmade materials such as rubber.

A source of NO<sub>x</sub> may cause or contribute to acid precipitation, eutrophication, or ground level ozone formation at locations very far downwind. The long range transport of NO<sub>x</sub> from upwind source areas to downwind impact areas has been a major contributing factor to the difficulty and controversy in developing and implementing regulatory control strategies.

### **NO<sub>x</sub> EMISSION LIMITS UNDER THE CAA TITLE IV ACID DEPOSITION CONTROL PROGRAM**

The first significant initiative to reduce NO<sub>x</sub> from existing power generating sources under the 1990 CAA Amendments was directed at reducing acid deposition experienced primarily in the eastern states. Congress had specifically found that "[C]ontrol measures to reduce [acidic compound] precursor emissions from steam-electric generating units should be initiated without delay."<sup>2</sup> EPA first promulgated regulations to reduce NO<sub>x</sub> emissions for the purpose of controlling acid precipitation in March 1994.<sup>3</sup> The regulations were immediately challenged and they were invalidated when the court found that EPA had exceeded its CAA statutory

<sup>2</sup> CAA § 401(a)(7), 42 U.S.C. § 7651(a)(7).

<sup>3</sup> 59 Fed. Reg. 13,538, March 24, 1994.

Table 1. Key Dates and Actions in NO<sub>x</sub> Control Initiatives

November 15, 1990 – President Bush signs the 1990 CAA Amendments into law.

March 24, 1994 – EPA publishes Final Rule limiting NO<sub>x</sub> emissions from certain coal-fired power plants under Phase I of the 1990 CAA Amendments' Title IV Acid Rain Program. 59 Fed. Reg. 13,538.

1994 – D.C. Circuit Court issues opinion in *Alabama Power Co. v. EPA* – 40 F.3d 450 (holding that EPA's Phase Title IV NO<sub>x</sub> emission limits are invalid because they exceed EPA's statutory authority).

November 14, 1994 – Deadline under CAA § 182(c)(2) for states with serious or worse nonattainment areas to submit SIP revisions demonstrating attainment of 1 hour ozone standard.

March 2, 1995 - EPA Assistant Administrator for Air and Radiation issues memorandum on Ozone Attainment Demonstrations.

March 1995 – Ozone Transport Assessment Group (OTAG) organized by the Environmental Council of States. It includes 37 eastern states and the District of Columbia.

April 13, 1995 – EPA publishes Final Rule setting CAA Title IV NO<sub>x</sub> emission limits for coal-fired power plants revised in accordance with the D.C. Circuit Court's opinion in *Alabama Power Co. v. EPA*. 60 Fed. Reg. 18,751.

1995 – EPA's Assistant Administrator for Air and Radiation launches Clean Air Power Initiative (CAPI).

January 1, 1996 – Revised compliance date for Group I Phase I coal-fired boilers under CAA Title IV Acid Rain Program.

October 1996 – EPA publishes CAPI Report.

December 19, 1996 – EPA publishes Final Rule setting revised emission limitations for Group I Phase I and Phase II coal-fired boilers under CAA Title IV Acid Rain Program. 61 Fed. Reg. 67,112.

1997 - D.C. Circuit Court issues opinion in *Virginia v. EPA* – 108 F.3d 1397 (holding that EPA may not use the SIP Call process in a manner that gives states no choice but to adopt the California low emission vehicle (LEV) program).

July 8, 1997 – EPA receives final recommendations from OTAG.

July 1997 – EPA publishes Final Rules setting new NAAQS for fine particulate matter and 8 hour ozone. 62 Fed. Reg. 38652, 62 Fed. Reg. 38856.

Table 1 (Continued). Key Dates and Actions in NO<sub>x</sub> Control Initiatives

July 16, 1997 – President Clinton issues Implementation Plan for Revised Air Quality Standards.

August 1997 – CAA § 126 Petitions filed by eight states: Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Pennsylvania, and Vermont.

October 1997 – OTAG final report, “OTAG Technical Supporting Document” published.

December 18, 1997 – EPA and eight states with CAA § 126 Petitions enter into Memorandum of Understanding (MOU).

February 13, 1998 – D.C. Circuit Court issues opinion in *Appalachian Power Co. v. EPA* – \_\_\_ F.3d \_\_\_ (upholding the bulk of EPA’s revised NO<sub>x</sub> emission limits for coal-fired power plants under CAA Title IV).

February 25, 1998 – EPA and eight states with CAA § 126 Petitions enter Consent Decree.

June 5, 1998 – EPA publishes Final Rule designating areas where the 1 hour ozone NAAQS no longer apply – 63 Fed. Reg. 31,014, supplemented with additional areas 63 Fed. Reg. 27,247, July 22, 1998. Generally, these are all areas that EPA had determined were in attainment with the 1 hour standard.

October 27, 1998 – EPA publishes SIP Call as Final Rule – 63 Fed. Reg. 57,356. This is proposed to also be the remedy for the eight states’ CAA § 126 Petitions.

Soon thereafter, 1998 – Eight states and several industry groups sue EPA to challenge the SIP Call. Cases later consolidated in *Michigan v. EPA*.

December 17, 1998 – EPA proposes to revoke the 1 hour ozone standard for Massachusetts, Maine, New Hampshire, and Rhode Island.

February 10, 1999 – *Michigan v. EPA* petitioners file motion to stay SIP Call.

April 1999 – CAA § 126 Petitions filed by New Jersey and Maryland.

May 14, 1999 – D.C. Circuit Court decision in *American Trucking Assn. v. EPA* renders 8 hour ozone and fine particulate NAAQS invalid.

May 25, 1999 – D.C. Circuit Court issues partial stay of SIP Call in *Michigan v. EPA*.

May 25, 1999 – EPA publishes Final Rule determining that portions of eight states’ CAA § 126 Petitions are approvable under the 1 hour or the 8 hour ozone NAAQS. Final Rule proposes cap-and-trade program as a remedy and includes a default remedy if the cap-and-trade program is not finalized. 64 Fed. Reg. 1999.

