12-2005 35 ELR 10807

ELR
NEWS & ANALYSIS

ARTICLES

Preventing Significant Deterioration Under the Clean Air Act: Baselines, Increments, and Ceilings—Part I

by John-Mark Stensvaag

Editors' Summary: The CAA's PSD program is extraordinarily complex. This Article, written in two parts, focuses on the root of the PSD implementation process—baselines, increments, and ceilings. After exploring the essential features of baselines, increments, and ceilings, Prof. John-Mark Stensvaag delves into the complications that clutter up the theoretical simplicity of these features—complications flowing from statutory drafting, regulatory drafting, and interpretative choices made during the first 30 years of the program. Part I, presented below, examines the random, chaotic nature of the baseline date creation process. Part I also looks at baseline areas, which have a profound impact on when the baseline and ceiling concentrations are established and when the increment consumption clock begins to run. Despite the importance of this geographic PSD component, the CAA provides little guidance on the baseline area issue. Part II of the Article, which will appear in the January 2006 issue of News & Analysis*, will examine baseline concentrations, ceilings, and increment consumption, and will provide the author's final thoughts and recommendations.*

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I. Introduction

Approximately 30 years have passed since the Clean Air Act's (CAA's) prevention of significant deterioration (PSD) program was mandated by the courts,[1] created out of thin air by the U.S. Environmental Protection Agency (EPA),[2] ratified (with modification) by the U.S. Congress,[3] revised by EPA to comply with the statutory directives,[4] and revised yet again by the Agency[5] following judicial review.[6] Born of a simple notion—that air quality in pristine areas of the nation should not be degraded to the levels otherwise permitted by national ambient air quality standards (NAAQS)—the PSD program has morphed into a regime of extraordinary complexity.[7]

How has this program been implemented? How does today's real-world PSD program correspond to the structure initially invented by EPA and codified by Congress?[8] A healthy dose of humility is in order here.

The true contours of PSD implementation could be discerned only by reading tens of thousands of documents associated with many hundreds of PSD permits—documents and permits scattered throughout the nation. It would not be enough to examine PSD permits alone. Only by poring through permit applications, monitoring reports, letters, briefs, memoranda, draft permits, consultant reports, agency minutes, and administrative opinions could one begin to understand the numerous interpretative choices that have led to the issuance of and conditions in a given PSD permit (or to a determination that no permit is necessary). Such documents do not necessarily reside in file cabinets devoted exclusively to PSD permits. At the Minnesota Pollution Control Agency, for example, PSD permits and associated documents are thoroughly mixed with countless other documents having to do with air quality—a situation making perfect sense to regulators but dashing the hopes of scholars.

Thus, it is probably impossible for a mere mortal to speak definitively about how the PSD program has been implemented. Nevertheless, some things may be learned by reviewing the statutory language, EPA regulations, the thousands of *Federal Register* documents, and the hundreds of judicial and administrative opinions that make up the more readily available public face of the program. This Article, presented in two parts, seeks to address what this more limited database tells us about one aspect of PSD implementation: baselines, increments, and ceilings.[9]

Alfred Lord Tennyson's famous line from *Ulysses*: "I am a part of all that I have met,"[10] is also true in reverse: "I am apart from all I have not met." Through almost 30 years of practicing, teaching, and writing about environmental law, I have learned that one's "initial understanding of each modern environmental control scheme is misleading, because the scheme will be shown to be vastly different once the fine print has been explored."[11] The research leading to this Article has been yet another reminder that initial understandings of core environmental law programs may be misleading and superficial.

II. A Simplistic, Theoretical Overview

This Article first explores the essential features of baselines, increments, and ceilings at a relatively simplistic, theoretical level. It then turns to the complications that clutter up the theoretical simplicity of these features—complications flowing from statutory drafting, regulatory drafting, and interpretative choices made during the first 30 years of the program.

1. *See* Sierra Club v. Ruckelshaus, 344 F. Supp. 253, 2 ELR 20262 (D.D.C. 1972), *aff'd without opinion*, 4 Env't Rep. Cas. (BNA) 1815 (D.C. Cir. 1972), *aff'd by an equally divided Court sub nom.* Fri v. Sierra Club, 412 U.S. 541, 3 ELR 20684 (1973).
2. EPA's initial regulations, published at 39 Fed. Reg. 42514 (Dec. 5, 1974), were formerly codified at 40 C.F.R. §52.21 (1977).
3. *See* Pub. L. No. 95-95, §127, 91 Stat. 685, 731-42, enacting CAA §§160-169B, 42 U.S.C. §§7470-7492 (1977).
4. *See* 43 Fed. Reg. 26380 (June 19, 1978), formerly codified at 40 C.F.R. §51.24 (1978); 43 Fed. Reg. 26388 (June 19, 1978), formerly codified at 40 C.F.R. §52.21 (1978). EPA's PSD regulations are echoed in two places: 40 C.F.R. Part 51 (setting forth the items that must be included in any state implementation plan (SIP) or tribal implementation plan for a state or Native American tribe wishing to take over and administer the PSD program), and 40 C.F.R. Part 52 (setting forth the PSD requirements applicable in those states or Native American nations whose PSD programs have not been approved by EPA).
5. *See* 45 Fed. Reg. 52676 (Aug. 7, 1980) (formerly codified at 40 C.F.R. §§51.166, 52.24 (1980)).
6. *See* Alabama Power Co. v. Costle, 636 F.2d 323, 10 ELR 20001 (D.C. Cir. 1979); Alabama Power Co. v. Costle, 606 F.2d 1068, 9 ELR 20400 (D.C. Cir. 1979). For a brief history of the PSD program's birth pangs, see Craig N. Oren, *Prevention of Significant Deterioration: Control-Compelling Versus Site-Shifting*, 74 Iowa L. Rev. 1, 10 (1988).
7. *See Clean Air Act Oversight Part 1: Hearings Before the Senate Comm. on Environment and Public Works*, 97th Cong. 105-07 (1981) (remarks of Sen. Pete V. Domenici (R-N.M.)) ("I just can't believe something as complicated as this is necessary to preserve areas from deterioration."), *reprinted in* Oren, *supra* note 6, at 1.
8. In four excellent articles published near the time of initial codification, seasoned environmental attorneys explained how they expected the PSD program to operate. *See* Bradley I. Raffle, *The New Clean Air Act—Getting Clean and Staying Clean*, 26 Env't Rep. (BNA) (May 19, 1978); Bradley I. Raffle, *Prevention of Significant Deterioration and Nonattainment Under the Clean Air Act—A Comprehensive Review*, 27 Env't Rep. (BNA) (May 4, 1979) [hereinafter *Comprehensive Review*]; John Quarles, *Federal Regulation of New Industrial Plants*, 28 Env't Rep. (BNA) (May 4, 1979); Steven A. Goldberg, *Source Planning Under the New PSD Regulations*, 29 Env't Rep. (BNA) (Nov. 21, 1980).
9. A thorough canvassing of PSD implementation would address at least six topics lying beyond the scope of this Article: (1) the geographic reach of the program, including designations, redesignations, and classifications; (2) PSD permit triggers and avoidance mechanisms; (3) best available control technology standards; (4) increment consumption and air quality-related values in Class I areas; (5) permit procedures; and (6) enforcement.
10. Lord Alfred Tennyson, *Ulysses* (1842).
11. John-Mark Stensvaag, *The Not So Fine Print of Environmental Law*, 27 Loy. L.A. L. Rev. 1093, 1103 (1994).

A. The Core PSD Principle: Preventing Deterioration to NAAQS Levels

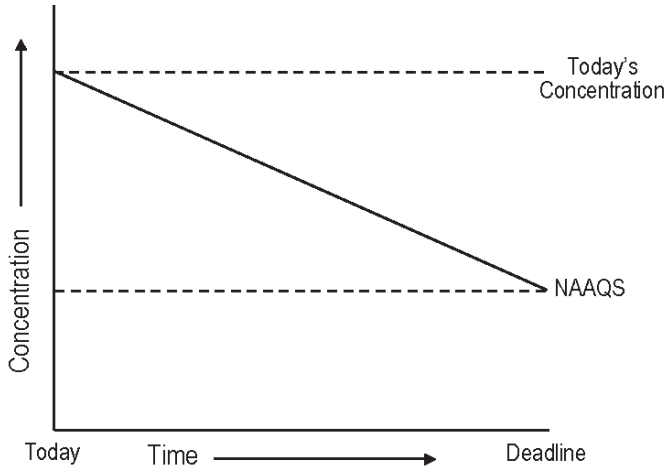
The core principle of the PSD program is that air quality in clean areas of the country must be prevented from degrading to the levels otherwise permitted by NAAQS.[12] There are currently 13 NAAQS for 6 "criteria" pollutants.[13] These pollutants and their associated NAAQS are set forth in Table 1.[14] NAAQS are iron-clad maximum pollutant concentration levels that must (in theory) never be exceeded in any outdoor location in the nation. In fact, however, more than 125 million Americans live in parts of the country that violate one or more NAAQS.[15] The CAA's "nonattainment" program is designed to bring such communities into compliance by attainment deadlines that vary based on the severity of the nonattainment.[16]

Table 1. National Ambient Air Quality Standards for the Criteria Pollutants

Pollutant	Primary (Health Related)		Secondary (Welfare Related)	
	Type of Average	Standard Level Concentration	Type of Average	Standard Level Concentration
CO	8-hour	9 ppm (10 mg/m^3)	No Secondary Standard	
	1-hour	35 ppm (40 mg/m^3)	No Secondary Standard	
Pb	Maximum Quarterly Average	1.5 μg/m^3	Same as Primary Standard	
NO_2	Annual Arithmetic Mean	0.053 ppm (100 μg/m^3)	Same as Primary Standard	
O_3	Maximum Daily 1-hour Average	0.12 ppm (235 μg/m^3)	Same as Primary Standard	
	Maximum Daily 8-hour Average	0.08 ppm	Same as Primary Standard	
PM_{10}	Annual Arithmetic Mean	50 μg/m^3	Same as Primary Standard	
	24-hour	150 μg/m^3)	Same as Primary Standard	
$PM_{2.5}$	Annual Arithmetic Mean	15 μg/m^3	Same as Primary Standard	
	24-hour	65 μg/m^3)	Same as Primary Standard	
SO_2	Annual Arithmetic Mean	0.03 ppm (80 μg/m^3)	3-hour	0.50 ppm (1,300 μg/m^3)
	24-hour	0.14 ppm (365 μg/m^3)		

The PSD program is designed to protect air quality in areas in which one or more NAAQS are not being exceeded—so-called attainment or unclassifiable areas.[17] Nevertheless, it is helpful when confronting the baselines, increments, and ceilings of the PSD program to consider how the problem of nonattainment and its remedies may be diagrammed. Figure 1 is a generic depiction of a community whose air quality currently violates a NAAQS.[18] The diagonal line (moving downward from the upper left-hand corner to the right-hand axis, where it meets the NAAQS concentration value) depicts the CAA command that the nonattainment area must bring its ambient air concentration into compliance by the relevant deadline.

Figure 1: Nonattainment



12. Congress directed EPA to promulgate NAAQS in CAA §109, 42 U.S.C. §7409. "Primary" NAAQS are designed to protect the public health; "secondary" standards are designed to protect public welfare. *See id.*

13. These pollutants are called "criteria" pollutants because EPA has listed them pursuant to CAA §108(a)(1), 42 U.S.C. §7408(a)(1), and has published "criteria documents" (discussing the sources and adverse impacts of such pollutants) pursuant to CAA §108(a)(2), 42 U.S.C. §7408(a)(2).

14. Table 1 is based on 40 C.F.R. §§50.4-.12 (1998) and U.S. EPA, 1996 National Air Quality and Emissions Trends Report 7 (1997) (available from the ELR Guidance & Policy Collection, ELR Order No. AD03692), and is *reprinted from* John-Mark Stensvaag, Materials on Environmental Law 300 (1999). Although Table 1 seems to depict seven, rather than six, criteria pollutants, the standards for particulate matter with a diameter of 10 microns or less (PM_{10}) and PM having a diameter equal to or less than 2.5 microns or less are addressed to particulates of different sizes, and it is common for environmental lawyers to treat the two sizes of particulates as a single criteria pollutant.

15. *See* U.S. EPA, National Air Quality and Emissions Trends Report 2003, at tbl. A-19 (2004), *available* at http://www.epa.gov/airtrends/non_table.pdf (last visited Sept. 27, 2005).

16. For example, in communities currently in violation of the eight-hour ozone nonattainment standard, the attainment deadlines vary from 2007 ("marginal" nonattainment areas) to 2024 ("extreme" nonattainment areas). *See* John-Mark Stensvaag, Materials on Environmental Law 16-19 (Supp. 2005). The nonattainment program is explored in Stensvaag, *supra* note 14, at 496-518.

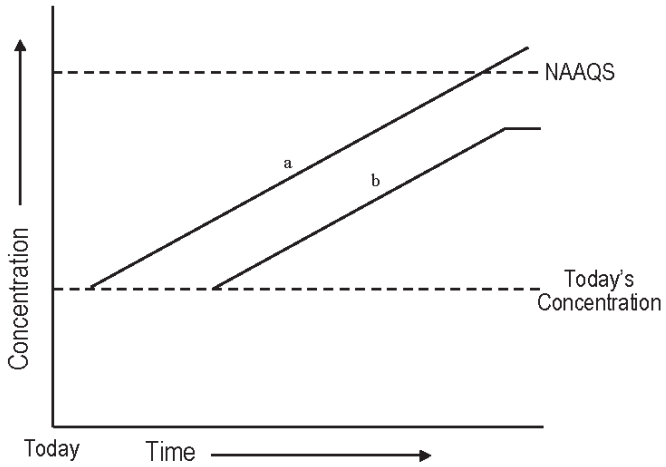
17. A "nonattainment" area is a location in which a NAAQS is being exceeded; for example, if a community is in violation of a NAAQS for carbon monoxide (CO), it is said that the area is "nonattainment for CO." An "attainment" area is a location in which ambient air monitoring data has demonstrated compliance with a NAAQS; for example, if a community's air quality demonstrably complies with a CO NAAQS, it is said that the area is "attainment for CO." An "unclassifiable" area is one in which ambient air monitoring data is insufficient to categorize the community as attainment or nonattainment. *See* CAA §107(a)(1)(A), 42 U.S.C. §7407(a)(1)(A). The PSD program applies in any area that is attainment or unclassifiable for at least one NAAQS. *See* CAA §§161 & 167, 42 U.S.C. §§7471 & 7477.

18. Figure 1 is adapted from Stensvaag, *supra* note 14, at 498.

How does a nonattaining community come into compliance with a NAAQS via Figure 1's diagonal line? Therein lies a tale. For ozone nonattainment alone, the statutory directive runs more than 8,000 words.[19] The CAA's nonattainment program is famously complex, and rightfully so. But our focus here is not on these iniquitous communities; rather, our concern is the current and future air quality of communities whose air sweetly complies with a NAAQS.

Prior to *Sierra Club v. Ruckelshaus*[20] in the early 1970s, EPA ignored the possibility that a community in attainment with one or more NAAQS might eventually, by reason of industrial growth, find its air quality deteriorating to the point where that NAAQS might be approached or even exceeded. We can depict that possibility in Figure 2 (because the community is in compliance with the relevant NAAQS, Figure 2 does not denote a deadline for bringing ambient air concentrations within such limits). The diagonal lines depict the possibility that ambient air concentrations may increase over time. Petitioners in *Sierra Club* alleged that the Agency must take precautions to prevent such degradation, and the courts agreed.[21]

Figure 2: Deterioration



Accordingly, the core principle of the PSD program is that air quality in attainment (and unclassifiable) areas must not be permitted to approach (line *b*) or exceed (line *a*) NAAQS for which the areas are in compliance.[22] In other words, the PSD program is all about preventing Figure 2, line *a*, and constraining the upward sweep of Figure 2, line *b*, to an acceptable peak level.

