NATURAL RESOURCES JOURNAL

Volume 21
Issue 3 *Symposium on "Environmental Regulation and the U.S. Economy"*

Summer 1981

International-United States Air Pollution Control and the Acid Rain Phenomenon

Susan Brown

INTERNATIONAL-UNITED STATES AIR POLLUTION CONTROL AND THE ACID RAIN PHENOMENON

> Acid rain may be one of the most significant environmental problems of the coming decade. It poses new challenges to the full development of our forest, agricultural, and aquatic resources; and to the use of fossil fuels as an energy source. . . . [We must] assure that the Nation's energy needs are met without sacrificing environmental quality.[1]

INTRODUCTION

"Air pollution, like the air that carries it, knows no political boundaries."[2] The United States largely ignored that fact when, more than a decade ago, it sought to deal with the problem of air pollution through legislation. The Clean Air Act,[3] passed in 1970, was based on the premise that each state should have both the responsibility and the liberty to plan for and enforce air quality standards within its own boundaries. Now, recent scientific evidence has shown that certain pollutants travel in the atmosphere as far as several hundred kilometers per day, are converted through complex chemical reactions into acids, and return to the earth as components of precipitation—"acid rain."[4]

This newly discovered phenomenon has caused nationwide and international dispute. Northwestern states angrily blame midwestern states for coal fired pollution which is, they believe, contributing to the acidification of lakes, killing fish, damaging buildings, and possibly reducing some crop and forest yields.[5] Canada fears that increases in pollutant emissions in the United States will cause irreversible damage to its tourist, sport, and commercial fishing industries as

---

1. Stephen J. Gage, Asst. Admin. for Research and Development, U.S. Envt'l Protection Agency, *quoted in* U.S. ENVT'L PROTECTION AGENCY, RESEARCH SUMMARY: ACID RAIN frontispiece (1979).

2. *Clean Air Act and Increased Coal Use: Environmental Protection Agency Oversight: Hearing Before a Subcomm. of the Comm. on Gov't Operations*, 96th Cong., 1st Sess. 231 (1979) (remarks of Ruth Clusen) [hereinafter cited as *Clean Air Act and Increased Coal Use*].

3. 42 U.S.C. § § 1857-1858 (1976) (amended 1977).

4. *See generally* U.S. ENVT'L PROTECTION AGENCY, *supra* note 1.

5. Albuquerque Tribune, May 27, 1980, § C, at 5.

well as to public buildings and monuments;[6] both Sweden and Norway suffer from acid rain originating in the rest of Europe.[7]

Although all countries are being forced to reconsider their air pollution control policies in view of the occurrence of acid rain, little has been done in any country to implement procedures which could ensure abatement of the problem. One particular difficulty has been the lack of adequate scientific knowledge concerning the source and the implications of acidity in the environment. To some extent, this lack of knowledge is due to a poor record of interest.

In the United States, particularly, interest in the acid rain problem has been sporadic and intermittent until very recently.[8] Few programs have been set up for collection and chemical analysis, and none provide the spatial coverage of the varied climatic and land use zones of the United States.[9]

Europe, by contrast, has a longer history of research into the chemistry of precipitation. In the 1950s, acid was first noticed in samples collected from the European Air Chemistry Network.[10] By 1968 studies showed that an area with highly acid precipitation was expanding year by year and related this occurrence to the acidification of rivers and lakes observed in Scandinavia.[11] Sulfuric acid was the main acid component in the precipitation and was accompanied by soot fly-ash and tar-like substances which occassionally gave snow a grayish tint.[12] The source of the problem was thought to be the increasing use of sulfur-containing fuels.[13]

These observations in Europe caused alarm, prompting several countries to undertake full scale investigation into the acid rain phenomenon.[14] But decades of research have not yet brought the scientific community to universally accepted conclusions about either the source of acid rain or its effects.