Table 1 (Continued). Key Dates and Actions in NO<sub>x</sub> Control Initiatives

- June 1999 – CAA § 126 Petitions filed by District of Columbia and Delaware.
- June 24, 1999 – EPA proposes stay on its 8 hour ozone standard technical determination and proposes to decouple the CAA § 126 Petition Remedy from the NO<sub>x</sub> SIP Call.
- September 19, 1999 - Original SIP Call due date for states to submit revised SIPs.
- October 25, 1999 – EPA published proposed rule to Rescind Findings that the 1 hour ozone standard no longer applies in certain areas – 64 Fed. Reg. 57424.
- October 29, 1999 – D.C. Circuit Court denies motion to stay CAA § 126 Petition Remedy.
- January 1, 2000 – Compliance date for NO<sub>x</sub> emission limits for Group 1 Phase II and Group 2 coal-fired boilers under CAA Title IV Acid Rain Program.
- January 18, 2000 – EPA publishes CAA § 126 Petition Remedy as Final Rule. 65 Fed. Reg. 2674.
- March 1, 2000 – EPA proposes to stay SIP Call only as it is related to the 8 hour ozone NAAQS.
- March 2, 2000 – EPA promulgates Final Rule, Technical Amendment revising NO<sub>x</sub> SIP Call state budgets.
- March 3, 2000 – D.C. Circuit Court, in *Michigan v. EPA*, upholds most of the SIP Call as it is related to the 1 hour ozone NAAQS.
- April 11, 2000 – EPA petitions D.C. Circuit Court to lift stay on SIP Call as related to the 1 hour ozone NAAQS.
- May 15, 2000 – Midwest Ozone Group (MOG) and WV Chamber of Commerce file citizens' suit against EPA demanding tougher CAA enforcement in six northeast states (CT, MA, ME, NH, NY, and RI).
- May 30, 2000 - MOG and EPA enter consent decree in citizens' suit.
- June 22, 2000 – D.C. Circuit Court issues order lifting SIP Call partial stay and setting giving affected 128 days to submit revised SIPs.
- August 30, 2000 – D.C. Circuit Court issues order requiring states to “fully comply” with the SIP Call by May 2004 rather than May 2003 as originally promulgated.
- October 30, 2000 – Revised SIPs due to EPA under order of D.C. Circuit Court.

Table 1 (Continued). Key Dates and Actions in NO<sub>x</sub> Control Initiatives

May 1, 2004 – States must “fully comply” with (Phase I) SIP Call mandated NO<sub>x</sub> emission reductions. Supplemental Compliance Pools available to 2006.

May 1, 2007 – States must “fully comply” with (Phase II) SIP Call mandated NO<sub>x</sub> emission reductions.

authority.<sup>4</sup> EPA promulgated revised regulations in April 1995.<sup>5</sup> The revised regulations were also challenged, but on the second time around, the court upheld the EPA in nearly all respects.<sup>6</sup>

The Title IV regulations look specifically to coal-fired boilers located in selected states as the sources for a two million pounds per year reduction in NO<sub>x</sub> emissions below 1980 emission levels. The regulations prescribe maximum annual average NO<sub>x</sub> emission rates that vary with the type of boiler construction. Group 1 Boilers include those that are either tangentially fired or dry bottom wall fired and that are also subject to Phase I controls on sulfur dioxide (SO<sub>2</sub>) emissions under Title IV.<sup>7</sup> As indicated in Table 2, Group 1 Boilers were required to comply with Phase I NO<sub>x</sub> emission limits by January 1996<sup>8</sup>, and with stricter Phase II NO<sub>x</sub> emission limits by January 2000.<sup>9</sup>

Table 2. NO<sub>x</sub> Emission Limitations for Coal-Fired Boilers Under the CAA Title IV Program

	Phase I (1/1/96)	Phase II (1/1/00)
Group 1	Tangentially Fired – 0.45 lb/MMBtu Dry Bottom Wall Fired – 0.50 lb/MMBtu	Tangentially Fired – 0.40 lb/MMBtu Dry Bottom Wall Fired – 0.46 lb/MMBtu
Group 2		Cyclone – 0.86 lb/MMBtu Wet Bottom – 0.84 lb/MMBtu Vertically Fired – 0.80 lb/MMBtu Cell Burner – 0.68 lb/MMBtu

Group 2 Boilers include cyclone boilers, wet bottomed boilers, vertically fired boilers, and cell burner boilers. Group 2 boilers were required to meet the emission limits in Table 2 by January 2000.<sup>10</sup> Although the Title IV NO<sub>x</sub> emission limits were more stringent than what the affected coal-fired sources had previously been required to meet, they were nowhere near as stringent as what EPA was preparing to propose under other CAA regulatory authorities.

## SUMMARY AND STATUS OF THE NO<sub>x</sub> STATE IMPLEMENTATION PLAN (SIP) CALL

In many ways, the NO<sub>x</sub> SIP Call has been a centerpiece in the EPA's efforts during the 1990s to force reductions in NO<sub>x</sub> emissions. The first part of the following discussion presents a brief

<sup>4</sup> *Alabama Power Co. v. EPA*, 40 F.3d 450 (D.C. Cir. 1994).

<sup>5</sup> 60 Fed. Reg. 18,751, April 13, 1995.

<sup>6</sup> *Appalachian Power Co. v. EPA*, xx F3d yy (D.C. Cir. 1997).

<sup>7</sup> Congress and EPA identified by name units at 107 coal-fired plants in 19 states that would be subject to Title IV Phase I SO<sub>2</sub> limitations. See CAA § 404, 42 U.S.C. 7651c, Table A, and 40 CFR § 73.10 Table 1.

<sup>8</sup> 40 CFR § 76.5.

<sup>9</sup> 40 CFR § 76.7.