B. Baselines, Increments, and Ceilings: A First Look

Before plunging into the real-world morass of modern baseline, ceiling, and increment consumption analysis, it is helpful to grasp the simple outlines of the increment system. The following paragraphs might best be understood as a sort of "increments for dummies" primer. As with most such primers, its instructive power depends on the technique of oversimplification.

The PSD program effectively establishes unique ambient air quality standards (ceilings) for three of the six criteria pollutants.[23] In contrast to NAAQS, which must be met throughout the nation, these new ceilings apply only in the local communities in which the PSD program has been triggered. Accordingly, they may be thought of as *local* ambient air quality standards (LAAQS).[24]

In principle, each LAAQS ceiling is established through a straightforward mathematical process. The existing ambient air quality for a given pollutant—the "baseline"—is determined (ideally, through air quality monitoring), and a pre-defined "increment"[25] number is added to that baseline value to compute the ceiling.[26] The process is depicted generically in Figure 3. The wisdom of this approach—a system of limiting increases in local ambient air quality by adding fixed increment values to unique baseline (existing air

19. *See* CAA §182, 42 U.S.C. §7511a.

20. 344 F. Supp. 253, 2 ELR 20262 (D.D.C. 1972), *aff'd without opinion*, 4 Env't Rep. Cas. (BNA) 1815 (D.C. Cir. 1972), *aff'd by an equally divided Court sub nom.* Fri v. Sierra Club, 412 U.S. 541, 3 ELR 20684 (1973).

21. *See* Oren, *supra* note 6, at 10.

22. This statement is slightly simplistic. There will be some instances in which the PSD program will permit degradation up to the level of the relevant NAAQS. This is true whenever existing air quality is sufficiently poor so that the difference between the baseline and NAAQS is less than the applicable increment.

23. These three criteria pollutants are particulates (measured as PM_{10}), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). As Table 1 shows, these three pollutants are governed by six NAAQS—three for annual arithmetic mean measurements (PM_{10}, NO_2, and SO_2), two for 24-hour maximum measurements (PM_{10} and SO_2), and one for 3-hour maximum measurements (SO_2). At times, we will refer to PM_{10}, NO_2, and SO_2 as the "increment pollutants" because they are the only pollutants for which increments have been established.

24. Although this nomenclature seems faithful to the program initially envisioned by EPA and Congress, I have been unable to find any references to LAAQS in publicly available documents. *But see* Amy R. Coy & Eric A. Groten, *New Growth in the PSD Forest: A Trial Map*, NAT. RESOURCES & ENV'T, Spring 1989, at 33, 57 ("The increment, when added to the ambient concentration on the baseline date . . . essentially creates a new, local ambient air quality standard."). *See also* Oren, *supra* note 6, at 28:

> [T]he sum of the increments and the pre-existing baseline concentration amount to a kind of "tertiary" standard controlling the maximum level of pollution in any clean air area [which unlike] the primary and secondary standards . . . is not uniform [but] varies according to the baseline concentration in each area and the classification of the area.

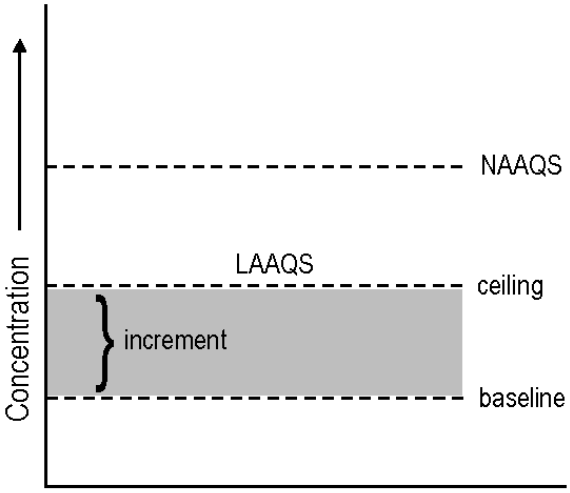
This Article will use the terms "ceiling," "tertiary standard," and "LAAQS" interchangeably.

25. *See* 53 Fed. Reg. 3698, 3699 (Feb. 8, 1988) (the statute and regulations "define deterioration using specific numerical measures . . . establishing maximum increases (increments) in ambient air concentrations . . . allowed over a baseline concentration").

26. *See* CAA §§163, 165(a)(3)(A), 42 U.S.C. §§7473, 7545(a)(3)(A).

quality) numbers—has been thoroughly criticized by a first-rate scholar,[27] but we take the approach as a given.

Figure 3: Baseline, Increment, and Ceiling



The increment values, set forth in Table 2, have been established by Congress and EPA.[28] There are actually three sets of increment values for each pollutant and corresponding NAAQS: a set of parsimonious Class I increments,[29] a more generous set of Class II increments, and an even more lenient set of Class III increments.[30]

Table 2
Maximum Allowable Increment
(micrograms per cubic meter [$\mu g/m^3$])
Source: CAA § 163(b) & 40 C.F.R. §§ 50.4-.12, 52.21(c) (2005)

	PM_{10}		SO_2			NO_2
	Annual Arithmetic Mean	24-hr Max	Annual Arithmetic Mean	24-hr Max	3-hr Max	Annual Arithmetic Mean
Class I	4	8	2	5	25	2.5
Class II	17	30	20	91	512	25
Class III	34	60	40	182	700	50
Primary NAAQS	50	150	80	365		100
Secondary NAAQS	50	150			1300	100

The "class" designations refer to geography. When Congress codified the PSD program in the 1977 CAA Amendments, every location in the country was assigned to one of the three classes. Congress designated certain international parks, national wilderness areas, and national parks as Class I.[31] All remaining attainment and unclassifiable areas of the nation were designated as Class II.[32] States and Native American tribes may redesignate any area to Class I[33]; they also have limited authority to redesignate certain locations to Class III.[34]

27. *See* Oren, *supra* note 6.

28. Congress set forth the initial increment values for particulates and SO_2. *See* CAA §163, 42 U.S.C. §7473. EPA amended the particulate NAAQS in 1987 to specify measurement of PM_{10} as a replacement for the former measurement of total suspended particulates (TSPs). *See* 52 Fed. Reg. 24634 (July 1, 1987). In the 1990 CAA Amendments, Congress authorized the Agency to substitute PM_{10} increments for the statutory TSP increments, *see* CAA §166(f), 42 U.S.C. §7476(f), and EPA did so. *See* 58 Fed. Reg. 31622 (June 3, 1993). The transition from the TSP to the PM_{10} measurement method for particulates has been highly complex, struggling with such issues as what should be done with baseline dates, baseline areas, and baseline concentrations established under the TSP approach once NAAQS and the increments have been changed to the PM_{10} approach. *See id.* at 31629-35. The TSP to PM_{10} transition is beyond the scope of this Article.

Meanwhile, EPA established increment values for NO_2 when it brought that pollutant into the PSD increment system, *see* 53 Fed. Reg. 40656, 40670-72 (Oct. 17, 1988), pursuant to CAA §166(a), 42 U.S.C. §7476(a). Table 2, *reprinted from* STENSVAAG, *supra* note 14, at 466, is a compilation of the values resulting from these combined congressional and Agency actions.

29. Enforcement of the Class I increments is an extraordinarily complicated topic, governed primarily by the intricate language of CAA §165(d), 42 U.S.C. §7475(d). A PSD permit may not be issued, even though the Class I increment will be complied with, if a designated federal official "demonstrates to the satisfaction of the State that emissions . . . will have an adverse impact on air quality-related values (including visibility) . . . ." CAA §165(d)(2)(C)(ii), 42 U.S.C. §7475(d)(2)(C)(ii). Moreover, a PSD permit may be issued, notwithstanding projected violation of a Class I increment, if a designated federal official certifies that the emissions "will have no adverse impact on air quality-related values . . . (including visibility) . . . ." CAA §165(d)(2)(C)(iii), 42 U.S.C. §7475(d)(2)(C)(iii). *See also* CAA §169A, 42 U.S.C. §7491 (setting forth elaborate procedures designed to protect visibility in federal Class I areas).

In light of the CAA's uniquely complex approach to the Class I increments, the analysis in this Article is confined to the exploration of baselines, increments, and ceilings as they pertain to Class II (and, in theory) Class III areas. For illuminating discussions of how Class I increment consumption is analyzed, see *In the Matter of Hadson Power 14—Buena Vista Permit 21130*, PSD Appeal Nos. 92-3 et al., 1992 WL 345661, 4 E.A.D. 258, ELR ADMIN. MAT. 40069 (EPA EAB Oct. 5, 1992); *In the Matter of Old Dominion Electric Cooperative*, PSD Appeal No. 91-39, 1992 WL 92372, 3 E.A.D. 779 (EPA Adm'r Jan. 29, 1992).

30. Because the three criteria pollutants are governed by six NAAQS, *see supra* note 23, there are six increments for each of the classes. An annual increment is violated if it is exceeded once in a given year; the short-term increments are violated only if the second-highest reading in a given year exceeds the increment value. *See* CAA §163(a), 42 U.S.C. §7473(a). *See also* Oren, *supra* note 6, at 27 n.106 (suggesting that the "one-bite rule" is "a concession to the difficulties of air quality modeling").

31. CAA §162(a), 42 U.S.C. §7472(a).

32. *Id.* §162(b), 42 U.S.C. §7472(b).

33. *See id.* §164(a), 42 U.S.C. §7474(a).

34. *See id.* The option to redesignate an area to Class III has apparently never been exercised.

Figure 4: Class II Illustration (PM_{10})

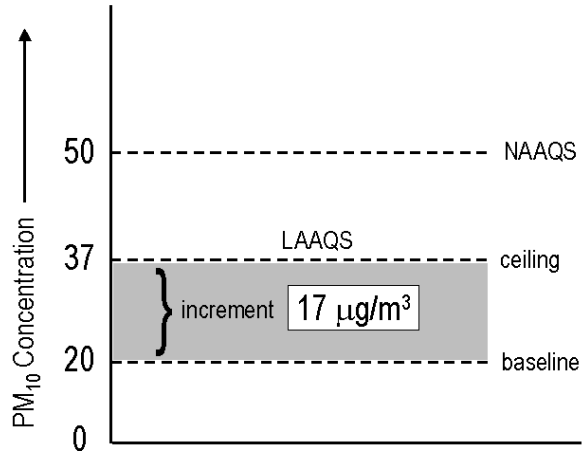
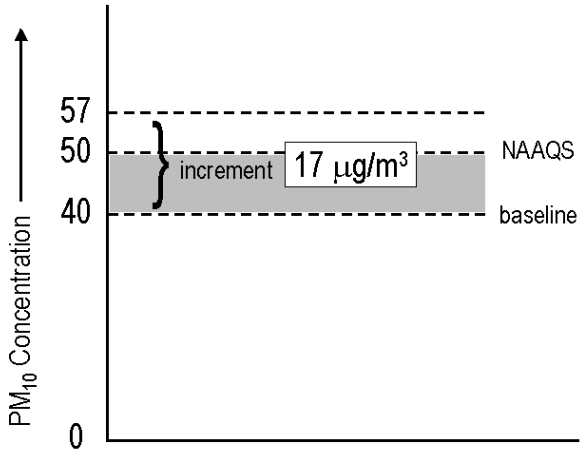


Figure 5: NAAQS Constraint on LAAQS Ceiling



The generic operation of the baseline-increment-ceiling system depicted in Figure 3 is illustrated more concretely in Figure 4. The NAAQS for particulate matter with a diameter of 10 microns or less (PM_{10}) is 50 micrograms per cubic meter ($\mu g/m^3$) annual arithmetic mean. If we assume that the existing ambient air concentration of PM_{10} (the baseline) in an area is 20 $\mu g/m^3$, and further assume that the location is in Class II, the PSD increment (taken from Table 2) is 17 $\mu g/m^3$. By adding the increment to the baseline, we learn that the maximum permissible ambient air concentration for PM_{10} in this location is no longer the 50 $\mu g/m^3$ ordinarily allowed by the NAAQS, but a much more restrictive value of 37 $\mu g/m^3$. If the location were in a Class I area, the increment would be 4 $\mu g/m^3$ and the ceiling would be 24 $\mu g/m^3$.

One final feature of the increment system is that the ceilings (LAAQS) established through the foregoing process can never exceed the corresponding NAAQS.[35] This constraint is illustrated in Figure 5. Because the NAAQS for PM_{10} is 50 $\mu g/m^3$, a Class II area with a baseline value of 40 $\mu g/m^3$ will not be allowed to use the full 17 $\mu g/m^3$ ordinarily available for such locations. In reality, therefore, the true room for industrial growth in the community depicted in Figure 5 is constrained by a truncated increment of 10 $\mu g/m^3$.

C. Baseline Value Errors and Their Ripple Effect

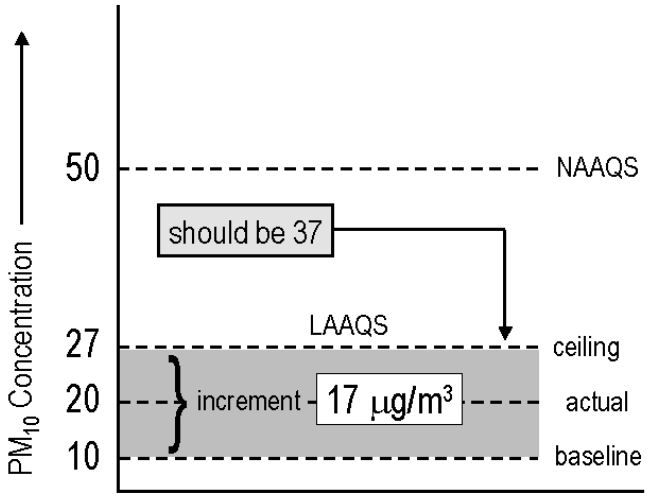
Because the baseline value is the floor to which the increment will be added to calculate the ceiling, computation of the baseline is a critical step in the PSD program. At the level of pure theory, each baseline value represents *actual* ambient air quality at a specific location (the baseline area) at a specific time (the baseline date). Because Congress and EPA have tinkered with the baseline definition for policy reasons, the baseline values used in the PSD program do not adhere perfectly to this theoretical notion. Nevertheless, it is helpful to start with the idea that the baseline value is no more mysterious than a snapshot of *existing* air quality—a starting point from which only a strictly limited degree of deterioration will be permitted.

The task of measuring ambient air quality—central to many aspects of the CAA—is a formidable challenge and an imperfect art. Choices must be made in selecting monitoring devices, monitoring locations, sampling methodologies, sampling durations, counting procedures, and so forth. EPA provides reference methods for the measurements required to determine compliance (or noncompliance) with each of the 13 NAAQS set forth in Table 1.[36] The important thing for our present purposes is the recognition that these measurements may be erroneous—they may fail to reflect accurately the actual ambient air quality being measured.

35. *See id.* §165(a)(3)(B), 42 U.S.C. §7475(a)(3)(B).

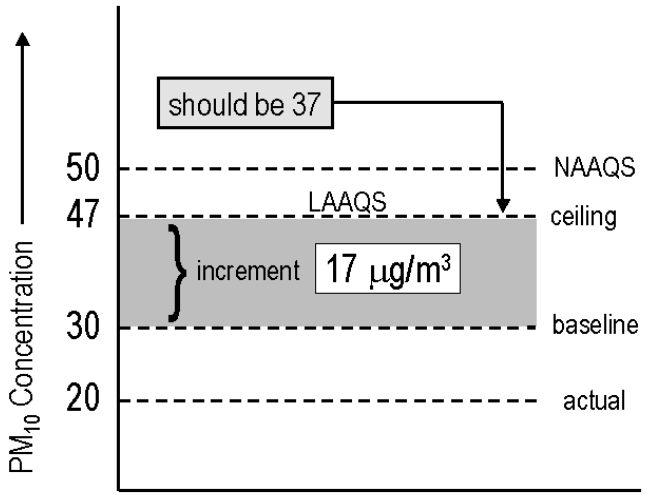
36. *See* 40 C.F.R. pt. 50, apps. A-D, F-G, J & L.