Nevertheless, certain matters are generally agreed upon. For example, sulfur and nitrogen oxides are believed to be the major precursors of acid rain, though other constituents may contribute to the

---

6. *Id.*
7. *Id.*
8. Pack, *Acid Precipitation–a Problem in Meteorological Physics/Chemistry*, in ENVIRONMENTAL AND CLIMATIC IMPACT OF COAL UTILIZATION 576 (J. Singh & A. Deepak eds. 1980) [hereinafter cited as ENVIRONMENTAL AND CLIMATIC IMPACT].
9. *Id.*
10. Ottar, *An Assessment of the OECD Study on Long Range Transport of Air Pollutants (LRTAP)*, in SULFUR IN THE ATMOSPHERE 445 (R. Husar, J. Lodge & D. Moore eds. 1978).
11. *Id.*
12. *Id.*
13. *Id.*
14. *Id.*

problem.[15] Sulfur and nitrogen act in various ways to produce highly water soluble acid. After emission into the atmosphere, these pollutants may be converted into sulfates and nitrates (sulfuric and nitric acids) through a highly complex oxidation process.[16] Several factors can influence the process through which this oxidation takes place: the intensity of sunlight, the concentration of heavy metals, and the amount of ammonia present.[17] The resultant sulfates and nitrates may be deposited through rain or snow.[18] This process is generally referred to as wet deposition.

Acidity may also occur in the environment as a result of another atmospheric process known as dry deposition. In this process, particles such as fly-ash or gases such as sulfur dioxide or nitric oxide are deposited onto land or water surfaces.[19] Once deposited, the particles or gases may become acidic after contacting water in the form of rain, dew, fog or mist.[20]

Both natural emissions and man-made emissions affect the acidity in the atmosphere.[21] Natural sources include aerosol generation from sea spray, emissions from soil and vegetation, and single events such as volcanic eruptions and forest fires.[22] The majority of man-made emissions are caused by fossil fuel combustion and smelters.[23]

The difficulty of making precise conclusions about the occurrence of acid rain is due to the complexity of the process through which it occurs, the various factors which might affect that process, and the contributions of both man-made and natural emissions to acidity.

Moreover, the exact effects of acid rain on environmental and ecological surroundings are unclear, at best, and are dependent upon several factors: the nature and amount of emissions; atmospheric chemistry; transport and deposition of gases; and the geochemical and biological nature of the receiving area.[24] Nevertheless, there is documentation of adverse effects to soils, forests, and fisheries in Europe

15. U.S. ENVT'L PROTECTION AGENCY, *supra* note 1, at 2.
16. *Id.*
17. *Id.*
18. *Id.* at 3.
19. *Id.*
20. *Id.*
21. Kramer, *Acid Precipitation,* in SULFUR IN THE ENVIRONMENT 328 (J. Nriagu ed. 1978).
22. *Id.*
23. The National Coal Association forecasts an increase in the use of coal from 444 million tons in 1976 to about 850 million tons in 1985. "[C]onventional power plants, fired by pulverized coal are the largest single anthropogenic source of atmospheric fine particles and sulfur oxides and the second largest source of nitrogen oxides." Ondov & Bierman, *Physical and Chemical Characterization of Aerosol Emissions from Coal Fired Power Plants,* in ENVIRONMENTAL AND CLIMATIC IMPACT, *supra* note 8, at 2.
24. Kramer, *supra* note 21, at 327-28.

and North America and, while debate continues as to precise effects, obviously the negative impact can be severe under particular circumstances.[25]

Tragically, the impact of acid in the environment is patently irreversible. In the case of lake acidification, lime has been added to waters in an effort to retard acid concentration.[26] But the result has not been favorable. "[I]f you take an acid lake and lime it, you do not now have a normal lake; you now have a limed, formerly very acid lake, with a very peculiar water chemistry and a very peculiar biota as a result."[27]

Acid rain cannot be ignored as a major air pollution problem, but scientific dispute as to its source and effects has made it difficult to determine what mechanisms might be employed to abate it. Legislators have been reluctant to make any such determinations until the phenomenon is more fully understood. Many areas of North America and Europe, however, are experiencing precipitation 25 to 40 times as acidic as natural rain[28] and legislators should no longer delay providing at least some protection from further acidification of the atmosphere and environment.