<sup>10</sup> 40 CFR § 76.6.



summary of the authority and structure of EPA's NO<sub>x</sub> SIP Call.<sup>11</sup> The second section summarizes the status of the NO<sub>x</sub> SIP Call as of September 2000.

### **Principal Authorities**

Section 110(a)(2) of the CAA specifies requirements for SIPs. A basic requirement is that sources located in one state may not "contribute significantly" to difficulty that another state may experience attaining or maintaining compliance with National Ambient Air Quality Standards (NAAQS).<sup>12</sup> The EPA has specific authority to require that a state make revisions to its SIP whenever the administrator finds that the SIP is "substantially inadequate" either to mitigate interstate pollutant transport or to otherwise comply with any requirement of the CAA.<sup>13</sup> The basis of EPA's NO<sub>x</sub> SIP Call is that the designated SIPs are substantially inadequate in their compliance with the "good neighbor" requirement of CAA § 110(a)(2)(D)(i)(I).

The 1990 CAA Amendments established a classification system for areas not in attainment with the 1 hour ozone NAAQS.<sup>14</sup> In increasing order of severity, these classifications are marginal, moderate, serious, severe, and extreme. For all areas that were in classifications serious and above, the 1990 CAA Amendments required states to submit SIPs by November 14, 1994, that would demonstrate either attainment or an acceptable "rate of progress" towards attainment.<sup>15</sup>

This date passed and many states were not able to make the required demonstrations. The principal reason cited for this failure was that states contained "downwind" nonattainment areas that received ozone and ozone precursors transported from "upwind" and out of state sources. On March 2, 1995, EPA issued a memo titled "Ozone Attainment Demonstrations."<sup>16</sup> The memo indicated that EPA would roll back due dates for the SIP submittals as an administrative remedial matter.

The March 2, 1995 memo, following recommendations of the Environmental Council of the States, also called for the formation of a work group to assess the ozone transport phenomenon. The Ozone Transport Assessment Group (OTAG) was subsequently formed as a partnership

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<sup>11</sup> The rule is commonly referred to as the "NO<sub>x</sub> SIP Call." The rule's title as originally promulgated is "Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group for Purposes of Reducing Regional Transport of Ozone." 63 Fed. Reg. 57,356, Oct. 27, 1998.

<sup>12</sup> The following language has been referred to as the "good neighbor" provision of the CAA:

Each State Implementation Plan shall (D) contain adequate provisions – (i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emission activity within the state from emitting any air pollutant in amounts which will-

(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any such national primary or secondary ambient air quality standard[.]

CAA § 110(a)(2), 42 U.S.C. § 7410(a)(2).

<sup>13</sup> See CAA § 110(k)(5), 42 U.S.C. § 7410(k)(5).

<sup>14</sup> See CAA § 181, 42 U.S.C. § 7511.

<sup>15</sup> See CAA § 182, 42 U.S.C. § 7511a.

<sup>16</sup> Memorandum from Mary D. Nichols, Assistant Administrator for Air and Radiation, USEPA, March 2, 1995.

between EPA, the 37 easternmost states and the District of Columbia, as well as industrial representatives and environmental groups. OTAG's overall goal was stated as:

[To] identify and recommend a strategy to reduce transported ozone and its precursors, which in combination with other measures, will enable attainment and maintenance of the national ambient air quality standard in the OTAG region. A number of criteria will be used to select the strategy including, but not limited to, cost effectiveness, feasibility, and impact on ozone levels.<sup>17</sup>

From May 1995 to June 1997, OTAG developed models of ozone transport and recommendations for dealing with interstate transport phenomenon in the eastern states. EPA has stated that the OTAG work products were "the foundation" of the SIP Call as originally promulgated.<sup>18</sup>

The 1990 CAA Amendments also delineated a multi-state<sup>19</sup> ozone transport region (OTR) comprising the northeastern portion of the United States. An ozone transport commission (OTC) was formed and charged with: 1) assessing the degree of ozone and ozone precursor transport in the OTR; 2) assessing strategies to mitigate interstate transport of ozone and precursors; and 3) recommending to EPA measures to ensure that SIPs in the OTR states meet the requirements of CAA § 110(a)(2)(D).<sup>20</sup>

#### **Basic Structure and Content of the SIP Call**

Under the SIP Call, each affected state is assigned a NO<sub>x</sub> Emission Budget. The NO<sub>x</sub> Budget reflects the amount of NO<sub>x</sub> emissions that would remain after reductions have been made that are necessary to mitigate that state's "significant contribution" to downwind states' ozone NAAQS attainment problems. A complete discussion of the budgets would require delving deeply into EPA's models and its reasoning in defining "significant contribution." That analysis is beyond the scope of this presentation. However, the following<sup>21</sup> were specifically identified by EPA as elements in its significant contribution analysis:

- The overall nature of the ozone problem (i.e., "collective contribution").
- The extent to which downwind nonattainment problems are linked to upwind state's emissions, including the ambient impact of controls required under the CAA or otherwise implemented in the downwind areas.
- The ambient impact of the emissions from the upwind state's sources on the downwind nonattainment problems.
- The availability of highly cost effective control measures for upwind sources.

<sup>17</sup> Ozone Transport Assessment Group Policy Paper approved by the Policy Group on December 4, 1995.

<sup>18</sup> See, e.g., Final Rule Preamble, 63 Fed. Reg. 57,356, 57,362 (1998).

<sup>19</sup> The Ozone Transport Region includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia. CAA § 184, 42 U.S.C. § 7511(c).

<sup>20</sup> See CAA § 176A, 42 U.S.C. § 7506a.

<sup>21</sup> The factors are quoted directly from the Final Rule Preamble, 63 Fed. Reg. 57,356, 57,376 (1998).

EPA noted that the first three factors are related to air quality, while the fourth is related to cost.<sup>22</sup>

First, EPA projected a "2007 base year emissions inventory," which is the amount of NO<sub>x</sub> that sources in affected states would emit during the ozone season<sup>23</sup> in 2007. This would take into account existing sources, expected growth, and control measures otherwise required under the CAA.<sup>24</sup> EPA then projected the amount of 2007 ozone season NO<sub>x</sub> emissions that would occur if each affected state applied what EPA determined would be "highly cost effective control measures."<sup>25</sup> EPA referred to this as the "2007 controlled inventory."