Figure 6: Baseline Erroneously Set Too Low



In the PSD increment system, inaccurately calculated baseline values will have an important ripple effect. For example, if an error leads to the establishment of a baseline value significantly lower than the true ambient air concentration of a pollutant, the mathematically computed ceiling may leave much less room for industrial growth than intended by the program. Sticking with the illustration of PM_{10} in a Class II area, the ripple effect of erroneously setting too low a baseline value is depicted in Figure 6. Even though the PSD program is structured to permit future industrial growth degrading the air by an increase in ambient PM_{10} of up to 17 $\mu g/m^3$, because of the error depicted in Figure 6, the actual room for growth has been mistakenly limited to an increase of 7 $\mu g/m^3$. An environmental advocate preferring to limit air quality deterioration to the maximum possible extent possible would presumably welcome the error depicted in Figure 6.

Figure 7: Baseline Erroneously Set Too High



Baseline calculation error may also occur in the other direction, of course: the baseline value may be set at a level significantly higher than actual ambient air quality. Such a possibility is illustrated in Figure 7. As a ripple effect of the error depicted in Figure 7, the actual room for growth has been mistakenly expanded to 27 $\mu g/m^3$ rather than the 17 $\mu g/m^3$ intended by the PSD program. A developer wishing to open up industrial growth to the greatest extent possible might welcome the error depicted in Figure 7.[37]

D. The Starting Gun: Baseline Dates

There are exceptions to the rule,[38] but most attainment (and unclassifiable) areas of the country have exhibited a gradual deterioration of ambient air quality and are likely to continue doing so in the future. Such deterioration is a logical consequence of population and industrial growth.[39] More and more people drive cars, increasing numbers of people seek employment, the beat goes on. It follows, therefore, that the ambient air concentrations of PM_{10}, sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) typically increase over time in those portions of the country that are subject to the PSD program.

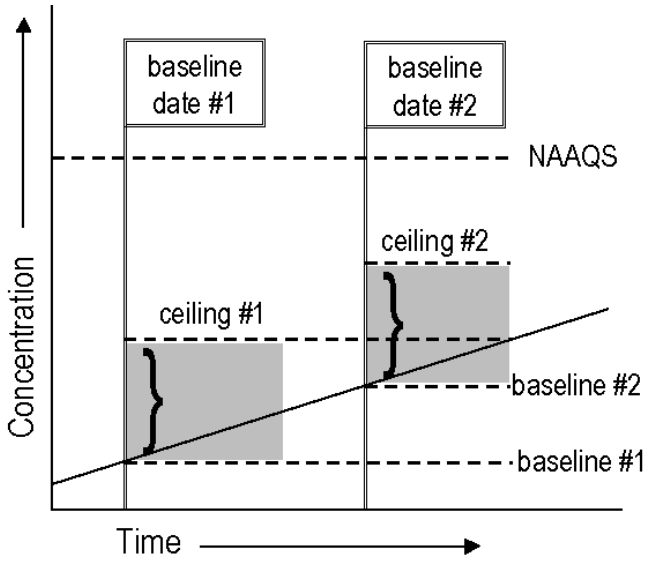
Given this seemingly inexorable trajectory, the *date* at which a given community is required to establish its baseline values may have a profound effect on the LAAQS ceilings ultimately imposed by the PSD program. That occasion, called the "baseline date," is defined in highly complicated ways by the statute and implementing regulations. In the simplistic introductory portion of this Article, it is enough to know that the PSD program does not impose a single baseline date all over the nation; instead, baseline dates are triggered in much smaller locations—"baseline areas"—at widely varying times.

37. A developer's motives may be mixed, however. Assume, for example, that two competitors own shale in the Rocky Mountains, and each would like to construct the facilities necessary to process the shale into oil. The first actor to obtain a PSD permit might benefit by the Figure 6 error because the erroneously restrictive baseline-ceiling calculation might prohibit the other actor from constructing a competing facility by precluding the issuance of a PSD permit for the second actor.

38. EPA discussed one exception as it struggled to define the baseline date for NO_2 when that pollutant was added to the increment system in 1988. *See supra* note 28. Because mobile source emissions decreased between 1980 and 1988, selection of 1988 as a baseline date for NO_2 would have resulted in a lower baseline value for some urban areas than selection of a retroactive 1980 baseline date. *See* 53 Fed. Reg. at 40668. If the 1980 baseline date had been selected, subsequent mobile source emission reductions would have resulted in an expansion of the increment; if the 1988 baseline date had been selected, the 1980 to 1988 mobile source emission reductions would have resulted in a reduction of the baseline concentration. *See id.*

39. The nonattainment program of the CAA has been devilishly difficult to implement precisely because it is swimming against this historical current.

Figure 8: Alternative Baseline Date Starting Guns



The potential significance of baseline dates is illustrated in Figure 8. If we imagine a typical attainment area in which ambient air concentrations are gradually increasing through time (represented by the diagonal line), selection of a baseline date effectively represents a starting gun for developers. At all times prior to the baseline date, industrial growth is constrained only by NAAQS; once the baseline date has been triggered and the baseline value established, the mathematically derived LAAQS ceilings kick in,[40] frequently limiting deterioration to levels significantly below the corresponding NAAQS. Thus, if baseline date #1 is selected in Figure 8, the more restrictive LAAQS ceiling is imposed at that time, constraining all subsequent growth. If baseline date #2 is selected, growth is not constrained by anything other than NAAQS until that later point in time; moreover, the ultimate ceiling on the area will be significantly more generous than the LAAQS that would have resulted from a choice of baseline date #1.

Thus, in a typical clean area of the country, environmental advocates seeking to limit air quality degradation to the greatest extent possible prefer a regime in which baseline dates are triggered earlier rather than later. The opposite is presumably true for developers, who prefer a system in which the triggering of baseline dates is delayed for as long as possible.

E. The Starting Gun: Baseline Areas

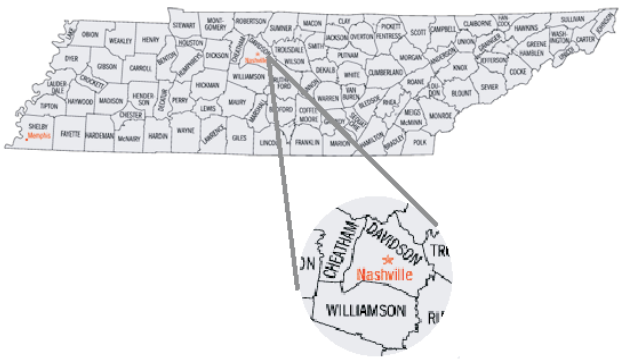
One way to delay (or accelerate) the triggering of baseline dates is to define the trigger in a manner postponing (or hastening) its firing. A separate way to manipulate the starting gun is to expand or contract the geographic area affected by the triggering of a given baseline date. Imagine, for example, that no baseline values have yet been established in the state of Tennessee. If, as depicted in Figure 9, the baseline area for PSD purposes is defined as the entire state, the triggering of the baseline date in a single location in Tennessee will trigger the establishment of baseline values—and the mathematically derived growth ceilings—for every location in the state. In a sense, the baseline dates for all areas not in the immediate vicinity of the triggering event will have been accelerated. For all portions of the state falling within Class II, the six ceilings calculated by adding the Table 2 increments for PM_{10}, SO_2, and NO_2 to the baseline values for those pollutant/measurement combinations will be identical. Moreover, all future industrial growth throughout the state will chew up the remaining available increment because the starting gun has sounded for all of Tennessee.

Figure 9: Baseline Area Illustration—Entire State

Now imagine, by contrast, that the baseline areas for PSD purposes are defined as the 95 individual counties in the state of Tennessee, as depicted in Figure 10. In such a regime, the triggering of a baseline date in Williamson County would have no effect on the rest of the state. No baseline date would yet have occurred in the other 94 counties, and no baseline values and associated growth ceilings would have been established for those locations. The starting gun will have sounded only in Williamson County, and the baseline dates for the remaining 94 counties will have been delayed.

40. "[T]he 'baseline date' marks the date after which increases in a pollutant in an area consume increment." 53 Fed. Reg. at 3705.

Figure 10: Baseline Area Illustration—Individual Counties



Given the dynamic significance of defining the baseline area, we can once more consider where the two major interest groups are likely to stake their claims. In a typical clean area of the country, environmental advocates seeking to limit air quality degradation to the greatest extent possible prefer a regime in which baseline areas are broadly defined to embrace large tracts of land; this is consistent with their preference for the early triggering of baseline dates. Developers, by contrast, are likely to prefer baseline areas that are narrowly defined to embrace much smaller tracts of land; this is consistent with their preference for a system in which the triggering of baseline dates is delayed for as long as possible.

F. Increment Compliance Analysis

The foregoing description is straightforward and relatively easy to understand. But what does it all mean in the end? Early commentators on the PSD program anticipated that each ceiling established through the baseline-plus-increment computation process would be treated as if it replaced and fully substituted for the associated NAAQS. Thus, Bradley Raffle wrote in 1979 that "a PSD area in which the increment is consumed becomes, for all practical purposes, a nonattainment area."[41] Similarly, Amy Coy and Eric Groten wrote: "The sum of the increments and the pre-existing baseline concentration amount to a kind of 'tertiary' standard controlling the maximum level of pollution in any clean air area [with] the tertiary standard [varying] according to the baseline concentration in each area and the classification of the area."[42]

In such a regime, the baseline values themselves would ideally play no more than a temporary role. Each baseline value would act as the floor to which the appropriate increment is added, but once that mathematical computation had been completed, the resulting local ambient air quality ceiling—and *only* the ceiling—would have any enduring significance. The baseline value, having fulfilled its role, would drop out of the picture, in the same way that all of the *Sturm und Drang*[43] preceding adoption of the NAAQS becomes insignificant once those mighty standards have been promulgated and have withstood court challenges.

If this is the way the system works, the process of determining compliance with the PSD increment system would be as straightforward as determining compliance with NAAQS. Ongoing air quality measurements would be continually compared to the relevant LAAQS and—if a violation were detected—the area would kick over into nonattainment mode. Measurement of *ambient* air quality would be the key to enforcing the increment system.

In fact, however, the process of determining compliance with the increment system has become an extraordinarily complicated undertaking, resembling a Rube-Goldberg machine.[44] To explore how we have arrived at this state, we must now turn to the past 30 years of statutory drafting, regulatory drafting, and interpretative choices.

III. Baseline Dates: Flashbulbs at a Rock Concert

A. What the Statute Says

Congress gave surprisingly little guidance for establishing the baseline date(s) to be used in the PSD program.[45] Nevertheless, the statute contains one definitional clause that has the effect of limiting EPA's discretion:

> The term "baseline concentration" means, with respect to a pollutant, the ambient concentration levels which exist at the time of the first application for a permit in an area subject to this part . . . .[46]

The reference to "this part" is to CAA Subchapter 1, Part C, entitled "Prevention of Significant Deterioration of Air Quality." Accordingly, the baseline date suggested by the statutory language is the date on which the first application for a PSD permit occurs in an area; it is the ambient air quality on that date which is to serve as the baseline concentration value.

To be sure, the statutory language about the first application "*in an area*" begs the question of how broadly or nar-

41. *Comprehensive Review*, *supra* note 8, at 51. *See also id.* (this interpretation by EPA "appears consistent with the legislative history").

42. Coy & Groten, *supra* note 24, at 57. These authors use the term "tertiary" because there are two sets of NAAQS: primary and secondary. *See also* Oren, *supra* note 6, at 29 ("the increments impose a variable 'tertiary' air quality standard consisting of the baseline plus the increments"); *id.* at 28 n.111 ("The phrase goes back at least to the [c]ongressional dissenters from the 1977 codification.").

43. "Sturm und Drang," or "Storm and Stress," refers to a movement in German literature that flourished in the late 18th century. The movement focused on subjectivity and on the unease of man in contemporary society. *See* Bartleby.com, *Sturm und Drang* (from The Columbia Encyclopedia 6th ed. 2001-2005), *at* http://www.bartleby.com/65/st/Sturmund.html (last visited Sept. 21, 2005). In contemporary parlance, the term refers to "turmoil" or "ferment."

44. "Reuben ('Rube') Lucius Goldberg (1883 to 1970) was an American cartoonist who delighted his readers with drawings of contrivances that used complicated means to perform what otherwise could be accomplished quite simply." AMERICAN HERITAGE TALKING DICTIONARY (1997).

45. "[T]he Act does not clearly define the date for establishing a baseline." *Comprehensive Review*, *supra* note 8, at 58.

46. CAA §169(4), 42 U.S.C. §7479(4).

rowly the referenced geographic area is to be defined. At a minimum, however, the statute seems to say that *no* baseline concentration exists unless and until there has been one PSD permit application.

B. EPA's Abortive Attempt to Establish a Single, Nationwide Baseline Date

When EPA issued its first set of implementing regulations following congressional enactment of the PSD program in the 1977 CAA Amendments, the Agency provided for a single, nationwide baseline date: "'Baseline concentration' means that ambient concentration level reflecting actual air quality as of August 7, 1977 [subject to certain adjustments] . . . ."[47] EPA explained its decision as follows:

> [T]he regulations promulgated today recognize the severe technical and administrative problems with implementing a definition of baseline concentration that relates to the date of first permit application in an area. The administrator believes that a strict interpretation of the Act's language would create thousands of different areas each with different baseline starting points. Moreover, these areas would eventually overlap as more and more sources applied for PSD permits. The final regulations . . . resolve those problems by establishing a uniform starting date for determining the baseline concentration in all areas.[48]

When this approach was challenged in *Alabama Power Co. v. Costle*,[49] EPA's attorney asserted at oral argument that selection of a single nationwide baseline date was necessary to preclude an anomaly:

> There is no apparent reason why in one clean air area five "minor" sources constructed at the same time as five "minor" sources in another clean air area should be counted against the increment simply because the first application by a major [emitting] facility for a PSD permit came at an earlier date in the first area than in the second.[50]

This argument builds on the truism that emissions from minor sources commencing before establishment of the baseline do not count against the increment, but emissions from minor sources commencing after baseline establishment do count against the increment. EPA's decision to establish a single nationwide baseline date of August 7, 1977, would have assured that emissions from *all* minor sources commencing after that date would count against the increment.

Concluding that "EPA has no authority to overrule a clear, consistent congressional directive,"[51] the *Alabama Power* court struck down the Agency's effort to establish a single nationwide baseline date.[52] In doing so, the court stressed that the statutory approach—resulting in multiple baseline dates blossoming all over the country—was the product of careful deliberation by Congress:

> The statutory definition of baseline concentration was in no sense a product of legislative inadvertence. Congress focused on how to define the baseline and fully understood the consequences of its chosen resolution. The Conference Committee explicitly acknowledged its adoption of the [U.S.] Senate definition of baseline, and the Senate report had explicitly rejected EPA's uniform date approach. Indeed, it purposely embraced the situation EPA's counsel considers anomalous: "Under this definition (of baseline) it is possible for nonmajor emitting sources to be constructed in the area after the date of enactment without having their emissions affect the ability of major emitters to use the increment available."[53]

Pointing out the Senate's explanation that "[t]he purpose is to use actual air quality data to establish the baseline,"[54] the court concluded that the "differential treatment of clean air areas, keyed to when the first major emitting facility applies for a permit, is based on a sound, practical consideration."[55] Congress had chosen its somewhat unusual statutory language precisely because "the task of monitoring existing ambient pollution levels in attainment areas is assigned to the first permit applicant, who will provide the information essential to calculation of the baseline."[56] Without the data, there can be no baseline, and without a PSD permit application, there will be no data.