INTERNATIONAL LAW

Problems resulting from the transport of air pollutants across political boundaries have historically arisen in an international context. Because acid rain often occurs as a consequence of transboundary air pollution, international law may be a starting point from which legislators might approach the problem.

At one point in history, it was commonly accepted that one state could use its water or air for any purpose, irrespective of the fact that it might cause harm to other states.[29] But several factors—the growing interdependence of states, the development of industrial production, the increasing risks of pollution, the rapid growth in world population, and the attendant rise in consumption—encouraged

25. Hales, *Wet Removal of Sulfur Compounds from the Atmosphere,* in SULFUR IN THE ATMOSPHERE, *supra* note 10, at 390.

26. Gains, *The Mystery of Acid Rain,* 11 CONOCO 13 (1980).

27. Wetstone, *Air Pollution Control Laws in North America and the Problem of Acid Rain and Snow,* 10 ENVT'L L. RPTR. 50001, 50003, *quoting* STANDING RESOURCES DEVELOPMENT COMMITTEE OF ONTARIO, INTERIM REPORT ON ACIDIC PRECIPITATION, ABATEMENT OPERATIONS AT SUDBURY, AND POLLUTION CONTROL IN THE PULP AND PAPER INDUSTRY 19 (1979).

28. *Id.* at 50001.

29. Stein, *Legal and Institutional Aspects of Transfrontier Pollution Control,* in PROBLEMS IN TRANSFRONTIER POLLUTION 289 (1974).

the adoption of the principle that one state should not use its territory to harm others.

This principle was originally invoked in 1941, when an international tribunal specifically addressed the issue of transboundary pollution.[30] The tribunal examined United States claims that a Canadian smelter was emitting fumes that sent sulfur dioxide into the United States, causing damage to trees and crops. The tribunal held that "under the principles of international law, as well as the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established."[31] The smelter was not shut down, but the tribunal relied on principles of equity to establish a regime to govern its continued operation.

While this recognition of one state's responsibility to others has been evolving since 1941, states have been reluctant to develop cooperative efforts to prevent and repair any damage to commonly shared water ways and air spaces.[32] This is particularly true in the case of acid rain whose effects lack firm scientific evidence. Despite recent international agreements concerning acid rain,[33] worldwide coal burning is on the increase and few industrial countries are willing to invest the necessary capital in air pollution control technology.

Controlling transboundary pollution on an international level is particularly difficult in light of complex political, economic and social considerations. Setting international environmental protection or emission standards, for example, is workable only where the countries have the same social and economic structures; the same values and preferences; the same environmental background; and the same economic capabilities.[34] Moreover, even if differences could be pro-

30. U.S.A./Canada (Trail Smelter Arbitration), 3 U.N. REP. INT'L ARB. AWARDS 1938 (1941).

31. *Id.* at 1965.

32. Stein, *supra* note 29, at 289-90.

33. On November 16, 1979, 34 member countries of the U.N. Economic Commission for Europe signed the "Convention on Long Range Transboundary Air Pollution," providing for the sharing of information, collaborative research, and continued monitoring of pollutants and precipitation. It contains no definitive goals, limits, timetables, abatement measures or enforcement provisions.

On June 30, 1980, the Council of European Communities enacted an international directive concerning sulfur dioxide. The directive is so weak, however, that member countries are able to comply with it by only slightly changing present practices–and with no measurable impact on acid rain. Albuquerque Journal, Jan. 1, 1981, § C, at 8.

34. Muraro, *The Economics of Unidirectional Transfrontier Pollution*, in PROBLEMS OF TRANSFRONTIER POLLUTION, *supra* note 29, at 46-47.

vided for in the setting of international standards, an even more difficult problem would be developing the means to ensure compliance.

Theoretically, promoting compliance could be accomplished in several ways, but most effectively through registration or licensing regulations or the imposition of liability as a deterrent to violation.[35]

Development of international registration or licensing procedures, however, encounters many difficulties: the sensitivities of governments concerning the information involved; the determination of criteria for what should be reported or registered; administrative and technical complexities in the collection and processing of the information; and assuring the compatability of information coming from many sources.[36] It is not entirely clear that these difficulties can be overcome, even in the most carefully designed regulatory scheme.