Most of the NO<sub>x</sub> emission reductions projected between the 2007 base year inventories and the 2007 controlled inventories would come from controls on power generation sources.<sup>26</sup> EPA determined that "highly cost effective control measures" were available to reduce emissions from Electric Generating Units (EGUs) larger than 25 MWe, on average, to 0.15 lb NO<sub>x</sub> per million Btu of fuel input.<sup>27</sup> EPA did not envision that each source in this category could achieve this emission rate in a highly cost effective manner. Rather, the analysis and the final rule assume that the affected states choose to participate in a NO<sub>x</sub> emission cap-and-trade allowance system.<sup>28</sup>

It is important to note that the NO<sub>x</sub> SIP Call does not require that a state's revised SIP makes the source-specific reductions that EPA used to determine the state's budget. The rule simply requires that the SIP revision "Contains control measures adequate to prohibit emissions of NO<sub>x</sub> that would otherwise be projected to cause the jurisdiction's overall NO<sub>x</sub> emissions to be in excess of the budget for that jurisdiction[.]"<sup>29</sup>

All of the states' control measures must be "fully implemented" by May 1, 2004.<sup>30</sup> If a state elects to participate in EPA's or a comparable interstate NO<sub>x</sub> emission trading program, then this requirement "shall be deemed satisfied for the portion of the budget covered by the interstate trading program."<sup>31</sup>

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<sup>22</sup> *Id.*

<sup>23</sup> The ozone season is "the period of time beginning May 1 of a year and ending on September 30 of the same year, inclusive." See, e.g., *Id.* at 57,498.

<sup>24</sup> *Id.* at 57,405.

<sup>25</sup> *Id.*

<sup>26</sup> The state NO<sub>x</sub> budgets have been revised several times since their initial promulgation in October 1998. The last Technical Amendment was made March 2, 2000. See 65 Fed. Reg. 11222. However, even those budgets require tweaking to be consistent with the court's March 3, 2000 opinion in *Michigan v. EPA*.

<sup>27</sup> Final Rule Preamble, 63 Fed. Reg. 57,356, 57401-402 (1998).

<sup>28</sup> *Id.* Details of the model NO<sub>x</sub> Budget Trading Program are discussed at 57,456 et seq. The regulations are codified at 40 CFR Part 96.

<sup>29</sup> 40 CFR §51.121(b)(1).

<sup>30</sup> *Id.* An August 30, 2000 court order extended this date from the originally promulgated deadline of May 1, 2003. Note though that the budgets contain a limited number of compliance supplement allowances for the years 2003 to 2006. See, e.g., Final Rule Technical Amendment 65 Fed. Reg. at 11228, Table 8. There are significant restrictions on the use of allowances from the compliance supplement pool.

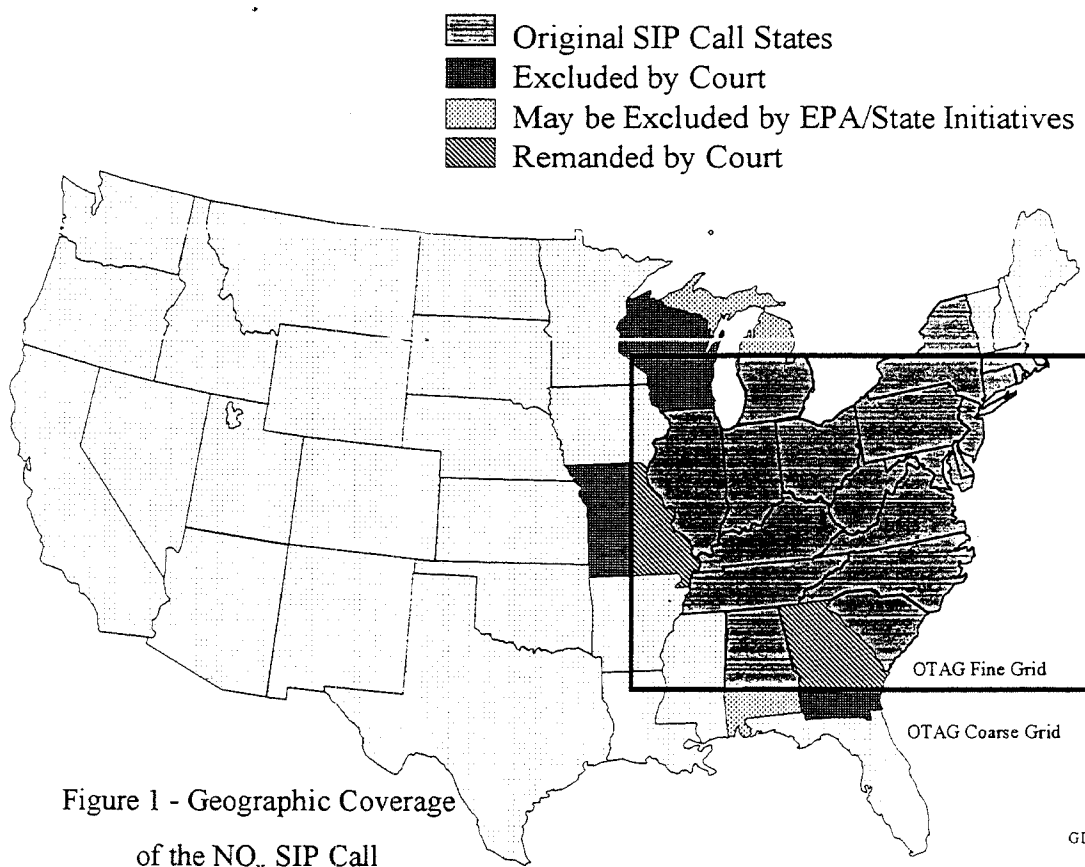
<sup>31</sup> 40 CFR § 51.121(b)(2).