The statutory language may justify the court's rejection of EPA's attempt to establish a single nationwide baseline date. Moreover, it may even be good policy. It has, however, resulted in a regime in which baseline dates pop up all over the country like flashbulbs at a rock concert—randomly, spasmodically, and at a rate and time controlled solely by the whim of those who control the shutters: the first actors in each area to submit a PSD permit application.

C. The Baseline Date Trio: Major, Minor, and Trigger

Following the U.S. Court of Appeals for the District of Columbia Circuit's rejection of a single nationwide baseline date, EPA revised its regulations to establish what has eventually become a trio of dates, consisting of: (1) a major source baseline date; (2) a minor source baseline date; and (3) a trigger date. The regulations now[57] provide:

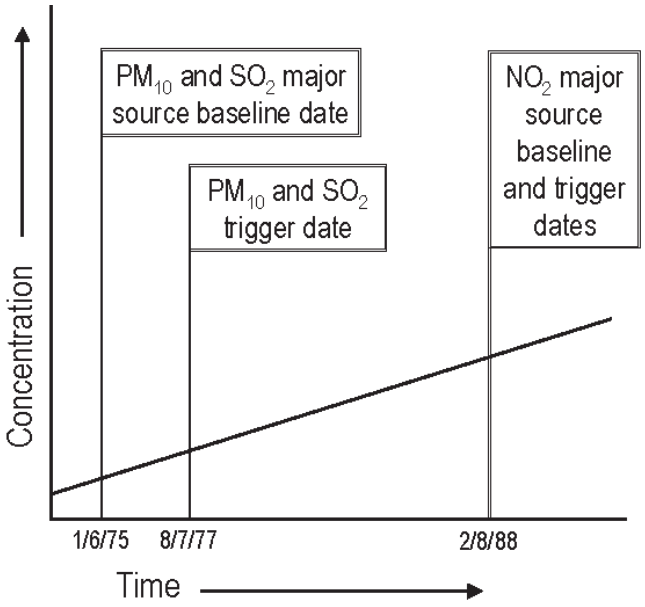
> (i) *Major source baseline date* means:
> (a) In the case of particulate matter and sulfur dioxide, January 6, 1975, and
> (b) In the case of nitrogen dioxide, February 8, 1988.
> (ii) *Minor source baseline date* means the earliest date after the trigger date on which a major stationary source or a major modification subject to [the PSD permit requirements] . . . submits a complete application . . . . The *trigger date* is:
> (a) In the case of particulate matter and sulfur dioxide,

47. 40 C.F.R. §51.24(b)(11) (1978), *promulgated in* 43 Fed. Reg. at 26404; 40 C.F.R. §52.21(b)(11) (1978), *promulgated in* 43 Fed. Reg. at 26383.
48. 43 Fed. Reg. at 26400.
49. 636 F.2d 323, 10 ELR 20001 (D.C. Cir. 1979).
50. *Id.* at 375.
51. *Id*. *See also id.* at 374 (referring to EPA's single nationwide baseline date regulation as "a remarkable assertion of administrative power to revise what Congress has wrought").
52. *Id*. at 375-76.
53. *Id.* at 375.
54. *Id.* (quoting S. Rep. No. 127, 95th Cong. 98 (1977)).
55. *Id*.
56. *Id.* at 376.
57. The baseline date definitions originally adopted pursuant to the *Alabama Power* remand concerned only PM_{10} and SO_2. The definitions were amended to address NO_2 when that pollutant was added to the increment system in 1988. *See* 53 Fed. Reg. at 40670-71. The terms "major source baseline date" and "minor source baseline date" were added to the definition of "baseline date" when EPA promulgated the new NO_2 increments. *See* 54 Fed. Reg. 41218, 41219 n.4 (Oct. 5, 1989).

August 7, 1977, and
(b) In the case of nitrogen dioxide, February 8, 1988.[58]

Thus, two of the three dates are fixed (major source baseline date and trigger date) and are uniform throughout the nation; the fixed dates differ, however, for PM_{10} and SO_2 on the one hand and NO_2 on the other. These fixed dates are depicted in Figure 11.

Figure 11: Major Source Baseline and Trigger Dates



The creation of three sets of dates—and the nomenclature used to label them—is so confusing that it is helpful to consider EPA's explanation:

> The term "baseline date" . . . is somewhat of a misnomer, as it encompasses three different dates: (1) the major source baseline date, (2) the minor source baseline date, and (3) the trigger date for the minor source baseline date. The major source baseline date is the date after which construction of any major new or modified stationary source . . . consumes increment. The minor source baseline date is the date after which emissions from all new or modified sources consume (or expand) increment, including emissions from major and minor sources. Once the baseline concentration is set, changes in actual emissions at any source consume (or expand) increment, regardless of whether the emissions changes are a result of construction. The minor source baseline date is the earliest date after a so-called "trigger date" on which a complete application for a major source or major modification is submitted for approval to a reviewing authority.[59]

EPA further explains the role of the major source baseline date as follows:

> The major source baseline date is the date after which emissions changes resulting from construction at any new or modified *major* stationary source affect the amount of increment used. The Act established January 6, 1975 as the major source baseline date for the statutory increments for particulate matter and SO_2.[60]

The meaning of the *major source* baseline date becomes important only in the context of increment consumption analysis—a topic addressed in Part II of this Article.

At this point, our concern is more limited: when is the baseline concentration value established? The regulations provide the answer: the baseline concentration value will be established on "the earliest date after the trigger date" on which a complete PSD permit application[61] is submitted—stated another way, on what the regulations confusingly[62] call the "*minor source* baseline date." Because this is the most significant occasion—the event at which the baseline concentration value is computed[63]—it is common to refer to the minor source baseline date as simply the "baseline date."

Figure 11 depicts the major source baseline dates and the trigger dates for the PSD program but does not attempt to depict the minor source baseline dates. Those dates—which cannot occur until after the so-called trigger dates—are random, chaotic, and utterly at the whim of actors who choose to construct and modify polluting facilities. Whenever these actors engage in behavior triggering the need for the first PSD permit in a given part of the country and submit their completed PSD permit applications, the baseline date has been triggered and the increment consumption clock begins running. It is technically the minor source baseline dates that resemble flashbulbs at a rock concert.[64]

D. The Pollutant-Specific Nature of Baseline Dates

We now know how the most important baseline date is defined by the regulations: the date of the first completed PSD permit application in an area. The ambient air concentration

58. 40 C.F.R. §§51.166(b)(14), 52.21(b)(14) (2005) (emphasis added).

59. 53 Fed. Reg. at 40658. *See also* 45 Fed. Reg. at 52678 ("all changes in emissions, including those from minor sources and other types of changes at major sources, affect the available increment provided they occur after the baseline date").

60. 54 Fed. Reg. at 41219 (emphasis added). It is for precisely this reason that January 6, 1975, is called the major source baseline date for PM_{10} and SO_2.

61. The issue of *when* a PSD permit is needed—and hence, when a PSD permit application must be submitted—is an extraordinarily complicated and controversial aspect of the program. *See* STENSVAAG, *supra* note 14, at 480-90. The statute requires a PSD permit for the "construction" of a "major emitting facility." CAA §165(a)(1), 42 U.S.C. §7475(a)(1). "Major emitting facility" is defined in CAA §169(1), 42 U.S.C. §7479(1). "Construction" is defined in CAA §169(2)(C), 42 U.S.C. §7479(2)(C), to include "modification" of an existing facility.

62. The confusing "minor source baseline date" label can be traced to one consequence that flows from the establishment of this date:

> [U]ntil the time that the minor source baseline date is triggered, minor source emissions that exist in the . . . area will become part of background emissions for the area. Once the minor source baseline date is triggered, all new growth from minor sources will begin consuming increment.

60 Fed. Reg. 47297, 47298 (Sept. 12, 1995).

63. *See* 40 C.F.R §§51.166(b)(13)(i), 52.21(b)(13)(i) ("Baseline concentration means that ambient concentration level that exists in the baseline area at the time of the applicable minor source baseline date.").

64. Thus, for example, the baseline date in Rhode Island was established on June 5, 1981, by the Rhode Island Solid Waste Management Corporation. *See* 48 Fed. Reg. 274, 275 n.1 (Jan. 4, 1983). The SO_2 baseline date for the commonwealth of Massachusetts was originally set as August 4, 1978, based on the PSD permit application of the Massachusetts Municipal Wholesale Electric Company. *See* 45 Fed. Reg. 82251 (Dec. 15, 1980).

existing as of this date will thenceforth be considered the baseline concentration value. Does this mean that baseline values are set at that time for all three of the pollutants for which the PSD program has established an increment system: PM_{10}, SO_2, and NO_2? Stated another way, is each location in the nation given a single baseline date?

EPA has concluded that the answer should be no. "Baseline dates are pollutant specific and [are] established by the first PSD application of a source with significant emissions of the applicable pollutant."[65] The regulation provides in pertinent part:

> The baseline date is established for each pollutant for which increments . . . have been established if . . .
>
> (b) In the case of a major stationary source, the pollutant would be emitted in significant amounts, or, in the case of a major modification, there would be a significant net emissions increase of the pollutant.[66]

Thus, for example, if a proposed major emitting facility operator submits a completed PSD permit application (first in the area) for a facility that will emit large quantities of PM_{10} but less than "significant" amounts of SO_2 or NO_2, EPA has provided in its regulations that the baseline date has only been triggered for PM_{10}.[67] For the same reason, the baseline concentration value will be established solely for PM_{10}. For shorthand, we will sometimes refer to a pollutant emitted in sufficient amounts to trigger establishment of the baseline date as a "baseline pollutant."

Perhaps the following image will help to convey the random, chaotic nature of the baseline date creation process under the PSD program. Consider once more Figure 10, depicting a regime in which each of Tennessee's 95 counties is a separate baseline area. As one stares at the map over time, flashes of light sporadically appear in widely scattered counties; these lights represent the fact that a baseline date has just been set in Gibson County, and then a little later, in Sullivan County, and some time later yet, in Fayette County. That is one aspect of the flashbulbs-at-a-rock-concert metaphor for PSD baseline dates. But the pollutant-specific nature of the baseline date definition further complicates the image. It is as if the flash going off in Gibson County happened to be a green one (for PM_{10}), while the flash going off in Sullivan County was a red one (for NO_2), and the flash going off in Fayette County was a double-header: green (for PM_{10}) and yellow (for SO_2). Each of these random bursts represents the fact that a baseline date has been established, a baseline concentration value has been computed, and an increment consumption clock has started to run.

E. Baseline Dates and Air Quality Designations

One further wrinkle in the baseline date definition is that a baseline date cannot occur in any area that has not been designated as attainment or unclassifiable[68] for the increment pollutant at issue. The regulation provides in pertinent part:

> The baseline date is established for each pollutant for which increments or other equivalent measures have been established if . . .
>
> (a) The area in which the proposed source or modification would construct is designated as attainment or unclassifiable . . . for the pollutant on the date of its complete application . . . .[69]

In the early years of the PSD program, this language apparently precluded the establishment of baseline dates in some locations because of delays in making the initial designations.[70] The language is still important because portions of the country are continually being redesignated from nonattainment to attainment status as they bring their air quality into compliance with NAAQS.[71] In such locations, baseline dates were not possible prior to the redesignations.

F. Baseline Date Persistence: Withdrawn Applications and Permit Denials

Because the baseline date is defined as the date of the first completed *application* for a PSD permit in an area, EPA has concluded that the baseline date (and its associated baseline concentrations and ceilings) must persist even if the application is subsequently withdrawn or the permit is denied. The Agency has explained its position as follows:

> If the applicant that established the baseline date is later denied a PSD permit or voluntarily withdraws its PSD application, a question arises as to whether the baseline date has been triggered. In the Administrator's judgment the applicable baseline date remains in place, since no change in date is authorized under the Act. Section 169(4) establishes source application as the baseline triggering mechanism and does not qualify this by the later issuance of a permit. This policy is consistent with

65. 45 Fed. Reg. at 52681. *See also* 58 Fed. Reg. at 31631 ("the minor source baseline date is established for a particular pollutant (1) on the date a complete application is received by the permitting authority, and (2) when the proposed source would have the potential to emit that pollutant in a significant amount").The Agency justified the use of pollutant-specific baseline dates as follows:

> [A] pollutant-specific baseline is consistent with section 169(4) and the statutory structure. Section 169(4) requires that a baseline concentration be established "with respect to a pollutant . . . in an area subject to (Part C)." Therefore, by the terms of the statute, a baseline concentration is established for individual pollutants. Moreover, such concentrations are established for areas subject to PSD. Section 107(d), which provides that areas designated attainment or unclassifiable are subject to PSD, requires designations to be made on a pollutant-specific basis. Section 107(d)(1)(D) and (E). To be consistent, both baseline date and baseline area (and any subsequent redesignations under section 107 of the Act) must also be pollutant-specific.

45 Fed. Reg. at 52717.

66. 40 C.F.R §§51.166(b)(14)(iii), 52.21(b)(14)(iii) (2005). For most purposes, "significant" means 15 tons per year of PM_{10} emissions or 40 tons per year of SO_2 or NO_2 emissions. *See id.* §§51.166(b)(23)(i), 52.21(b)(23)(i).

67. EPA provides another example of how the pollutant-specific baseline works in 45 Fed. Reg. at 52717.

68. For an explanation of these terms, see *supra* note 17.

69. 40 C.F.R. §§51.166(b)(14)(iii), 52.21(b)(14)(iii).

70. *See, e.g.,* 48 Fed. Reg. 33866 (July 26, 1983) (addressing electric utility's argument that no baseline date could have been triggered in Florida prior to EPA's designation of attainment status for that state on March 3, 1978). The TSP to PM_{10} transition, *see supra* note 28, and revisions in the PM_{10} standard have also led to temporary situations in which baseline dates could not be triggered. *See, e.g.*, 64 Fed. Reg. 12257, 12261 (Mar. 12, 1999) ("upon revocation of the pre-existing [PM_{10}] NAAQS and associated nonattainment designation for areas . . . that were designated nonattainment for [PM_{10}], the [PM_{10}] increments will not apply unless and until the area is designated attainment or unclassifiable for the revised [PM_{10}] NAAQS").

71. *See, e.g.,* 69 Fed. Reg. 62591, 62594 (Oct. 27, 2004); *id.* 62210, 62214 (Oct. 25, 2004).

> the establishment of a baseline concentration that is based on the available monitoring data, typically that gathered by the source applicant. The data to establish the baseline concentration would be available regardless of the eventual permit status of the baseline triggering application. Using source application also stabilizes the . . . permitting process. Later applicants can determine whether a baseline date has been set in an area by looking to whether a previous application has been filed, rather than needing to determine if the permit has been or will be issued.[72]

G. Baseline Date Rescissions Due to Changes in the Regulations

Paradoxically, even though EPA has taken the position that a baseline date persists when triggered by a withdrawn or denied PSD permit application, the Agency has declared that a change in its PSD regulations might, under some circumstances, justify the "untriggering" of certain baseline dates. It is almost as if the location is given a "do-over," erasing the baseline concentration (and ceiling) values and restoring the baseline date clock to an untriggered state. The Agency has articulated this policy in two contexts.