The imposition of liability as a deterrent also has its practical limitations.[37] The usefulness of liability as a means of ensuring compliance requires that it be possible to show that particular damages were caused by pollutants from a particular source.[38] This limitation is serious even on the international level, particularly in the case of acid rain where knowledge is incomplete, where many polluters may be contributing to one pollution problem, and where synergistic effects may be occurring. In terms of organizational difficulties, existing international organizations can provide a ready forum for the imposition of liability, but the states must be willing to take such action.

An international solution to transboundary pollution and the problem of acid rain may not be possible, absent the creation of a centralized authority evaluating the problem from an international viewpoint. While it would, perhaps, be ideal to give such an authority full responsibility to set standards, regulate and enforce violations, the practical considerations discussed above would discourage such responsibility.

In fact, the creation of such an international authority is certainly unlikely given present-day political considerations. Consequently, control of transboundary air pollution and resultant occurrence of acid rain would best be approached at a national, rather than an international level.

UNITED STATES LEGISLATION–THE CLEAN AIR ACT

Presently no direct authority exists in the United States for the control of acid rain. Growing concern, however, may cause the prob-

35. *See generally* U.N. INST. FOR TRAINING & RESEARCH, INTERNATIONAL COOPERATION FOR POLLUTION CONTROL (1972).
36. *Id.*
37. *Id.*
38. *Id.*

lem to emerge as a major issue in the 97th Congress.[39] Generally, legislators agree that the most likely authority through which the problem will be addressed is the Clean Air Act.[40]

Although the acid rain problem is unique, and its control will require measures different from those traditionally employed in air pollution control, it is unlikely that legislation apart from the Clean Air Act will be considered. The introduction of separate legislation would require that the Act be totally revised. If regulation of acid rain is to be effective and delay in its abatement to be avoided, the better solution is a restructuring of the Act to provide a coordinated plan for the regulation of all sources that emit pollutants of any kind into the atmosphere. Because fossil fuel-burning plants are one source of acid rain and are presently regulated under the Clean Air Act, it would be most practical and efficient to coordinate the control of all pollutants—including sulfates and nitrates—under that Act.

Statutory Scheme

An examination of the Clean Air Act with its present amendments indicates that the Environmental Protection Agency (EPA) is provided with at least some indirect authority to deal with the problem of acid rain. But the basic premise of the act does not account for long range transport of pollutants. Instead, it was based on the assumption that concentrations of primary pollutants at some distance from the source would become indistinguishable from the natural environmental background.[41] Only within the last decade has it been realized that chemical transformation generating secondary pollutants—and acid rain—becomes of concern at greater distances.

---

39. 4 INT'L ENVIR. REP. (BNA) 632 (1981).

40. 42 U.S.C. §§ 7401-7642 (Supp. II 1978). Other legislation could conceivably be applied to control the acid rain problem. For example, the objective of the Water Pollution Prevention and Control Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a) (1976). But that Act regulates only direct discharges into waters and would probably not apply to diffuse sources such as acid rain.

Control of acid rain might also come under the ambit of the Endangered Species Act, 16 U.S.C. §§ 1531-1543 (1976 & Supp. III 1979). A species may be determined to be endangered or threatened because of: the present or threatened destruction of its habitat or range; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence. *Id.* § 1533(a)(1) (1976). Once such a determination is made regulations may be issued as "necessary and advisable to provide for conservation of the species." *Id.* § 1533(d) (1976).

Under the Endangered Species Act, then, acid rain that threatens certain species of fish and their habitats might be controlled. However, the act would seem to have little practical applicability because of the difficulty of proving that the threat to a particular species is caused by pollutants emitted from a particular source. In addition, the Endangered Species Act may be pre-empted functionally by the Clean Air Act.

41. *Clean Air Act and Increased Coal Use, supra* note 2, at 88 (paper by Walter A. Lyons).