## Affected States

When the NO<sub>x</sub> SIP Call was promulgated in 1998, the following were to submit revised plans:

Alabama, Connecticut, District of Columbia, Delaware, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, Wisconsin, and West Virginia.

Figure 1 is a map indicating the geographic coverage of the NO<sub>x</sub> SIP Call as originally promulgated. As discussed below, under the court's ruling in *Michigan v. EPA*, Georgia, Missouri, and Wisconsin are no longer part of the SIP Call, subject to future rulemaking by EPA. EPA has indicated in letters to governors of Alabama and Michigan that it intends to accept "partial budget" SIP revisions from those states as meeting the "Phase I" obligations of the SIP Call. The due date for all Phase I SIP revisions was October 30, 2000.



## Allocation of NO<sub>x</sub> Emission Allowances

In an effort to encourage affected states to develop an interstate market based trading program as their collective implementation plan remedies, EPA included recommendations for developing an allowance trading program in the original NO<sub>x</sub> SIP Call rulemaking. EPA also proposed a Federal Implementation Plan to serve as a model for other states to adopt, as well as a default remedy for those affected states that failed to obtain approval of their own proposed SIPs. Under

this program, each allowance would equal authorization to emit 1 ton of NO<sub>x</sub> during the ozone season in which the allowance is used. Owners and operators of affected units would have to install the requisite monitoring systems for tracking mass NO<sub>x</sub> emissions (emission rate, concentration, heat input and flow), the requirements of which would be set forth in a new Subpart H of the Acid Rain Program (40 CFR 75).

The primary challenge in developing a SIP based on a cap-and-trade system is determining how to equitably allocate the NO<sub>x</sub> allowances budgeted to each state. In recommending its model federal trading program, EPA proposed three different allowance allocation methodologies for allocating allowances to EGUs, based on: (1) the product of an emission rate in lbs/MMBtu and the MMBtus of energy utilized for all units in the program, (2) the product of an emission rate in lbs/kWh and the total kWh of electricity generated, or (3) solely on the electricity generated. Each method would use the average of the data for the two highest control periods for the years 1995, 1996, and 1997 to determine an EGU's initial allocation for the initial 2003 through 2005 control period.

To provide for new units that commence operation during or after the period on which general NO<sub>x</sub> allowance allocations are based, a "set-aside" account would be established. This account would consist of 5 percent of the state trading program budget in 2003, 2004, and 2005, as well as 2 percent of the trading program budget in subsequent years. This would allow for new units to request allowances on a first come, first serve basis, for up to five consecutive control periods. Allowances for new EGUs would be issued initially at a rate of 0.15 lb/mmBtu multiplied by the unit's maximum design heat input. After each control period, the unit would be subject to a reduced utilization calculation, wherein NO<sub>x</sub> allowances would be deducted based on the unit's actual utilization (allocation adjusted by actual heat input for the control period of the allocation).

A compliance supplement pool would also be established for each affected jurisdiction, to be distributed to sources as either an incentive for early reductions, or to provide relief to sources that demonstrate a need for a compliance extension. As originally promulgated, these supplemental pool allowances would only be available for use in 2003 or 2004 periods, and any allowances that are not distributed by a state prior to May 1, 2003 would be retired by EPA. It is not yet clear how the supplement pool will be affected by the court's August 30, 2000 order that extended the SIP Call compliance deadline from May 2003 to May 2004.

EPA proposes to include banking provisions wherein allowances may be held by affected sources for future use beginning in 2003. However, in order to limit the variability associated with banking and discourage "excessive" use of banked allowances, the EPA has proposed a flow control mechanism that would apply a discount rate on the use of banked allowances over a certain level. Any time the total number of banked allowances in the program exceeds 10 percent of the allowable NO<sub>x</sub> emission for all sources, a 2-for-1 discount ratio would be applied above a certain level.

Finally, EPA proposed allowing individual combustion sources located within the affected jurisdictions that vent to a stack, but that are not designated NO<sub>x</sub> budget units, the opportunity to voluntarily "opt-in" to the program and obtain allowances. This would create an opportunity for

nonaffected sources emitting significant amounts of NO<sub>x</sub> that are able to achieve cost effective reductions to opt-in to ultimately obtain excess allowances they can then sell on the market. The EPA reasons that by allowing these units to join the program and make incremental, lower cost reductions, additional allowances will be freed up for use by other NO<sub>x</sub> budget units, thereby further reducing the overall cost of compliance for the program.

### **CURRENT STATUS OF THE NO<sub>x</sub> SIP CALL**

On March 3, 2000, a three judge panel<sup>32</sup> of the District of Columbia Circuit Court of Appeals issued an opinion<sup>33</sup> upholding significant portions of the rule. The court had earlier issued an order that partially stayed the EPA from enforcing the requirements and deadlines in the rule as originally promulgated. Court orders dated June 22, 2000, and August 30, 2000, removed lingering uncertainty over compliance dates. EPA's motion that requested lifting of the partial stay is significant because it indicates how EPA intends to resolve matters that were remanded to it in the court's opinion. Figure 1 indicates the geographic coverage of the SIP Call as affected by the court's opinion and by EPA's actions.