First, when EPA amended its major emitting facility definition in response to the *Alabama Power* case,[73] it recognized that some baseline dates had been inappropriately triggered between the effective date of the 1978 regulations and the court-ordered revision of those regulations:

> One commenter questioned whether baseline dates would be triggered by permit applications previously filed by sources that were major under the June 1978 PSD regulations, but no longer major under the regulations promulgated today, even if the permit applicant failed to apply for a permit rescission. EPA concurs in the commenter's suggestion that a subsequent permit applicant in any area may inform the permitting authority that the baseline date was not triggered on the date that a source which no longer qualifies as major applied for a PSD permit. As the commenter points out, this eliminates the need for an immediate rescission of all past permits affecting sources no longer subject to PSD review. It also avoids penalizing permit applicants if a source that is no longer major fails to apply for a permit rescission.[74]

In this first context, the change in regulations between 1978 and 1980 had the effect of removing from major emitting facility status some stationary sources whose PSD permit applications had triggered establishment of the baseline date—sources that according to *Alabama Power*, should never have required PSD permits. EPA's decision to eliminate such baseline dates seems an appropriate recognition that the court had overturned the relevant portions of the 1978 regulations.[75]

Second, when EPA substituted PM_{10} increments for total suspended particulate (TSP) increments following its revision of the particulate NAAQS,[76] it recognized that some baseline dates may have been triggered by the PSD applications of facilities whose TSP emissions were sufficient to require establishment of the baseline but whose PM_{10} emissions had not been sufficient to trigger the baseline date.[77] The Agency explained:

> [I]t would be inappropriate to retain a TSP minor source baseline date when it can be shown that the [PM_{10}] emissions from the source triggering the baseline date were de minimis. In arriving at this conclusion, EPA considered existing policy concerning the triggering of the minor source baseline date. That policy, in part, provides that a minor source baseline date will no longer be considered set if the source which triggered the baseline date by submitting a complete permit application no longer qualifies for that permit as a result of changes to the PSD requirements (so as to make such source eligible to have the permit rescinded).[78]

The foregoing principle with respect to TSP minor source baseline dates is now codified in the regulations:

> Any minor source baseline date established originally for the TSP increments shall remain in effect and shall apply for purposes of determining the amount of available [PM_{10}] increments, except that the reviewing authority may rescind any such minor source baseline date where it can be shown, to the satisfaction of the reviewing authority, that the emissions increase from the major stationary source, or the net emissions increase from the major modification, responsible for triggering that date did not result in a significant amount of [PM_{10}] emissions.[79]

In this second context, the change in regulations redefined how particulates are measured; emissions of these pollutants measured by the old method (TSP) may have required establishment of the baseline, but emissions measured by the new method (PM_{10}) might not have required establishment of the baseline. EPA's reasons for eliminating the baseline date in this context may be a bit less persuasive than those articulated in the first context, but its approach to the second context is a defensible exercise of agency discretion.

Although EPA's articulation of the baseline date untriggering principle was issued in the foregoing two limited contexts, the principle may be sufficiently broad to address all occasions for which a baseline date has been triggered by the PSD permit application of a facility later found—due to a change in regulations—to emit the relevant

72. 45 Fed. Reg. at 52717. *See also* 58 Fed. Reg. at 31631 ("once a minor baseline date is set by a particular source via the submittal of a complete PSD permit application, such date will remain in effect even when the application is voluntarily withdrawn or the permit is denied").

73. *See supra* notes 4-6 and accompanying text.

74. 45 Fed. Reg. at 52717. *See also* 58 Fed. Reg. at 31631 n.19 (the policy of baseline date persistence contains "an exception . . . for any source originally defined as major under the June 1978 PSD regulations, but which was no longer considered major as a result of regulatory changes promulgated on August 7, 1980").

75. In proposing the 1980 revisions, EPA explained:

> [S]ources applying for PSD permits under the existing regulations which would not qualify as major construction under the final regulation, would not trigger the baseline date. Similarly, sources that were not subject to the existing regulations but would be under the final ones would not have triggered the baseline date since no PSD application was filed. This definition is proposed to conform to the court's mandate . . . .

44 Fed. Reg. 51924, 51941-42 (Sept. 5, 1979).

76. *See supra* note 28.

77. The baseline date is triggered only for those increment pollutants emitted in significant amounts by a major emitting facility—not for all pollutants emitted by such facilities. *See supra* notes 65-67 and accompanying text.

78. 58 Fed. Reg. at 31631.

79. 40 C.F.R. §51.166(b)(14)(iv). *See also id.* §52.21(b)(14)(iv).

pollutant in insufficient amounts to trigger establishment of the baseline.

H. State Variations on the Minor Source Baseline Date

One final baseline date complication is that states are free to define the minor source baseline date in a different manner than the definition specified in the EPA regulations as long as they comply with the requirement that state variations be no less stringent than those that would be imposed by the federal program.[80]

Some states have provided a uniform baseline date for establishing baseline concentrations. Montana, for example, did not amend its regulations when EPA bifurcated the baseline date definition into major source and minor source baseline dates.[81] Nevertheless, because Montana had established fixed baseline dates for the increment-consuming pollutants in its definition of "baseline date,"[82] EPA concluded that Montana's rules were no less stringent than the revised EPA rules; accordingly, the distinction between "minor source baseline date" and "major source baseline date" was not necessary.[83]

Nevada presents an additional illustration of state variations involving uniform baseline dates. In 2004, Nevada sought to amend its state implementation plan (SIP) to replace a uniform minor source baseline date of August 7, 1977, in the various PSD baseline areas in Clark County with a baseline date definition consistent with the federal regulations.[84] EPA struggled with the ramifications of the requested SIP amendment:

> EPA approval of this definition to supercede the [existing] SIP definition would have the effect of untriggering (completely) the minor source baseline dates for PM and SO_2 in those section 107(d) attainment or unclassifiable areas in which no source or modification has submitted a complete PSD application or would have a significant impact. Examples of such areas include [three hydrographic areas] . . . .
>
> For those areas in which a source or modification has submitted a complete PSD application or would have a significant impact, EPA approval would have the effect of establishing a new minor source baseline date for PM or SO_2 or both, i.e., from August 7, 1977 to various different (more recent) dates in the applicable areas. Examples include Las Vegas Valley (HA 212), which would have a new minor source baseline date for SO_2 of April 25, 1996 (triggered by a complete PSD application submitted by TIMET) and Black Mountains (HA 215), which would have a new minor source baseline date for PM of December 14, 1990 (triggered by a complete PSD application submitted by NCA #2).
>
> Arguably, untriggering (or re-establishing new, more recent) minor source baseline dates represents a relaxation because a greater level of air quality degradation would be allowed compared to a regulatory scheme in which the baseline date and concentration is set uniformly for all areas at August 7, 1977. However, this particular type of change aligns the Clark County [PSD] program with . . . section 169(4) of the [CAA] and thus, can also be viewed as a correction rather than as a relaxation. We conclude, therefore, that approval of the . . . submittal would serve the Congressional purposes described in the *Alabama Power* decision, and that the untriggering (or re-setting) of PSD minor source baseline dates in Clark County under these circumstances would be consistent with . . . the Act. . . .[85]

Other states have decreed that the minor source baseline date will ordinarily be the date of the first PSD permit applicant in an area but, in any event, may be no later than a specified date. For example, Wyoming provided in its SIP that the minor source baseline date would be triggered "no later than January 1, 1996."[86] When the state subsequently sought to revise its SIP to change that date to January 1, 2001, EPA approved the revision, saying:

> [T]he State is not required by EPA to set a mandatory minor source baseline date. The State is only required to have the minor source baseline date be triggered by the first complete PSD permit application for a major stationary source or major modification locating in or significantly impacting an attainment/unclassifiable area . . . and the State's definition of "minor source baseline date" meets that requirement. Thus, since the State definition is more stringent than the Federal definition, it is approvable.[87]

The requirement that state variations be no less stringent than their federal counterparts can pose subtle issues in the context of fixed baseline dates. At one point, EPA discussed the possibility that Wyoming SIP language establishing a fixed baseline date of August 7, 1977, might not be approvable because the triggering of a later baseline date (under the federal definition) might be more protective of air quality:

> The EPA review of the submittals identified only one provision in which the Wyoming regulations might not be approvable. The Wyoming PSD regulation establishes a uniform baseline date of August 7, 1977. Federal regulations require the baseline date to be the earliest date after August 7, 1977 that a PSD source submits a complete application. The Wyoming definition could result in a less stringent, lower baseline concentration if, after August 7, 1977, a decrease in emissions were achieved somewhere in the State. In a July 1, 1981, letter to EPA, Wyoming stated that no such decreases occurred in the State before the baseline [date] would have been triggered under EPA regulations, and that therefore its definition is at least as stringent as EPA's requirements. EPA agrees with the Wyoming determination.[88]

IV. Baseline Areas: Slicing, Dicing, and Resizing

As noted in the initial simplistic, theoretical overview, the definition of "baseline area" has a profound impact on when

80. *See* CAA §116, 42 U.S.C. §7416.

81. *See supra* notes 57-64 and accompanying text.

82. *See* 56 Fed. Reg. 23808, 23809 (May 24, 1991) ("the State currently employs a statewide baseline area with a statewide baseline date of February 8, 1988 for NO_2"). At one point, Wyoming had a uniform baseline date throughout the state for TSP. *See* 58 Fed. Reg. 4348, 4348 (Jan. 14, 1993) (describing uniform baseline date of August 7, 1977, and finding it more stringent than the federal baseline date definition). *See also* 56 Fed. Reg. 23810, 23811 (May 24, 1991).

83. *See* 56 Fed. Reg. at 23809.

84. *See* 69 Fed. Reg. 31056, 31061 (June 2, 2004).

85. *Id.*

86. 60 Fed. Reg. 55792, 55796 (Nov. 3, 1995).

87. *Id.*

88. 47 Fed. Reg. 41598, 41598 (Sept. 21, 1982).

the baseline and ceiling concentrations are established and when the increment consumption clock begins to run.[89] Despite the importance of this geographic PSD component, the CAA provides little guidance on the "baseline area" issue, mentioning it only vaguely and indirectly. The statute defines "baseline concentration" as the ambient concentration of an increment pollutant prevailing at the time that the first PSD permit application is filed "in an area."[90] However, the CAA "does not specify what constitutes 'an area.'"[91] The task of pouring meaning into this phrase has fallen to EPA, which has struggled to develop a coherent approach to the geography of baselines, increments, and ceilings.

A. A False Start: Defining the Baseline Area by Reference to Air Quality Control Regions

As previously noted, the *Alabama Power* court rejected EPA's attempt to establish a single nationwide baseline date for PSD purposes.[92] We also saw that the Agency responded to that decision by defining the baseline date as the date of the first complete PSD permit application in an area.[93] As a part of that revised definition, EPA's proposed 1979 draft[94] would have defined the baseline area as "all parts of an Air Quality Control Region (AQCR) designated as attainment or unclassifiable under section 107(d) of the Act."[95] Had this approach been adopted, a PSD permit application in any part of an AQCR designated as attainment or unclassifiable would have triggered the baseline date in all portions of the AQCR.[96]

The Agency explained its reasons for the proposed AQCR approach to PSD geography as follows:

> In formulating its proposed definition of "area subject to [the PSD] part," EPA weighed the ease of administration under competing interpretations. The courts have recognized that a policy of regularity and simplicity in regulation should be respected. . . . Under EPA's proposal, the baseline date is uniform for all clean air areas throughout an AQCR; this minimizes the administrative problems that would result from the profusion of different baseline starting points in the same AQCR. For example, if "area" was defined by a source's area of impact, cumbersome recordkeeping procedures would be required. As more sources applied for PSD permits, areas of source impact would begin to overlap and the system would grow more complex. Such a system would be difficult for EPA to implement at a national level.[97]

The proposed AQCR approach to defining the baseline area was not popular:

> [F]ifty-three commenters felt that an AQCR definition of baseline area would not produce a great deal of administrative relief and would, simultaneously, limit an area's growth options. These commenters favored defining baseline area as the area of significant source impact, based on required modeling and monitoring analysis. Such an approach was claimed to provide just as much administrative relief, more growth options, and elimination of the problem of a small PSD source triggering the baseline date for a large area. Seventeen commenters favored a baseline area definition geared to areas designated as clean or unclassified under section 107. Those favoring this alternative strongly preferred a "redesignation" procedure to accompany this option. Other commenters objecting to the AQCR approach suggested: county boundary lines (three), and the entire state (one).[98]

Finding merit in these arguments,[99] EPA relented and went back to the drawing board.

B. The 1980 Redraft: Defining the Baseline Area by Reference to Designated Attainment and Unclassifiable Areas

EPA's 1980 redraft defined "baseline area" to mean the area designated as attainment or unclassifiable under §107(d) in which the first PSD permit applicant's emissions of the relevant increment pollutant or pollutants would have a significant impact.[100] The Agency reasoned that this approach was faithful to both the statute and the *Alabama Power* decision:

> This view is strongly suggested by Judge [Spottswood William] Robinson's opinion on baseline concentration in . . . *Alabama Power* . . . . Referring to Congress' intent to use actual air quality data to establish baseline concentrations, Judge Robinson states that "the task of monitoring existing ambient pollution levels in attainment areas is assigned to the first permit applicant, who will provide the information essential to calculation of the baseline." . . . The footnote which follows that sentence discusses a state's obligation under section 107(d)(1) to submit area designations to EPA and the fact that section 107 lists submitted to date by the states indicate that many areas lack acceptable air quality information. . . . The references to attainment areas and section 107(d) designated areas indicate that the court interprets the statute as requiring that baseline concentrations be calculated for each clean area designated under section 107(d)(1).[101]

The core of this 1980 approach persists in the current baseline area definition.

C. The Current Regulatory Baseline Area Definition

The relevant language of EPA's PSD regulations now provides:

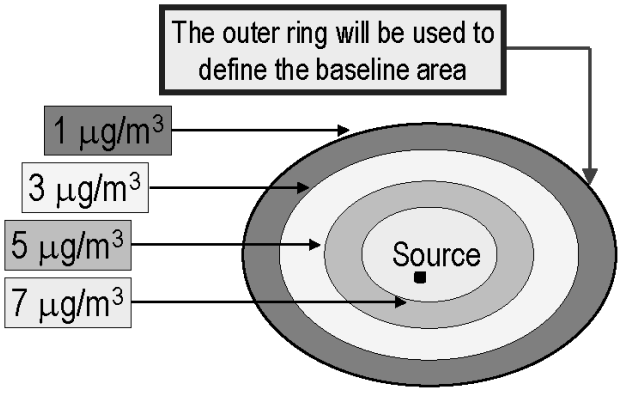
> Baseline area means any intrastate area (and every part thereof) designated as attainment or unclassifiable . . . in

89. *See supra* notes 38-44 and accompanying text.
90. CAA §169(4), 42 U.S.C. §7479(4).
91. 47 Fed. Reg. 3011 (Jan. 21, 1982).
92. *See supra* notes 49-56 and accompanying text.
93. *See supra* notes 57-64 and accompanying text.
94. *See* 44 Fed. Reg. at 51941 ("EPA generally intends to define 'area subject to this part' on the basis of [Air Quality Control Regions (AQCRs)]").
95. 45 Fed. Reg. at 52714. Section 107 of the statute provides for the designation by the EPA Administrator of AQCRs, which may be interstate or intrastate areas. *See* CAA §107(b)-(c), 42 U.S.C. §7407(b)-(c). EPA has designated approximately 265 AQCRs. *See* 40 C.F.R. §§81.12-81.356 (2004). They have descriptive names, such as "Steubenville-Weirton-Wheeling Interstate Air Quality Control Region," and "Northeast Mississippi Intrastate Air Quality Control Region." *See id.*
96. *See* 45 Fed. Reg. at 52714.
97. 44 Fed. Reg. at 51942.
98. 45 Fed. Reg. at 52715.
99. The Agency concluded that "neither the statute nor the [*Alabama Power*] opinion support the proposed AQCR approach." *Id*.
100. *See id.*
101. *Id*.