The Clean Air Act was conceived as a means for setting and enforcing ambient air standards. It provides primarily for designation of interstate air quality control regions;[42] issuance of air quality criteria and information on air pollution control techniques;[43] the establishment of national ambient air quality standards (NAAQS) for major pollutants;[44] the preparation of state implementation plans (SIPs) by the individual states for enforcement of these national standards;[45] review and revisions of the SIPs by the EPA;[46] and enforcement of the state implementation plans.[47]

This basic structure does not provide for the direct control of pollutants across state boundaries. Air quality control regions are to be designated by the EPA administrator for any intrastate or interstate area which he "deems necessary or appropriate for attainment and maintenance of ambient air quality standards."[48] While this provision recognizes that air pollution problems are not responsive to political boundaries, the practical effect of other provisions is to make pollution control an entirely intrastate matter. In fact, the act provides only for the *designation* of air quality regions; but, regions have no responsibility for setting, enforcing or planning for standards.

Instead, each state has the primary responsibility for assuring air quality within the entire geographic area comprising the state. The act requires the preparation by each state of a plan which provides for implementation, maintenance and enforcement of national air quality standards.[49] Although such state implementation plans are to include considerations of interstate impact, plans that are state conceived, state drafted, and state enforced are rarely responsive to the varying demands of different air quality control regions within that state. Additionally, within its SIP, each individual state is at liberty to adopt whatever mix of emission limitations it deems best suited to its particular situation, as long as the ultimate effect is compliance with the national standards.[50]

Tall Stack Policy

EPA was required, under the original Clean Air Act, to approve a SIP if it determined that the plan included measures necessary to in-

42. 42 U.S.C. § 7407 (Supp. II 1978).
43. *Id.* § 7408.
44. *Id.* § 7409.
45. *Id.* § 7410.
46. *Id.*
47. *Id.* § 7413.
48. *Id.* § 7407(c).
49. *Id.* § 7410.
50. *See* Train v. Natural Resources Defense Council, Inc., 421 U.S. 60 (1975).

sure attainment of the applicable national standards.[51] Initially, EPA permitted plans to authorize tall stacks and other dispersion techniques as a means of attaining or maintaining compliance with the standards.[52] But subsequent judicial decisions[53] declaring such a practice to be inconsistent with the requirements of the Act prompted EPA to alter its policy. In early 1976, EPA promulgated guidelines which prohibited the use of stack height instead of emission reduction, but still encouraged tall stacks as a means of further minimizing the effects of emissions on ground level concentrations.[54] If any source applied the best available technology, it would be credited for the full dispersive effect of its tall stack.[55] While the guideline was an attempt to recognize long range transport of air pollutants, it had insubstantial effect on the reduction of stack heights.

In the Clean Air Act Amendments of 1977, Congress sought to further restrict stack heights by requiring that the degree of emission limitation required for control of any air pollutant "shall not be affected in any manner by so much of the stack height . . . as exceeds good engineering practice [GEP]."[56] Under section 123, a GEP stack height is not to exceed two and a half times the height of the source, unless the owner or operator of the source can demonstrate that a greater height is "necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source."[57] EPA interprets this section to require emissions from all sources built after 1970 to be modeled as though emissions proceeded from GEP stack heights, when determining the limitations to be imposed on new facilities.[58] In such a way, the degree of emission limitations cannot be reduced by the fact that neighboring pre-existing sources with tall stacks disperse their emissions over a broader region, resulting in lower concentrations in the immediate vicinity,[59] but exacerbating the acid rain problem.

Regardless of this more strict stack height policy, however, regula-

51. 42 U.S.C. § 1857c-5(a)(2)(B) (1976) (amended 1977).

52. *See* 37 Fed. Reg. 10,859 (1972).

53. *See* Kennecott Copper Corp. v. Train, 526 F.2d 1149 (9th Cir. 1975); Big Rivers Elec. Corp. v. EPA, 523 F.2d 16 (6th Cir. 1975); Natural Resources Defense Council v. EPA, 489 F.2d 390 (5th Cir. 1974).

54. U.S. Envt'l Protection Agency, Legal Interpretation and Guidelines Concerning Stack Height Increases as a Means of Meeting Federal Ambient Air Quality Standards (1976).

55. *Id.*

56. 42 U.S.C. § 7423(a)(1) (Supp. II 1978).