### **Summary of Opinion in *Michigan v. EPA***

The court's opinion is written in four parts. Part I of the opinion rejects each of the following six arguments that challenged EPA's promulgation of the NO<sub>x</sub> SIP Call in a general way:

- That EPA could not make SIP Call without having first convened a transport commission.<sup>34</sup>
- That EPA failed to undertake a sufficiently specific determination of which upwind states contribute to ozone NAAQS nonattainment in the downwind northeastern states.<sup>35</sup>
- That EPA unlawfully overrode past precedent on what constitutes "significant contribution" of a source or sources of emissions to ozone nonattainment.<sup>36</sup>
- That EPA's consideration of costs for achieving reductions of NO<sub>x</sub> emissions violated the Clean Air Act (CAA).<sup>37</sup>
- That the SIP Call's scheme of "uniform" controls is arbitrary and capricious.<sup>38</sup>
- That CAA § 110(a)(2)(D)(i)(I) as construed by EPA violates the nondelegation doctrine.<sup>39</sup>

Part II of the opinion contains the following conclusions as to whether four individual states were properly included in the NO<sub>x</sub> SIP Call:

- The record that EPA prepared in the rulemaking process does not support including Wisconsin in the NO<sub>x</sub> SIP Call.<sup>40</sup>

<sup>32</sup> A subsequent motion for a rehearing by the D.C. Circuit en banc was denied.

<sup>33</sup> *State of Michigan v. EPA*, F.3d, D.C. Cir. March 3, 2000, Docket No. 98-1497, Slip Opinion.

<sup>34</sup> *Id.*, Slip Opinion at 5 to 7 of 37.

<sup>35</sup> *Id.* at 8 to 9 of 37.

<sup>36</sup> *Id.*, at 9 to 10 of 37.

<sup>37</sup> *Id.*, at 10 to 15 of 37.

<sup>38</sup> *Id.*, at 15 to 16 of 37.

<sup>39</sup> *Id.*, at 16 to 17 of 37.

<sup>40</sup> *Id.*, at 17 to 18 of 37.

- The record that EPA prepared in the rulemaking process does not support creating NO<sub>x</sub> budgets based on NO<sub>x</sub> emission sources located throughout Missouri and Georgia.<sup>41</sup>
- Including South Carolina in the NO<sub>x</sub> SIP Call was not arbitrary and capricious.<sup>42</sup>

Part III of the opinion makes the following two conclusions regarding challenges to the SIP Call based on principles of Federalism and the federal Regulatory Flexibility Act:

- The NO<sub>x</sub> SIP Call does not impermissibly intrude on statutory rights of states to fashion their SIPs.<sup>43</sup>
- The NO<sub>x</sub> SIP Call does not violate the Regulatory Flexibility Act.<sup>44</sup>

Part IV of the opinion covers the “Remaining Claims” of those who challenged the NO<sub>x</sub> SIP Call. In Part IV the court specifically does the following:

- Rejects a claim that EPA arbitrarily revised the definition of a “NO<sub>x</sub> budget unit.”<sup>45</sup>
- Rejects all but one claim brought by the Council of Industrial Boiler Owners (CIBO).<sup>46</sup> The court does agree that EPA failed to give adequate notice of a change in the definition of “electric generating unit.”<sup>47</sup>
- Agrees that EPA did not provide adequate notice of a change in the control level assumed for “large stationary internal combustion engines”<sup>48</sup>, but rejects a claim that EPA did not follow its own standards in defining such units.<sup>49</sup>
- Upholds EPA’s limitations on the use of early reduction credits.<sup>50</sup>
- Upholds EPA’s use of a 15 percent multiplier for calculating emissions from “low mass emission units.”<sup>51</sup>

#### **Implications of the *Michigan v. EPA* Opinion for Wisconsin, Georgia, and Missouri**

The opinion states that “EPA erroneously included Wisconsin in the SIP Call because EPA failed to explain how Wisconsin contributes to nonattainment in any other state.”<sup>52</sup> During oral argument, EPA admitted that, although it had demonstrated that sources in Wisconsin contribute to ozone over Lake Michigan, it had not made a similar demonstration that Wisconsin sources contribute to ozone in *other states*. For the time being, the opinion means that Wisconsin’s inclusion in the SIP Call is “set aside.”<sup>53</sup> There is nothing in the opinion that would preclude EPA from undertaking a separate rulemaking addressing control of NO<sub>x</sub> sources in Wisconsin provided that EPA could make a demonstration on the “significant contribution” issue.

<sup>41</sup> *Id.*, at 18 to 22 of 37.

<sup>42</sup> *Id.*, at 22 of 37.

<sup>43</sup> *Id.* at 23 to 26 of 37.

<sup>44</sup> *Id.* at 26 to 27 of 37.

<sup>45</sup> *Id.* at 27 to 28 of 37.

<sup>46</sup> *Id.*, at 28 to 30 of 37.

<sup>47</sup> *Id.*, at 30 to 31 of 37.

<sup>48</sup> *Id.*, at 31 to 32 of 37.

<sup>49</sup> *Id.* at 32 of 37.

<sup>50</sup> *Id.* at 33 to 34 of 37.

<sup>51</sup> *Id.*, at 34 of 37.

<sup>52</sup> *Id.* at 17 of 37.

<sup>53</sup> *Id.*, at 18 of 37.

The court also found that EPA's rulemaking record did not support the way that EPA included Missouri and Georgia in the SIP Call. The SIP Call's NO<sub>x</sub> budgets for these two states were determined like those for other states in that they included NO<sub>x</sub> sources located throughout the state. For each state, EPA first projected the amount of statewide NO<sub>x</sub> emissions that would occur in 2007 assuming normal growth and the presence of controls otherwise mandated by the CAA. EPA then projected statewide 2007 NO<sub>x</sub> emissions if "highly cost effective controls" were implemented. The NO<sub>x</sub> SIP Call sets a statewide NO<sub>x</sub> emission budget that is equal to the emissions that would occur if the highly cost effective controls were implemented.

The OTAG modeling that EPA relied on to support the SIP Call had split the states of Missouri and Georgia. Some parts of the states were included in the "fine grid" portion of the models, while other portions were included in the "coarse grid" portion. Generally, southern Georgia and western Missouri were in the coarse grid portion. OTAG had separately concluded that emissions from sources located in the coarse grid were not of special concern.