> which the major source or major modification establishing the minor source baseline date would construct or would have an air quality impact equal to or greater than 1 μg/m^3 (annual average) of the pollutant for which the minor source baseline date is established.[102]

This seems straightforward enough. Using Figure 12, if we picture a stationary source emitting sufficient quantities of an increment pollutant (such as SO_2) to trigger the baseline date, we can imagine a plume bearing that pollutant into the ambient air and away from the facility. Near the release point, the concentration of that pollutant in the plume will be relatively high; as the plume dissipates into and becomes diluted by the ambient air, the concentration of the pollutant will become less and less. Eventually, there will be a point where the concentration of the baseline pollutant at the edge of the plume falls to the level of 1 μg/m^3.[103] EPA sometimes calls the location embraced by this 1 μg/m^3 boundary the "significant impact area"[104] or the "area of significant impact."[105]

Figure 12: Calculating the 1 μg/m^3 Significant Impact Area Boundary



Calculating the 1 μg/m^3 boundary is one of the tasks of the first PSD permit applicant in an area—the applicant responsible for establishing the baseline concentration for one or more increment pollutants. Because a PSD permit must be sought and obtained before engaging in the construction or modification of a major emitting facility, the applicant cannot actually measure the concentrations in the ambient air of the not-yet-emitted plume. Instead, the applicant must resort to air quality modeling to predict where that 1 μg/m^3 boundary will occur.[106] If the applicant will emit more than one increment pollutant in sufficient amounts to trigger the baseline date, a separate calculation like that depicted in Figure 12 must be undertaken for each of the baseline pollutants and may, of course, result in areas of significant impact for the separate pollutants that vary considerably in their geographic reach.

D. The Critical Role of the Part 81 Listings

The foregoing calculation is just the first step in the analysis, however. The regulations do not say that the baseline area is the geographic location embraced by the 1 μg/m^3 boundary—the area of significant impact. Instead, the regulations provide that the baseline area is "any intrastate area . . . designated as attainment or unclassifiable . . . in which" the PSD permit applicant would have the 1 μg/m^3 air quality impact.[107]

What is meant by the phrase "area . . . designated as attainment or unclassifiable"? EPA has explained that the regulations "define 'baseline areas' in terms of the attainment or unclassifiable areas listed in 40 CFR part 81."[108] Subpart

102. 40 C.F.R. §§51.166(b)(15)(i), 52.21(b)(15)(i). The regulation further provides for the possibility of baseline area "redesignations"—a mechanism for altering the size of the baseline area. *See id.* §§51.166(b)(15)(ii), 52.21(b)(15)(ii). Baseline area redesignations are addressed *infra* at notes 123-80 and accompanying text.

103. The shape of any given plume will depend on meteorological conditions—such as wind speed, wind direction, and atmospheric stability—during the period of measurement or modeling. For example, a plume depicting pollutant movement during a single calm day might have an appearance somewhat like that depicted in Figure 12, spreading out in each compass direction in a crudely equal manner. On a single windy day, a plume might spread out exclusively in the direction of the prevailing wind, leaving other points of the compass untouched. For plumes measured or monitored over the course of an entire year, the boundaries will reflect annual average meteorological conditions. For a more detailed discussion of atmospheric transport and modeling, see John-Mark Stensvaag, *Regulating Radioactive Air Emissions From Nuclear Generating Plants: A Primer for Attorneys, Decisionmakers, and Intervenors*, 78 NW. U. L. REV. 1, 41-46, 139-51 (1983).

104. *See, e.g.,* 58 Fed. Reg. at 4349; 45 Fed. Reg. at 52721.

105. *See, e.g.,* 48 Fed. Reg. 15273, 15274 (Apr. 8, 1983); 48 Fed. Reg. 46782, 46783 (Oct. 14, 1983). When EPA chose to use this method for determining the area of significant impact for PSD baseline purposes, it explained:

> A source will be considered to impact an area if it has an impact of 1 μg/m^3 or more of SO_2 or PM on an annual basis. This figure has been selected because it corresponds to levels of significance used in previous Agency determinations for SO_2 and PM. The annual average was selected over the short term value due to its ease of implementation. That is, the shape of source impact areas is less complex and the 1 μg/m^3 annual average provides ample area coverage of the source impact area.

45 Fed. Reg. at 52716.

For the annual average increments in Table 2, EPA has also used the 1 μg/m^3 value to specify when a "full impact analysis" for increment consumption can be eliminated. *See* John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: Baselines, Increments, and Ceilings—Part II,* 36 ELR 10003, at notes 148-56 and accompanying text (forthcoming Jan. 2006) [hereinafter *Part II*].

106. EPA publishes and regularly updates a *Guideline on Air Quality Models*, 40 C.F.R. pt. 51, app. W, a document that specifies models and provides guidance for their use. The PSD regulations provide: "All applications of air quality modeling involved in this subpart shall be based on the applicable models, data bases, and other requirements specified in appendix W." 40 C.F.R. §§51.166(*l*)(1), 52.21(*l*)(1) (2005).

107. The grammar of EPA's "baseline area" definition is a bit baffling. The regulations may be read to provide two options for defining the baseline area: (1) any intrastate area designated as attainment or unclassifiable in which the PSD permit applicant "would construct"; *or* (2) any such area in which the PSD applicant would have the 1 μg/m^3 air quality impact. *See* 40 C.F.R. §§51.166(b)(15)(i), 52.21(b)(15)(i). It is hard to know what to do with the first option, given the conjunctive word "or" that connects it to the second option. If a PSD permit applicant will construct in one attainment area in which it (somewhat mystically) will not have a 1 μg/m^3 impact, but its plume would have a 1 μg/m^3 impact in an adjacent intrastate attainment area, the regulations must probably be construed to provide that both of the affected attainment areas fall within the single baseline area.

108. 67 Fed. Reg. 12474, 12476 (Mar. 19, 2002).

C of Part 81 contains an extraordinarily detailed listing of air quality designations, varying widely in specificity.

Some attainment and unclassifiable areas are designated by reference to complete AQCRs.[109] Others are designated by reference to counties,[110] hydrographic areas,[111] or detailed descriptions of township and section boundaries and the like.[112] Many are designated simply as "Entire State."

In Wyoming, for example, tables list "Entire State" as attainment ("better than national standards") for SO_2 and as attainment or unclassifiable ("cannot be classified") for NO_2.[113] The more complex PM_{10} table for Wyoming is depicted in Figure 13. The footnote in that table also indicates the default position for EPA when it comes to the phrase "Rest of State." Unless a state has engaged in the redesignation process described below, EPA has declared that the phrase "Rest of State" denotes a single baseline area containing all portions of a state not described in preceding lines in the table.[114]

Figure 13: Wyoming PM_{10} Attainment Designations[115]

Designated Area	Designation	
	Date	Type
Sheridan County:		
City of Sheridan	11/15/90	Nonattainment
Trona Industrial Area	11/15/90	Unclassifiable
Campbell County (part)	11/15/90	Unclassifiable
Converse County (part). That area bounded by Township 40 through 52 North, and Ranges 69 through 73 West, inclusive of the Sixth Principal Meridian, Campbell and Converse Counties, excluding the areas defined as the Pacific Power and Light Area, the Hampshire Energy Area, and the Kennecott/Puron PSD Baseline Area.—Powder River Basin.		
Campbell County (part), That areabounded by NW1/4 of Section 27, T50N, R71W, Campbell County, Wyoming—Pacific Power and Light Area.	11/15/90	Unclassifiable
Campbell County (part), That area bounded by Section 6 excluding the SW¼; E½ Section 7; Section 17 excluding the SW¼; Section 14 excluding the SE¼; Sections 2, 3, 4, 5, 8, 9, 10, 11, 15, 16 of T48N, R70W and Section 26 excluding the NE¼; SW¼ Section 23; Sections 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35 of T49N, R70W.—Hampshire Energy Area.	11/15/90	Unclassifiable
Campbell County (part), That area described by the W½SW¼ Section 18, W½NW¼, NW¼SW¼ Section 19, T47N, R70W, S½ Section 13, N½, N½SW¼, N½SE¼ Section 24, T47N, R71W.—Kennecott/Puron PSD Baseline Area.	11/15/90	Unclassifiable
Rest of State[1]	11/15/90	Unclassifiable

[1] Denotes a single area designation for baseline area purposes.

The Part 81 listings pose interpretive challenges about the geographic reach of baseline concentration values. For example, the "Entire State" of Wyoming is classified as attainment for SO_2; does this mean that the first PSD permit applicant seeking to emit more than de minimis quantities of SO_2 triggers the SO_2 baseline date for all of Wyoming? If so, a single SO_2 baseline concentration value—and a single ceiling—will be established for this pollutant, and the increment consumption clock will commence to run for all locations in Wyoming.

EPA's position on this issue has been that the baseline date is, indeed, triggered for the entire attainment or unclassifiable "area"—as listed in Part 81—even if that area is as large as an entire state.[116] Massachusetts found itself in this situation in the late 1980s, and EPA declared:

> Currently, the entire Commonwealth of Massachusetts is treated as a single attainment area for NO_2. The first complete application from a source which would have a significant impact on the concentration of NO_2 (an increase in concentration of at least 1 $\mu g/m^3$) would trigger the minor source baseline for the entire state.[117]

Thus, the language chosen in Part 81 to describe each attainment or unclassifiable area controls the geographic reach of the baseline concentration value established by the first PSD permit in that area.

109. *See, e.g.,* 40 C.F.R. §81.333 (2004) (NO_2 table for New York). For an explanation of AQCRs, see *supra* note 95.

110. *See, e.g.,* 40 C.F.R. §81.324 (2004) (SO_2 table for Minnesota).

111. *See, e.g., id.* §81.329 (PM_{10} and NO_2 tables for Nevada). A footnote to the NO_2 table explains that "Rest of State refers to hydrographic areas as shown on the State of Nevada Division of Water Resources' map titled Water Resources and Inter-basin Flows (September 1971), excluding the designated areas specifically listed in the table," and the PM_{10} table contains a similarly worded footnote. *Id.*

"A hydrographic area is a regional designation that follows natural movements in water flow and air flow according to the area's geography and topography." Reno-Sparks Indian Colony v. EPA, 336 F.3d 899, 903 n.2, 33 ELR 20240 (9th Cir. 2003). There are more than 250 hydrographic units in Nevada. *See* 67 Fed. Reg. at 12475.

In 2002, EPA published a notice purporting to clarify that references in 40 C.F.R. §81.329 to "rest of state" and "entire state" did not refer to a single Nevada baseline area but to more than 250 distinct hydrographic areas, each of which constitutes its own separate baseline area. *See* 67 Fed. Reg. at 12475. This action was challenged and upheld in *Reno-Sparks Indian Colony*, 336 F.3d at 906 ("We uphold the 2002 Nevada Rule because the administrative record supports [ ] EPA's interpretation that Nevada originally proposed 254 baseline areas, and that [ ] EPA in 1978 adopted that proposal and never changed it in any relevant respect."). *See also infra* note 136.

Because "rest of state" and "entire state" always referred to the distinct hydrographic areas, the 2002 clarification did not result in the untriggering of any baseline dates. EPA explained:

> As an example, Sierra Pacific Power's submittal of a complete PSD permit application on March 11, 1994 for Tracy Generating Station established the [PM_{10}] minor source baseline date in hydrographic area 83. EPA's action today has no effect on the status of this basin, i.e., the basin remains triggered with the same minor source baseline date.

67 Fed. Reg. 68769, 68770 (Nov. 13, 2002). *See also infra* notes 150-53 and accompanying text, discussing Nevada's further subdivision of a single hydrographic area into multiple parts.

112. *See, e.g.,* 40 C.F.R. §81.351 (2005) (PM_{10} table for Wyoming), depicted in Figure 13.

113. *See id.* §81.351.

114. *See id.* §81.300(b) ("With respect to areas identified as 'Rest of State' it should be assumed that such reference comprises a single area designation for PSD baseline area purposes."). *See also* 56 Fed. Reg. 56694, 56709 (Nov. 6, 1991); 54 Fed. Reg. 8322, 8323 (Feb. 28, 1989) ("the first permit application filed within the 'Rest of State' could trigger a baseline air quality determination for the entire area").

115. 40 C.F.R. §81.351. The odd nature of Wyoming's Part 81 PM_{10} area listings, depicted in Figure 13, is explained *infra* at text accompanying notes 173-80.

116. *See* 47 Fed. Reg. 7696, 7698 (Feb. 22, 1982) ("the baseline area must encompass the entire attainment or unclassified area designated under section 107 of the Act in which a source would construct or would have an impact equal to or greater than 1 $\mu g/m^3$").

117. 56 Fed. Reg. 63464, 63465 (Dec. 4, 1991). *See also* 53 Fed. Reg. 15064, 15065 (Apr. 27, 1988) ("In Florida, the entire state is one baseline area, so it has one baseline date.").

E. Unraveling Confusion: Two Meanings for "Baseline Area"

The term "baseline area" is used, somewhat confusingly, to mean two closely related things (just as "baseline date" may mean different things). First, EPA often says that each separately designated attainment or unclassifiable area—even locations in which no PSD permit application has been submitted and no baseline date has been triggered—is a "baseline area."[118] This is somewhat misleading. If there has not yet been a completed PSD permit application in such an area, it is better to think of the location as a *potential* baseline area—a sort of baseline-area-in-waiting.[119]

Second, the term baseline area refers to an attainment or unclassifiable area (or areas) in which a completed PSD permit application has been submitted, triggering the baseline date and the calculation of a baseline concentration value. This is the definition of the term set forth in the regulations.[120] It is perhaps best to limit use of the term "baseline area" to such a "sho 'nuff" baseline area—a real one—in which the baseline date and concentration values have been established. There are many reasons for preferring such linguistic precision, including the fact that a single sho 'nuff baseline area—a real one—may encompass more than a single potential baseline area, because the real baseline area will encompass all potential baseline areas affected by its significant impact (1 $\mu g/m^3$) plume. Nevertheless, because EPA frequently uses the term "baseline area" in the sense of its first meaning, we cannot avoid using the term to refer both to potential baseline areas (attainment and unclassifiable areas denoted in Part 81) and genuine, triggered baseline areas.

F. Initial State Indifference to the Precise Wording of the Part 81 Listings

Despite the critical importance of the Part 81 listing descriptions, it is probably accurate to assume that many state officials initially failed to grasp that these listings had the potential to start the PSD increment consumption clock over vast distances. In the early years of PSD implementation following the 1977 CAA Amendments, state air pollution control officials had a great many tasks to distract them from the subtle nuances of the Part 81 listings. The 1977 CAA Amendments imposed numerous SIP redrafting obligations on state officials, involving highly controversial issues associated with nonattainment; many states struggled to comply with SIP revision deadlines, risking bans on stationary source construction and the loss of federal highway funds.[121]

Moreover, the precise wording of the Part 81 lists did not become important until EPA had struggled through various approaches to defining the baseline area:

> EPA originally interpreted section 169 as allowing the Agency to set a uniform baseline date for all areas in the Country. . . . Consequently, neither EPA nor the States thought that the designation of an area was [relevant] to the establishment of baseline ambient air quality data when the attainment designations were first promulgated, pursuant to section 107(d). 43 FR 8962 (March 3, 1978). Many States designated specific areas as nonattainment but submitted attainment and unclassifiable designations encompassing large areas, in some cases entire States, using phrases such as "entire States," "rest of State," etc.[122]

Whatever the reason, Part 81 has been peppered with attainment (and unclassifiable) area descriptions encompassing vast tracts of land.