57. *Id.* § 7423(c).

58. 42 Fed. Reg. 57,460 (1977). The EPA interpretation was upheld by the Federal District Court for the District of Columbia in *Alabama Power Co. v. Costle*, No. 78-1006 (D.D.C. Dec. 14, 1980).

59. Albama Power Co. v. Costle, No. 78-1006, at 40 (D.D.C. Dec. 14, 1980).

tory incentives for the construction of tall stacks have not entirely been removed. For example, the tall stacks policy is not applicable to stack heights in existence before 1971 or other dispersion techniques implemented prior to that date.[60] There is also a limited exemption for coal fired electric generating facilities,[61] which may be major contributors to the occurrence of acid rain. In addition, sections 113 and 119 of the Act permit some use of dispersion techniques under specified conditions.[62] In light of these provisions, the limited restrictions on stack height are not an effective means of reducing long range transport of pollutants.

Moreover, the guidelines will have little effect on the use of tall stacks if EPA fails to require a detailed demonstration of the need for taller stacks at existing facilities. It is conceivable that EPA, lacking the substantial resources necessary to develop and evaluate case-by-case demonstrations, may routinely approve increases in stack heights at existing power plants and industrial facilities.[63]

Ambient Air Quality Standards

State implementation plans are required only for pollutants for which ambient air quality standards are set.[64] Presently, standards exist for seven "criteria" pollutants including sulfur dioxides and nitrogen oxides.[65] Emissions of these two pollutants are ultimately transformed into sulfates and nitrates, the direct precursors to acid rain. More stringent standards for sulfur dioxides and nitrogen oxides would necessarily result in the reduction of acid rain, but the most direct and effective control requires that standards be set for sulfates and nitrates.

While the act requires that standards be set for pollution emissions from numerous sources that might endanger public health or welfare,[66] EPA has been reclutant to set standards for sulfates and nitrates. Determination of ambient air quality standards requires the development of a data base from which the standard can be justified. In the case of acid rain, particularly, developing the necessary data is both difficult and time consuming. Because of technical limitations, it is nearly impossible to establish a cause and effect relationship

60. 42 U.S.C. § 7423(a) (Supp. II 1978).
61. *Id.*
62. *Id.* § 7413, 7419.
63. *Clean Air Act and Increased Coal Use, supra* note 2, at 16 (statement of Robert J. Rauch).
64. *See* 42 U.S.C. § 7410 (Supp. II 1978).
65. RODGERS, ENVIRONMENTAL LAW 225 (1977).
66. 42 U.S.C. § 7409 (Supp. II 1978).

when long range transport of pollutants is a factor.[67] Single sources are rarely to blame for the air pollution problems in a neighboring state. More often, urban plumes or effluents from industrial complexes create the problem.[68] Moreover, when chemical transformation in the atmosphere occurs, both modeling and traceability become more difficult.[69]

Even if standards for sulfates and nitrates were set, their enforcement may not be the most reasonable method of controlling acid rain. The rate of oxidation may be a more important factor than the amount of emissions.[70] Moreover, the control of either nitrates or sulfates may increase the effect of the other.[71]

Nevertheless, designation of a pollutant as a criteria pollutant is necessary to trigger other sections of the Clean Air Act that are intended to deal directly with the problems of transboundary pollution. For example, section 110 requires state implementation plans to prohibit interference by any source within the state with the implementation plan of another state.[72] In addition, section 126 provides for interdiction against operation of any source which violates the prohibition in section 110.[73] Since SIPs are required only for pollutants for which ambient air quality standards are set, and since sections 110 and 126 establish requirements for SIPs, coverage of those sections is thought to be legally limited to pollutants for which standards exist.[74] Because no standard for sulfate or nitrate exists, then, EPA may be powerless to use the interstate pollution provisions as a means for abatement of the acid rain problem.