Although EPA relied on the OTAG models to support the SIP Call, it chose to include sources throughout Missouri and Georgia in the NO<sub>x</sub> emission budgets for those states. The court did not accept any of the EPA's proffered reasons for including sources throughout the two states. The court's opinion "vacates" the SIP Call with respect to Missouri and Georgia and remands the matter to EPA for "reconsideration in light of this opinion."<sup>54</sup>

Thus, Missouri and Georgia are not, as of now, included in the SIP Call. However, there is nothing in the opinion that would preclude EPA from a separate rulemaking to address control of NO<sub>x</sub> emissions in the two states. EPA could either propose NO<sub>x</sub> budgets based only on sources that are located within the fine grid portion of the models or it could propose statewide budgets. If EPA proposed statewide budgets, it would have to produce a record demonstrating that those sources "significantly contribute" to ozone nonattainment in downwind states. Figure 1 indicates how the geographic coverage of the SIP Call has been affected by the court's opinion and by subsequent EPA actions.

### **EPA's Motion to Lift Partial Stay**

On April 11, 2000, EPA filed a motion requesting that the D.C. Circuit Court lift its partial stay of the NO<sub>x</sub> SIP Call.<sup>55</sup> The court entered its order on this and related motions on June 22, 2000.<sup>56</sup> This order gives states 128 days from June 22, 2000 to file their revised SIPs with EPA. The court's rationale was that there were 128 days left for states to file when it entered its partial stay on May 25, 1999, and that the stay was only intended to "maintain the status quo pending a final determination of the merits of the suit."<sup>57</sup> Thus, revised SIPs were due to EPA by October 30, 2000.

EPA's April 11, 2000 motion is also of interest because it indicates how EPA intends to resolve certain issues where it did not prevail in the litigation. First, EPA noted that under the court's

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<sup>54</sup> *Id.* at 22 of 37.

<sup>55</sup> Motion is available at EPA's website: <<http://www.epa.gov/ttn/rto/sip>>.

<sup>56</sup> *Michigan v. EPA*, D.C. Circuit Court Docket No. 98-1497, Order dated June 22, 2000.

<sup>57</sup> *Id.*, citations omitted.



ruling, Wisconsin, Missouri, and Georgia have no obligations to submit revised SIPs until after EPA has completed further rulemaking.<sup>58</sup> Regarding “electrical generating units” and the level of control for “large stationary internal combustion engines,” EPA indicated that, until it completes further rulemaking, the states’ revised SIPs “may be based on budgets that do not reflect the assumed inclusion of emission reductions from sources affected by the remanded issues.”<sup>59</sup>

A footnote in EPA’s motion indicates that, although not specifically required to do so, EPA intends to treat Alabama and Michigan as it was ordered to treat Missouri and Georgia.<sup>60</sup> Recall that EPA was ordered to base the Missouri and Georgia budgets on sources located only within the fine grid portion of the OTAG models.<sup>61</sup> EPA sent letters<sup>62</sup> to the governors of Alabama and Michigan indicating that if these states send SIP revisions based on “partial budgets” (i.e., considering reductions from sources only in the fine grid portions of the state), then “EPA intends to propose to approve this plan as meeting your Phase I<sup>63</sup> SIP Call obligations.”

In association with its motion to lift the partial stay, EPA made one more statement that deserves careful attention:

If a state submits and EPA approves a SIP revision meeting all the requirements of both phases of the NO<sub>x</sub> SIP Call (including providing control measures to be in place by 2003), then EPA will withdraw the federal requirements for sources in that state subject to EPA’s rule responding to the [CAA] section 126 petitions.<sup>64</sup>

This statement, if it holds true, could be very significant. There are potentially many sources that are now subject to control under the Section 126 Petition Rule that would necessarily be subject to control under a state’s revised SIP.

## **SECTION 126 PETITIONS**

While the driver for the NO<sub>x</sub> SIP Call is the CAA’s mandate to address long range transport of pollutants that significantly contribute to nonattainment of NAAQS in downwind northeast states, a parallel driver has been the petition filed by certain states under Section 126 of the CAA. By having both the SIP Call and the Section 126 strategies in play at the same time, EPA was able to move forward the 126 Petition Rule while it was stayed from enforcing the SIP Call Final Rule.

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<sup>58</sup> *Michigan v. EPA*, D.C. Circuit Court Docket No. 98-1497, Motion filed by EPA on April 11, 2000, at 10.

<sup>59</sup> *Id.*, at 11.

<sup>60</sup> *Id.*, at 10 fn 8.

<sup>61</sup> The opinion would not prevent EPA from including sources in the coarse grid portion of the models, but EPA would first have to provide a sufficient basis for including these sources.

<sup>62</sup> See *Id.*, Attachments 5 and 6.

<sup>63</sup> EPA considers Phase I of the SIP Call to include all of the issues that it prevailed on in *Michigan v. EPA*. See Summary of EPA’s Approach to the SIP Call In Light of the March 3<sup>rd</sup> Court Decision, April 11, 2000, available at: <<http://www.epa.gov/ttn/rto/sip/related.html#doc>>.

<sup>64</sup> Summary of EPA’s Approach to the SIP Call In Light of the March 3<sup>rd</sup> Court Decision, April 11, 2000, at 3.

In an effort to push the OTAG and EPA to develop a viable resolution to the contribution of long range NO<sub>x</sub> emissions to their summer ozone woes, the northeasternmost eight states banded together to force the issue under the provisions afforded in Section 126 of the Clean Air Act. When read together with Section 110, Section 126 authorizes downwind states to petition the EPA for a finding that emissions from any new or existing major stationary source(s) in upwind states contribute significantly to nonattainment or interfere with maintenance of NAAQS in the petitioning state.<sup>65</sup> Once a petition is filed, the EPA must take action on the request within 60 days. If the requested finding is made, EPA is obligated to either shut down the contributing source(s) within 3 months, or establish emission limitations and a compliance schedule within 3 years to eliminate the prohibited interstate transport of pollutants.

In August of 1997, after OTAG had issued its recommendations and EPA was contemplating its next action, the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Pennsylvania, and Vermont filed petitions under Section 126. These petitions required EPA to make findings whether or not specific electric utility plants and other sources of NO<sub>x</sub> located in the midwest and southeast significantly contributed to ozone problems in the petitioning states.