G. EPA Invitation to Submit Baseline Redesignation Requests

When EPA published its 1980 PSD regulations, the Part 81 listing descriptions for attainment and unclassifiable areas began to serve a wholly new purpose: delineating baseline area boundaries for the PSD program. Because the listing descriptions had not been crafted with this new purpose in mind, the Agency emphasized that states would be free to request "baseline area redesignations"[123]—alterations in the size of the Part 81 attainment and unclassifiable areas:

> States will have the flexibility to redesignate clean or unclassified areas under section 107 and thereby remove baseline dates for certain areas. . . .
>
> Section 107(d) specifically authorizes states to submit redesignations to the Administrator. Consequently, states may submit redefinitions of the boundaries of attainment or unclassifiable areas at any time. If EPA agrees that the available data support the change, it will redefine the areas as requested. As long as no PSD source has located in, or significantly impacted on a clean area being considered for redesignation, the area can be redesignated as a new attainment or unclassifiable area, even if the area were previously part of a larger clean area in which the baseline date had been set. . . .
>
> The Administrator believes that defining baseline area as section 107 areas and allowing state redesignation will satisfy most of the commenters who objected to the proposed AQCR definition and favored state flexibility in designations. The redesignation process partially meets the concerns of commenters who preferred defining baseline area as source impact area. Where a baseline date is established for an area that is large relative to the impact area of the triggering source, the state has the option of redefining the area to reflect more accurately the area affected by the source. . . .
>
> Flexibility is inherent in state authority to redesignate areas under section 107. Thus, large tracts of land belong-

118. *See, e.g.*, 67 Fed. Reg. at 68770 (Nevada's 253 hydrographic areas are the "PSD baseline areas"); *id*. at 68770-71 (describing two "baseline areas" in which the baseline date had not yet been triggered); 54 Fed. Reg. 27342, 27342 (June 29, 1989) ("The 'attainment' or 'unclassifiable' areas are important . . . because they define the 'baseline areas.'"); 48 Fed. Reg. at 46782 ("In general, baseline areas are those designated attainment or unclassifiable under Section 107(d)."). *See also* Reno-Sparks Indian Colony v. EPA, 336 F.3d 899, 902, 33 ELR 20240 (9th Cir. 2003) (each of more than 250 hydrographic units "constitutes its own separate baseline area").

119. *See* 56 Fed. Reg. at 56709; 54 Fed. Reg. at 41232.

120. *See* 40 C.F.R. §§51.166(b)(15)(i), 52.21(b)(15)(i) (2005).

121. *See* STENSVAAG, *supra* note 14, at 496-505.

122. 47 Fed. Reg. at 3011.

123. The "baseline area redesignation" label is used in 67 Fed. Reg. 21194, 21196 (Apr. 30, 2002) (articulating "Criteria for Evaluating State Requests for PSD Baseline Area Redesignations"). *See also id.* at 68773.

> ing to one clean or unclassified PSD area can later be divided into several smaller PSD baseline areas with potentially different baseline dates. . . . A baseline date will, therefore, be triggered for the entire designated section 107 area unless nonimpacted portions are redesignated to smaller areas. . . .
>
> States are cautioned to carefully weigh any inclination to postpone baseline dates through area redesignations against increased difficulties associated with tracking increment consumption.[124]

Two years later, EPA reiterated its willingness to relieve states from overly broad Part 81 listing descriptions:

> [I]n many States where attainment designations have been made that encompass an entire State or large portions of a State, the first permit application filed within these areas could now trigger a baseline air quality determination for the entire area. These areas are typically much larger than the actual area of significant air quality impacts of a proposed source; triggering the baseline date for the entire area could therefore unnecessarily restrict growth in an area.[125]

To further ease the growth restrictions of broad Part 81 listing descriptions, the Agency proposed to amend its regulations to provide:

> Wherever the air quality status of a State or a portion of a State has been designated attainment or unclassifiable by a generally inclusive term such as "remainder of State," "rest of State," "rest of Air Quality Control Region," "Statewide," "entire State," "whole State," or other similar phrase, that State or portion thereof shall be deemed to be designated attainment or unclassifiable on a county-by-county basis, unless a State chooses to redesignate on some other appropriate basis.[126]

This proposal, which was not adopted, would have effectively redesignated in one fell swoop hundreds of baseline areas—busting them into individual counties—without even requiring that a state seek such relief. For example, EPA (through its unilateral action of promulgating a single regulatory revision) would have broken the "entire state" baseline area depicted in Figure 9 into the 95 individual county baseline areas depicted in Figure 10. To be sure, a state would still have been free to redesignate on a basis other than counties, but the proposed regulation would have created thousands of new baseline areas to replace dozens of existing areas. For each newly created baseline area not yet affected by the significant impact plume of a PSD permit applicant, any previously established baseline concentration value would have been zeroed out, and the increment consumption clock would have been reset.

Although the proposed wholesale county-by-county redesignation through a single EPA rule was not adopted, the mechanism of state-requested redesignations is now firmly established and has been used on numerous occasions to zero out baseline concentration values and reset increment consumption clocks. The Agency refers to this process as the "elimination" or "untriggering" of baseline dates.[127]

124. 45 Fed. Reg. at 52681, 52716, and 52726-27.

125. 47 Fed. Reg. at 3011.

126. Proposed 40 C.F.R. §81.300(b), *published at* 47 Fed. Reg. at 3012.

127. *See* 67 Fed. Reg. at 68770:

> [I]n some cases, a larger area where the minor source baseline date has been established (or "triggered") can be broken up into two or more smaller areas and such action could potentially result in the elimination of the minor source baseline date in one or more of the smaller areas ("untrigger" the areas) which subsequently do not contain the PSD source.

See also 60 Fed. Reg. 47297, 47298 (Sept. 12, 1995) ("[the] designation of the Powder River Basin as a separate baseline area . . . effectively 'untriggered' the particulate matter minor source baseline date").

H. Statutory Basis and EPA Criteria for Baseline Area Redesignations

The redesignation mechanism is authorized by the statute: "[T]he Governor of any State may, on the Governor's own motion, submit to the Administrator a revised designation of any area or portion thereof within the State."[128] The statute further provides: "within 18 months of receipt of a complete State redesignation submittal, the Administrator shall approve or deny such redesignation."[129] For the type of redesignation involved in the resizing of baseline areas, however, the statute provides no criteria:

> Section 107(d)(3) does not provide specific direction to EPA for evaluating redesignation requests that involve subdivision of existing attainment or unclassifiable areas, in contrast to requests that involve a change in the designation of a given area, e.g., from nonattainment to attainment (see section 107(d)(3)(E)) or from nonattainment to unclassifiable (see section 107(d)(3)(F)). However, section 107(d)(3)(A) of the Act, which describes EPA initiation of an area redesignation, indicates that redesignations may be initiated "on the basis of air quality data, planning and control considerations, or any other air-quality related considerations the Administrator deems appropriate." EPA believes it is reasonable to conclude that these considerations, provided in the Act as an appropriate basis for EPA-initiated redesignations, also provide some basis for EPA's evaluation of state-initiated redesignation requests.[130]

The Agency has promulgated regulations limiting the baseline area redesignation mechanism by reference to the plumes of PSD permit applicants.[131] Those limitations and their operation will be depicted in a series of diagrams a bit later in this analysis. The Agency has also articulated an additional uncodified criterion for approval of state baseline area redesignation requests: a change must not "interfere with a State's management of air quality."[132] The Agency appropriated this criterion from a portion of the statute addressed to the slightly different context of disputes between states and Native America tribes: "In resolving such disputes relating to area redesignation, the Administrator shall consider the extent to which the lands involved are of sufficient size to allow effective air quality management . . . ."[133]

EPA has articulated three circumstances in which this criterion might preclude redesignation:

> Some examples of the types of redesignations that might interfere with effective air quality management are those that would have the effect of untriggering a minor source

128. CAA §107(d)(3)(D), 42 U.S.C. §7407(d)(3)(D).

129. *Id.*

130. 67 Fed. Reg. at 21196.

131. *See* 40 C.F.R. §§51.166(b)(15)(ii), 52.21(b)(15)(ii) (2005).

132. 67 Fed. Reg. at 68775.

133. CAA §164(e), 42 U.S.C. §7474(e). *See* 67 Fed. Reg. at 68775.

> baseline date in an area affecting a Class I area or in an area where a substantial portion of the available increment has been consumed, redesignations that serve to carve out small "postage stamp" areas encompassing only the significant impact area around a major PSD source, or large-scale redesignations creating numerous small baseline areas with little or no basis in effective management of air quality.[134]

When one commenter asserted that such a criterion—if used to deny a state redesignation request—would violate the *Alabama Power* opinion, EPA noted that the baseline area redesignation device was not considered by or approved by the *Alabama Power* court:

> [A] commenter cites the *Alabama Power* decision as endorsing a State's use of section 107(d) redesignations to create new PSD baseline areas and untrigger minor source baseline dates, but the court in *Alabama Power* did not address this specific issue. The court emphasized the State's authority to manage the increment . . . but did not rule on States' use of section 107(d) redesignations as a means to create new PSD baseline areas . . . or to untrigger minor source baseline dates and thereby "baseline" the portion of the increment consumed prior to the redesignation. This practice has been allowed under EPA regulations but was not one of the issues before the court in the *Alabama Power* case.[135]

I. Do-Overs: Erasing the Baseline Value and Resetting the Increment Clock Through Baseline Area Redesignations

Starting with North Carolina—which made its request within days of EPA's 1980 invitation—at least 20 states have successfully invoked the redesignation mechanism to resize their baseline areas.[136] Over the course of more than 20 years involving four presidential administrations, not a single baseline area redesignation request has been denied. Indeed, given the ordinary preference of developers for small baseline areas and for maximum delay in triggering baseline dates,[137] it seems remarkable that many states have not yet subdivided very large tracts of land still listed as attainment or unclassifiable areas in Part 81.[138]

134. 67 Fed. Reg. at 21197 n.4.

135. 67 Fed. Reg. at 68775. When EPA says that the untriggering of the minor source baseline date will "'baseline' the portion of the increment consumed prior to the redesignation," the Agency uses "baseline" as a verb. This figure of speech describes the recharacterization of portions of the existing ambient air concentration from the "increment" category (a characterization that had moved the area closer to the ceiling) to the "baseline" category (a characterization that will eventually move the baseline concentration and ceiling higher than they otherwise would have been).

Thus, for example, when EPA approved the redesignation of an area in Wyoming, busting off the remainder of the Powder River Basin from the area affected by the 1 $\mu g/m^3$ plume of the first PSD permit applicant in the basin—the Kennecott/Puron facility—the Agency explained:

> This approval eliminates the minor source baseline date for particulate matter that was established in the Powder River Basin area by the submittal of a complete PSD permit application for the Kennecott/Puron facility. Thus, until the time that [a future] minor source baseline date is triggered, minor source emissions that exist in the Powder River Basin attainment area will become part of background emissions for the area.

60 Fed. Reg. at 47298. Those *existing* minor source emissions in the portion of the Powder River Basin not affected by the Kennecott/Puron 1 $\mu g/m^3$ plume had previously been chewing up increment in the single baseline area; now, in the newly split-off separate baseline area, they were "baselined"—reallocated from increment to baseline. *See also* 59 Fed. Reg. 32395, 32396 (June 23, 1994) ("thus, emissions from coal mines and other minor sources are no longer consuming particulate matter increment"). For additional analysis of the Wyoming Powder River Basin redesignations, see *infra* notes 173-80 and accompanying text.

136. *See* 46 Fed. Reg. 27933 (May 22, 1981) (redesignating the "Rest of State" and "Statewide" portions of the North Carolina particulate and SO_2 tables to a listing of individual counties); 46 Fed. Reg. 40007 (Aug. 6, 1981) (redesignating a single Missouri particulate and SO_2 attainment area into two countywide areas); 46 Fed. Reg. 40190 (Aug. 7, 1981) (redesignating the Massachusetts SO_2 attainment area from "Entire State" to 351 individual cities and towns); 46 Fed. Reg. 53415 (Oct. 29, 1981) (redesignating the "Rest of State" and "Statewide" portions of the South Carolina particulate and SO_2 tables to a listing of individual counties); 46 Fed. Reg. 55257 (Nov. 9, 1981) (redesignating "Remainder of AQCR" portions of the Virginia TSP and SO_2 tables to a listing of individual counties); 47 Fed. Reg. 20586 (May 13, 1982) (redesignating the Hamilton County, Ohio, SO_2 attainment area into two attainment areas); 48 Fed. Reg. 20231, 20232 (May 5, 1983) (approving Montana SIP revision changing the particulate baseline area definition from a county-by-county to an area of impact approach); 48 Fed. Reg. 46537 (Oct. 13, 1983) (redesignating the "Rest of State" and "Statewide" portions of the Georgia particulate and SO_2 tables to a listing of individual counties); 48 Fed. Reg. at 46782 (redesignating the "Entire State" and "Remainder of State" portions of the Kansas particulate and SO_2 tables to a listing of individual counties, except for combining Pottawatomie and Nemaha counties into one SO_2 attainment area due to the pre-existing PSD application of a facility with a plume significantly affecting both counties); 49 Fed. Reg. 30185 (July 27, 1984) (redesignating the "Rest of State" portions of the Tennessee particulate and SO_2 tables to a listing of individual counties); 51 Fed. Reg. 886 (Jan. 9, 1986) (redesignating the "Rest of State" portions of the Mississippi particulate and SO_2 tables to a listing of individual counties); 54 Fed. Reg. at 8322 (redesignating the "Rest of State" portions of the Kentucky TSP and SO_2 tables to a listing of individual counties); 54 Fed. Reg. at 27342 (clarifying that Part 81 "Entire State" or "Remainder of State" attainment and unclassifiable area listings for Alaska, Idaho, Oregon, and Washington are designated on the basis of AQCRs, or portions thereof); 55 Fed. Reg. 23932 (June 13, 1990) (redesignating North Dakota from an "Entire State" approach to two AQCRs, conforming to state practice and retaining previously triggered baseline dates and concentration values established for the two areas); 56 Fed. Reg. at 63464 (redesignating the Massachusetts NO_2 attainment area from "Entire State" to 351 individual cities and towns); 57 Fed. Reg. 48461 (Oct. 26, 1992) (redesignating the "Remainder of State" portions of the Minnesota Part 81 tables to a listing of individual counties); 58 Fed. Reg. at 4348 (redesignating a single Powder River (Wyoming) Basin PM attainment area into three areas, representing the two triggered areas of significant PM impact associated with two PSD permit applicants and the untriggered area of the basin not affected by their plumes); 60 Fed. Reg. at 47297 (splitting off yet more of the untriggered Powder River (Wyoming) Basin PM attainment area to create a new area affected by a new PSD permit applicant while preserving untriggered status in the remaining portion of the basin).

In 2002, EPA declared that it was "approving a request from the State of Nevada . . . to redesignate the current single unclassifiable area for [PM_{10}] into numerous individual areas." 67 Fed. Reg. at 68769. However, the U.S. Court of Appeals for the Ninth Circuit found in *Reno-Sparks Indian Colony v. EPA*, 336 F.3d 899, 909 & n.10, 33 ELR 20240 (9th Cir. 2003), that the Agency's action had been a clarification of existing designations, rather than a redesignation. *See also supra* note 111.

137. *See supra* notes 38-41 and accompanying text.

138. *See, e.g.,* 40 C.F.R. §81.301 (2004) ("Rest of State" listing for Alabama TSP attainment area and "Statewide" listing for SO_2 and NO_2 attainment areas); *id.* §81.303 ("Rest of State" designations for Arizona SO_2 and TSP and "Whole State" designation for NO_2 attainment areas); *id.* §81.306 ("Entire State" designation for Colorado SO_2 and NO_2 attainment areas); *id.* §81.307 ("Rest of State" designation for Connecticut PM_{10} unclassifiable area); *id.* §81.310 ("Rest of State" listing for Florida TSP and SO_2 and "Statewide" for NO_2 attainment areas); *id.* §81.311 ("Statewide" listing for Georgia NO_2 attainment area); *id.* §81.314 ("Rest of State" designation for Illinois PM_{10} unclassifiable area); *id.* §81.315 ("Rest of State" designation for Indiana PM_{10} unclassifiable area); *id.* §81.316 ("Remainder of State" designation for Iowa TSP and "Entire State" listing for SO_2

In most of the accompanying *Federal Register* notices, EPA has downplayed the significance of these redesignations, indicating only that the redesignation "will make it easier to track increment consumption"[139] or will result in a vaguely stated, noncontroversial benefit.[140] Such explanations conceal the profound consequences of resizing baseline areas through redesignation: baseline dates are untriggered, baseline concentration values are zeroed out, and increment consumption clocks are reset.