New Source Performance Standards

Under the present Clean Air Act Amendments, the best vehicle available to approach the acid rain problem may be section 111.[75] Through this section, new sources built after 1970 are subject to strict new source performance standards (NSPS). Sources built prior to 1970, on the other hand, are required to reduce their emissions only if they are interfering with the attainment or maintenance of

67. *Clean Air Act and Increased Coal Use, supra* note 2, at 232 (remarks of Ruth Clusen).
68. *Id.*
69. *Id.*
70. 11 ENVIR. REP. (BNA) 299-300 (1980).
71. *Id.*
72. 42 U.S.C. § 7410(a)(2)(E) (Supp. II 1978).
73. *Id.* § 7426.
74. *Clean Air Act and Increased Coal Use, supra* note 2, at 163 (memorandum from Michael A. Jones).
75. 42 U.S.C. § 7411 (Supp. II 1978).

the NAAQS. But because regulated pollutants under section 111 are not limited to criteria pollutants, EPA clearly has authority to control emissions of sulfates and nitrates from sources built after 1970.

In addition, section 111(d) permits EPA to require that states adopt emissions limitations for existing sources of noncriteria pollutants if new source performance standards have been set for those pollutants. Rather than establishing an ambient air quality standard, then, for sulfates and nitrates, EPA could set NSPS and require states to adopt emissions limitations even for existing sources of those pollutants. EPA, however, is as reluctant to set NSPS for sulfates and nitrates as it is to designate them as criteria pollutants.[76] The effect of the present EPA policy on NSPS, then, is to allow power plants built prior to 1970 to emit large percentages of sulfur dioxide, exacerbating problems of interstate pollution and, ultimately, becoming major contributors to the occurrence of acid rain.

Visibility Goals

Two other sections of the present Act provide at least indirect authority to EPA with which to deal with the acid rain problem. Sections 165[77] and 169A[78] authorize EPA to promulgate regulations that would protect visibility in national park areas. EPA could require both new and existing sources to control emissions to meet national visibility goals, which at the same time would reduce long range transport of pollutants. Of course, these sections would have only limited applicability to the acid rain problem in general because they provide protection only in national park areas.

International Air Pollution

Section 115 of the act[79] provides for consideration of international air pollution problems. Under that section, EPA can order specific emissions limitations for any air pollutant if the pollutant endangers the health or welfare of a foreign country. But before the limitations can be ordered, the endangered country must provide a reciprocal agreement concerning emissions that might harm the United States. This requirement makes the section particularly cumbersome to implement. For example, the Canadian Parliament recently amended legislation to provide that its government can adopt emissions standards for sources that contribute to air pollution problems in another

76. *See* 11 ENVIR. REP. (BNA) 328 (1980).
77. 42 U.S.C. § 7475(e)(3) (Supp. II 1978).
78. *Id.* § 7491.
79. *Id.* § 7415.

country.[80] Nevertheless, this authorizing legislation does not necessarily give the Canadian Government ample power to reciprocate essentially the same rights offered by the United States. Further, EPA must determine that the Government of Canada will exercise or interpret the authority in a manner that provides essentially the same rights.[81] The implementation of section 115, then, would involve a great deal of time—time in reaching an agreement with another country for reciprocal rights and time in determining whether an agreement actually provides for the receipt of the same rights given.

Proposed Amendments

Apparently, EPA has at least some indirect authority under the present Clean Air Act to deal with the acid rain problem. The agency has discretion over several matters that could affect the occurrence of acid rain: strict enforcement of state implementation plans, denial of SIP relaxations, and strengthening of compliance monitoring and enforcement. A policy decision by EPA to strictly enforce existing sulfur dioxide and nitrogen oxide emission limitations is necessary now in order to have an appreciable effect on the occurrence of acid rain in the near future.

The current sulfur dioxide control strategy, however, is not sufficient to have any long range impact on the abatement of acid rain. Even if industry were unable to successfully challenge EPA's authority, present provisions of the act are so cumbersome to implement that emissions would not be affected for at least a decade.[82]

Because the Clean Air Act is based upon assumptions that clearly do not account for the acid rain phenomenon, abatement of the problem requires that the act be amended. The state responsibility approach must necessarily be reconsidered. It can no longer be assumed that states will be responsive to the varying demands of air quality regions outside as well as within the state. Thus current state implementation plan procedure should give way to a regional, or even national system, whereby all sources would be required to achieve a certain percentage reduction of emissions per year.