The EPA responded by issuing the proposed NO<sub>x</sub> SIP Call rulemaking in October 1997 that, among other things, purported to provide a resolution to the petitioning states' demands. Then, to assure the northeastern states it would ultimately address the Section 126 petitions, the EPA signed a Memorandum of Understanding (MOU) with the petitioning states in December 1997 (which was subsequently turned into a Consent Decree) to establish a schedule for acting on the petitions. Under this MOU/Consent Decree, EPA committed to issue a proposed decision on the petitions by September 30, 1998, and take final action by April 30, 1999 in the event that the NO<sub>x</sub> SIP Call resolution had not yet been implemented.

In accordance with the terms of this MOU, EPA published an advance notice of proposed rulemaking on the petitions on April 30, 1998, and then issued the final NO<sub>x</sub> SIP Call rule on September 24, 1998. A few months later in a related matter, EPA proposed to revoke the 1 hour ozone NAAQS in furtherance of implementing the new 8 hour ozone standard in Maine, New Hampshire, Massachusetts, and Rhode Island. EPA fulfilled its final obligation by signing a final rule on April 30, 1999, determining that six of the eight petitions could be approved. This rule proposed a NO<sub>x</sub> credit trading program as the remedy to the approved Section 126 petitions and included a default remedy of automatically granting the petitions if the trading program is not implemented under the NO<sub>x</sub> SIP Call rule. It also included a finding that upwind states could remedy the problem targeted by the Section 126 petitions through timely submission and approval of their SIP revisions required under the NO<sub>x</sub> SIP Call.

EPA had essentially linked its Section 126 remedy onto its overall regional transport program being driven by the NO<sub>x</sub> SIP Call rulemaking and the stricter NAAQS. However, before its final Section 126 rule could be published, the District of Columbia Circuit Court of Appeals handed down the *American Trucking* decision remanding the 8 hour ozone standard and granted a partial stay on the NO<sub>x</sub> SIP Call rule in *Michigan*. The wheels of the regional transport program were suddenly coming off the train. So EPA issued a notice in June 1999 proposing a stay on its

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<sup>65</sup> CAA § 126(b), 42 U.S.C. 7426(b).

technical determinations of the petitions based on the (now remanded) 1 hour ozone standard and decoupling the Section 126 remedy from the NO<sub>x</sub> SIP Call. Then in October 1999, EPA proposed to reinstate the old 1 hour ozone standard, thereby restoring the basis for implementing emission controls under the now separate, but parallel, NO<sub>x</sub> SIP Call and Section 126 petitions remedies for addressing long range transport contribution to nonattainment in the northeast.

EPA's efforts to separate the Section 126 rulemaking from the legal entanglements of the NO<sub>x</sub> SIP Call was successfully confirmed on October 29, 1999, when the D.C. Circuit Court of Appeals denied a motion to stay the Section 126 rulemaking pending the outcome of the NO<sub>x</sub> SIP Call litigation. EPA now was free to pursue implementation of its long range transport initiative under the Section 126 procedures. However, by this time the northeastern states had opened another front in the battle to force reductions of emissions in downwind states by filing a citizen suit notice alleging violations of new source review permitting requirements at several downwind coal-fired power plants.

On November 7, 1999, EPA responded to the 60 day deadline by filing lawsuits against seven electric utility companies for violations at 17 different coal-fired power plants. Additionally, they issued an administrative order against the Tennessee Valley Authority for violations at seven of its plants and issued notices of violations to eight other utility plants. While full discussion of the implications of this new source review enforcement initiative is too voluminous for inclusion in this paper, this initiative is clearly aimed at achieving reductions in long range transport of NO<sub>x</sub> emissions. This is demonstrated by the EPA's underlying allegations that the defendants are now subject to the NSPS Subpart Da standard of 0.15 lb/MMBtu.

The final Section 126 rulemaking was published on January 18, 2000, in the Federal Register. Effective February 17<sup>th</sup>, this final rule granted the petitions of four states (Connecticut, Massachusetts, New York, and Pennsylvania) and limited the remedy to only address nonattainment of the 1 hour ozone standard. The default remedy was deleted and, in its place, a cap-and-trade program was proposed to be implemented beginning in 2003. Under this federal NO<sub>x</sub> Credit Trading Program, large electric generating units (EGUs) and non-EGU sources covered in the approved petitions would be allocated a set number of NO<sub>x</sub> allowances to authorize emissions during the summertime ozone season. Ultimately, 392 facilities will be required to reduce annual emissions by a total of nearly 510,000 tons from projected levels under this rule.

The different listed sources in the approved petitions were all combined into the overall allocation for existing sources. The allocation of allowances for affected EGUs was based on achieving a NO<sub>x</sub> emission rate of 0.15 lb/MMBtu as determined from their historic ozone season fuel consumption adjusted for growth to 2007. Some allocations were set aside for new sources in source categories found to be significantly contributing under the Connecticut, New York, and Pennsylvania petitions to use until new allocations can be made. Procedures for distributing allocations from a supplemental pool to sources having trouble achieving the desired 0.15 lb/MMBtu NO<sub>x</sub> emission rate during the first 2 years of the program were also outlined in the rulemaking.

The federal NO<sub>x</sub> Credit Trading Program proposed under the final Section 126 rule is closely aligned with the FIP proposed under the NO<sub>x</sub> SIP Call rulemaking. Both target emissions from EGUs with a nameplate capacity of 25 MW or more producing electricity for sale to the grid and are based on those sources achieving a NO<sub>x</sub> emission rate of 0.15 lb/MMBtu. The main difference is that the Section 126 NO<sub>x</sub> Credit Trading Program includes specific affected sources located in 12 states, while the NO<sub>x</sub> SIP Call rulemaking extends to all large EGUs located in 18 states and “fine grid” portions of four other states.