In addition, it is necessary to require older power plants that are exempt from NSPS to be retrofitted or phased out of operation. Researchers have determined that—even if NSPS were more rigorous—the "predominant source of sulfur dioxide emissions through the year 2000 would continue to be power plants built prior to 1970 and

80. 4 INT'L ENVIR. REP. (BNA) 684 (1981).
81. *Id.*
82. 11 ENVIR. REP. (BNA) 328 (1980).

thus not subject to new source performance standards . . . 89 percent of the sulfur dioxide emitted in 1985 will continue to come from sources built prior to 1970."[83] These sources, then, exacerbate the acid rain problem—in fact, are major contributors to the problem. The present regulatory scheme, then, must be amended in order to control them more strictly and effectively.

Additionally, EPA has historically tended to leniency in its enforcement;[84] an amendment of the act may be required that would impose court standards should the legislative process fail to reduce emissions. Since the enactment of the act, EPA has been under constant pressure to relax emission limitations, particularly for existing coal-fired plants.[85] During 1975 and 1976 EPA was directed by Congress to review all existing SIPs to determine whether they were more stringent than necessary to meet national standards.[86] Dozens of SIPs were relaxed. Issues involved in SIP revisions are not always black and white. Outside pressures (a recent congressional mandate to use coal as a primary energy source,[87] for example) may encourage EPA to bend its own guidelines. Amending the act to provide for the direct control of acid rain will not ensure abatement if EPA fails to enforce regulations strictly. Thus, to make certain that the problem is handled effectively, an amendment providing court imposed standards is necessary.

CONCLUSION

The problem of acid rain must be approached without much further delay. Because its effects have proven to be irreversible in certain cases, the solution must be in its prevention. While the issue of transboundary pollution originated in an international context, international solutions may be politically impossible to implement given the potential magnitude of the acid rain problem. The most efficient and effective measures, then, must be taken at a national level. And as each nation takes steps to abate the occurrence of acid rain within its own boundaries, long range transport of pollutants across national boundaries will be necessarily diminished.

In the United States, present legislation is ineffective for the abatement of long distance transport of pollutants and the resultant occur-

83. *Clean Air Act and Increased Coal Use, supra* note 2, at 11 (statement of Robert J. Rauch).

84. *See id.* at 10-23.

85. *Id.* at 14.

86. *Id.* at 15.

87. *See* Powerplant and Industrial Fuel Use Act, 42 U.S.C. §§ 8301-8483 (Supp. II 1978).

rence of acid rain. With the exception of the criteria pollutants, the Clean Air Act is oriented toward control of new as opposed to existing facilities. Sulfates and nitrates are not even addressed. Even if sections of the act can be construed in such a way as to deal with acid rain, implementation of those sections is a cumbersome process. Moreover, EPA must strictly enforce the act and its amendments.

In fact, timely abatement of the acid rain problem requires that EPA take the following measures now: 1) strengthen compliance monitoring and enforcement, 2) deny SIP relaxations, 3) tighten and strictly enforce sulfur dioxide and nitrogen oxide emission limitations. And in order to ensure long range effectiveness of acid rain abatement, the Clean Air Act must be amended. The present state responsibility approach must give way to a regional or national system. Power plants built before 1970 that are presently exempt from NSPS must be retrofitted or phased out of operation. Finally, the act should provide for court imposed standards where the legislative process fails to effectively deal with the acid rain problem.

The Clean Air Act is to be reauthorized during 1981. Unfortunately, the new administration of President Ronald Reagan seems more sympathetic to industry than environmentalism, as compared to prior administrations. Apparently, it will firmly encourage the burning of coal[88]—and, because the Clean Air Act presents an obstacle to the expansion of coal use, existing clean air regulations may be eased rather than strengthened.

Acid rain can no longer be ignored as a threat to environmental quality. But pressures to strengthen legislation that can account for the acid rain problem will go unheeded, unless the U.S. government is committed to clean air and the environment.

SUSAN BROWN

88. Denver Post, Nov. 27, 1980, § CC, at 22, col. 6.