In Massachusetts, for example, single statewide attainment areas for SO_2 and NO_2 were each broken down through redesignation into 351 attainment areas—one for each city and town,[141] replacing single baseline concentration values and increment consumption clocks with 351 of each—many of which remain dormant. When EPA approved the redesignation request for NO_2, its published explanation was potentially misleading:

> The proposed action will redefine the boundaries of an attainment area. It does not affect the attainment status of any area, *nor does it increase the increment available in any area*. This proposed action will give the Commonwealth of Massachusetts the flexibility it desires in administering its PSD program.

and NO_2 attainment areas); *id.* §81.318 ("Statewide" designation for Kentucky NO_2 attainment area); *id.* §81.320 ("Rest of State" listing for Maine PM_{10} unclassifiable area); *id.* §81.321 ("Remainder of State" designation for Maryland SO_2 and "State of Maryland" listing for NO_2 attainment area); *id.* §81.323 ("Rest of State" designation for Michigan PM_{10} unclassifiable and "State of Michigan" listing for NO_2 attainment area); *id.* §81.325 ("Rest of State" listing for Mississippi NO_2 attainment area); *id.* §81.326 ("Remainder of State" listing for Missouri SO_2 and NO_2 attainment areas); *id.* §81.327 ("Rest of State" listing for Montana SO_2 attainment and PM_{10} unclassifiable areas and "Entire State" listing for NO_2 attainment area); *id.* §81.328 ("Entire State" listing for Nebraska SO_2 and NO_2 attainment areas); *id.* §81.330 ("Statewide" designation for New Hampshire NO_2 attainment area); *id.* §81.332 ("Rest of State" listing for New Mexico PM_{10} unclassifiable area); *id.* §81.336 ("Rest of State" listing for Ohio PM_{10} unclassifiable area and "State of Ohio" designation for NO_2 attainment area); *id.* §81.339 ("Rest of State" listing for Pennsylvania PM_{10} unclassifiable area and "Entire State" designation for NO_2 attainment area); *id.* §81.341 ("Statewide" listing for South Carolina NO_2 attainment area); *id.* §81.342 ("Entire State" listing for South Dakota SO_2 and NO_2 attainment areas and "Rest of State" designation for PM_{10} unclassifiable area); *id.* §81.343 ("Statewide" listing for Tennessee NO_2 unclassifiable area); *id.* §81.345 ("Rest of State" listing for Utah SO_2 attainment and PM_{10} unclassifiable areas and "Entire State" designation for NO_2 attainment area); *id.* §81.346 ("Remainder of State" designation for Vermont TSP attainment area and "Whole State" listing for PM_{10} unclassifiable area); *id.* §81.348 ("Rest of State" listing for Washington State PM_{10} unclassifiable area); *id.* §81.349 ("Remainder of State" designation for West Virginia TSP and SO_2 attainment areas, "Rest of State" listing for PM_{10} unclassifiable area, and "State of West Virginia" listing for NO_2 unclassifiable area); *id.* §81.350 ("State of Wisconsin" listing for NO_2 unclassifiable area); *id.* §81.351 ("Entire State" listing for Wyoming SO_2 and NO_2 attainment areas and "Rest of State" designation for PM_{10} unclassifiable area).

139. 46 Fed. Reg. at 27934. *See also* 46 Fed. Reg. at 53415; 48 Fed. Reg. at 46537; 51 Fed. Reg. at 887.

140. *See, e.g.,* 46 Fed. Reg. at 40190 (the redesignation from one Massachusetts statewide SO_2 attainment area to 351 individual cities and towns "will minimize the analysis of changes in ambient air levels of SO_2 resulting from construction of new sources"); 56 Fed. Reg. at 63465 (approving redesignation of a single Massachusetts NO_2 attainment area into 351 areas based on cities and towns "without prior proposal because the Agency views this as a noncontroversial amendment and anticipates no adverse comments"); 46 Fed. Reg. 32272, 32272 (June 22, 1981) (Virginia requested change to county-by-county designations "to provide more effective management of its air quality resources").

141. *See* 40 C.F.R. §81.322 (2004); 56 Fed. Reg. at 63464; 46 Fed. Reg. at 40190.

> EPA is approving this redesignation request without prior proposal because the Agency views this as a noncontroversial amendment and anticipates no adverse comments.[142]

The italicized portion of the foregoing quotation hides the ball a bit. EPA conceded in the same *Federal Register* notice that NO_2 minor source baselines for four towns had already been triggered, with the earliest trigger date being December 16, 1988.[143] Thus, a single NO_2 baseline date for the entire commonwealth of Massachusetts had already been established, and all NO_2 emissions since December 16, 1988, had been chewing up increment. When this single attainment area was busted with EPA approval into 351 areas, the redesignation event *did* effectively increase the NO_2 increment available for the 347 cities and towns[144] in which minor sources had been nibbling away at the increment from 1988 to 1991. The NO_2 emissions from such facilities—previously counted against the single, commonwealthwide increment—would thereafter be used to bump up the ceilings by inflating the baselines in each of their separate baseline areas. Stated another way, the *true* increment available in those 347 cities and towns has been increased as depicted in Figure 8 because air quality would now be permitted to deteriorate from the Figure 8, baseline #1, concentration value to the ceiling #2 value rather than to the ceiling #1 value that applied before the redesignation. In truth, as EPA noted in another context: "If a state can in its revised SIP define 'area' for purposes of baseline concentration as narrowly as a designated portion of an AQCR this might have the effect of establishing a later baseline date for some areas and *increasing the amount of increment available for growth*."[145]

One decade earlier, when EPA proposed to approve a similar redesignation of the single Massachusetts SO_2 attainment area into 351 areas, the Agency was only slightly more candid:

> [T]he baseline date for SO_2 has now been set for the entire state of Massachusetts by the PSD permit application filed by the Massachusetts Municipal Wholesale Electric Company located in Ludlow, Massachusetts, on August 4, 1978.[146] However, if each city and town were designated as a separate Section 107 attainment area, the baseline date would be set only in cities or towns in which is constructed a source or modification which is subject to PSD review and which emits significant amounts of sulfur dioxide (40 tons per year . . .), or in cities or towns on which such a source would have an impact greater than or equal to 1 μg/m3 on an annual basis.[147]

Federal Register notices accompanying baseline area redesignations consistently ignore the key issue of air quality deterioration. The following response to a public comment is typical:

142. 56 Fed. Reg. at 63465 (emphasis added).

143. *See id.* (noting that completed PSD permit applications for significant NO_2-emitting sources had been completed in the communities of Bellingham and Rochester on that date).

144. *See* 45 Fed. Reg. 82675, 82677 (Dec. 16, 1980) ("When these re-designations become effective the baseline date will be set in only a few cities and towns and, thus, sources located outside these towns . . . will not be required to comply with PSD increments.").

145. 44 Fed. Reg. at 51942 (emphasis added).

146. *See supra* note 64.

147. 46 Fed. Reg. 26355, 26355 (May 12, 1981).

> EPA proposed to redefine the SO_2 attainment area for Hamilton County into two distinct attainment areas. The purpose of the redefinition is to restrict the size of the area that is affected by a previously established baseline date . . . .
>
> Comment: Is the redefinition of Hamilton County attainment areas being done to avoid analysis of PSD increment consumption?
>
> Response: The redefinition of the Hamilton County attainment areas is appropriate and fully approvable. The redefinition of the areas obviated the need for PSD analysis and was authorized to more accurately reflect the true extent of the baseline area consistent with the current PSD regulations.[148]

Occasionally, EPA alludes to the heart of the matter, but even then, it tends to do so vaguely:

> Prior to this redefinition, the first permit application filed within the "Rest of State" could trigger a baseline air quality determination for the entire area. Listing attainment areas on a county-by-county basis [for Kentucky] in 40 C.F.R. 81.318 will allow baseline dates to be triggered separately for individual counties *and will therefore not restrict growth unnecessarily.*[149]

At times, commenters have complained that redesignations have been designed for the very purpose of allowing air quality degradation that would not be permissible absent redesignation. For example, when Nevada successfully sought to break a single attainment area (hydrographic area 61) into two such areas (an upper and lower basin 61), public commenters alleged:

> [T]he objective of the hydrographic area 61 redesignation, based on articles in the Nevada Press, appears to be to ensure that a new source in lower basin 61 (i.e., a proposed power plant) will not trigger the PSD minor source baseline date in upper basin 61 where there are mining operations. Thus, they claim, EPA's approval of the redesignation would help the mines circumvent PSD requirements and is inconsistent with the goals and intent of the PSD provisions of the Act.[150]

Commenters also complained "the action merely splits an area into two pieces so that the air pollution in the region can be doubled and EPA's PSD requirements can be avoided."[151]

EPA did not deny that the requested redesignation might degrade air quality. Indeed, the Agency conceded, "it is true that if one area is triggered before the other, then there could be additional minor growth in the baseline of the untriggered area relative to the newly triggered area, because the triggered area would then be constrained by the PSD increments."[152] Nevertheless, the Agency brushed off the resulting degradation in air quality:

> EPA's policy is to provide States with a fair degree of autonomy to balance air quality management with economic planning considerations. It is not necessary for EPA to make a finding that Nevada's redesignation request will improve air quality management by the State; rather, the Agency has to ensure that the request complies with the regulatory standards for section 107(d) redesignations and that the redesignation will not interfere with the State's management of air quality.[153]

J. Restrictions on Baseline Area Redesignations

Although the resizing of baseline areas through redesignation has been encouraged (and readily approved by EPA in at least 20 states), the Agency has imposed important restrictions on the mechanism. The regulations provide:

> [Baseline area] redesignations . . . cannot intersect or be smaller than the area of impact of any major stationary source or major modification which:
>
> (a) Establishes a minor source baseline date; or
> (b) Is subject to [the PSD permit requirement], and would be constructed in the same State as the State proposing the redesignation.[154]

Before turning to several illustrations of how these limitations operate, it is helpful to consider the Agency's explanation for the restrictions:

> Area redesignations are subject to certain restrictions. The boundaries of any area redesignated by a state cannot intersect the area of impact of any major stationary source or major modification that established or would have established a baseline date for the area proposed for redesignation or that is otherwise required to obtain a PSD permit. In addition, area redesignations can be no smaller than the area of impact of such sources. These restrictions comport with the PSD objective of tracking air quality effects in an area once a major source or modification has affected an area. By setting the baseline date at the time a major source or modification impacts an area and preventing the date from being changed by subsequent area redesignations, the system ensures that future growth in the area will be assessed for its air quality effects from that date forward. Moreover, if states could define baseline areas as small as the immediate area in which a source is located and not include the source impact area, air quality could deteriorate or increments could be violated in a nearby area impacted by the source, but neither the state nor EPA would review the air quality impact. The source could therefore affect air quality but the reviewing authority would be unaware of the deterioration. . . .
>
> Other than the limitations associated with processing 107 area redesignations as SIP revisions, EPA requires that area redesignations under section 107 cannot intersect or be smaller than the area of impact of any major stationary source or major modification which establishes a baseline date or is subject to PSD and would be constructed in the same state as the state proposing the redesignation. . . .
>
> This approach allows the flexibility requested by the commenters, but precludes "postage-stamp" designations designed to trigger baseline only in the immediate vicinity of the source. It also avoids the difficult area

148. 47 Fed. Reg. 20586, 20687 (May 13, 1982).

149. 54 Fed. Reg. 8322, 8323 (Feb. 28, 1989) (emphasis added).

150. 67 Fed. Reg. at 68773.

151. *Id.* at 68772.

152. *Id.* at 68773.

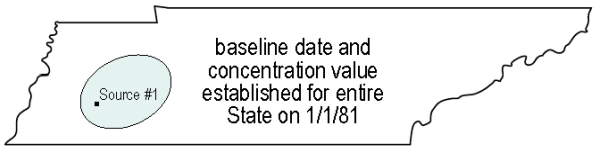
153. *Id.* For a discussion of how Nevada convinced EPA to retroactively interpret "Rest of State" to refer to more than 250 separate hydrographic areas, see *supra* note 111.

154. 40 C.F.R. §§51.166(b)(15)(ii), 52.21(b)(15)(ii).

boundary problems which would arise from defining area as the PSD source impact area.[155]

Let us now illustrate how these restrictions will operate (or fail to operate). Assume, first, that the entire state of Tennessee has been designated under Part 81 as a single SO_2 attainment area (as was true prior to 1984), and that the first and only PSD permit applicant thus far to emit more than de minimis quantities of SO_2 filed a completed permit application on January 1, 1981. We depict this facility as Source #1 in Figure 14. Even though its area of impact (the boundary of its 1 $\mu g/m^3$ SO_2 plume) might be very small in comparison to the state,[156] the filing of the complete permit application established a statewide minor source baseline date of January 1, 1981, for SO_2. From that point forward, newly added SO_2 emissions consume the PSD increment for that pollutant throughout the state.

Figure 14: Part 81 SO_2 Attainment Area Designation—Entire State

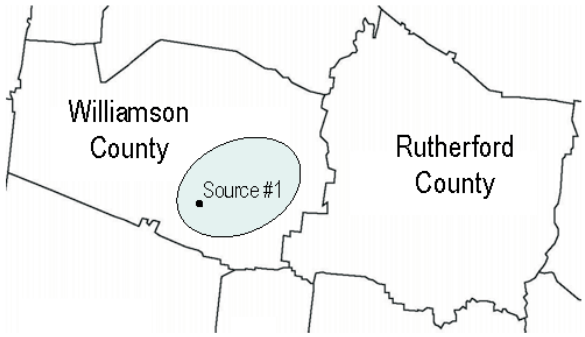


Next assume that Tennessee seeks a redesignation so that Part 81 will list each of Tennessee's 95 counties as a separate SO_2 attainment area. In this illustration, the scale of the drawing has been altered to focus on the county or counties affected by the Source #1 (baseline-setting) plume. If the 1 $\mu g/m^3$ SO_2 plume from Source #1 (the area of significant impact) falls within a single county (and if no other significant SO_2 emitting sources in the state have yet applied for a PSD permit), each of the 95 Tennessee counties will be redesignated as separate attainment areas. The one and only existing SO_2 baseline area (formerly the entire state) will shrink to embrace only the county affected by Source #1. The other 94 counties will have their baseline dates eliminated and their baseline values (and associated ceilings) zeroed out. This scenario is set forth in Figure 15.

155. 45 Fed. Reg. at 52716, 52726-27. *See also id*. at 52716 ("In addition to jeopardizing air quality, 'postage stamp' baseline areas would be difficult to administer.").

156. The size of the plume is exaggerated in Figure 14 to make it more readable.

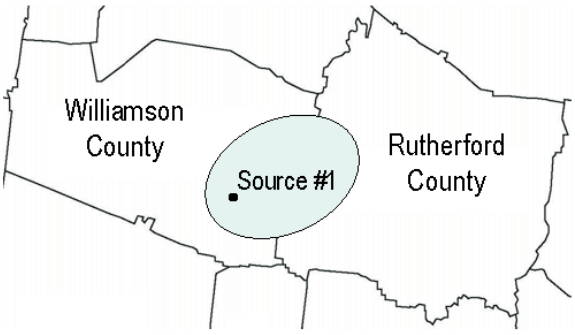
Figure 15: Redesignation of Attainment Areas to County-by-County



Because the significant impact plume of Source #1 does not extend beyond the Williamson County line, the baseline area established at the time of its completed PSD permit application is now recharacterized by the redesignation to have triggered the baseline date in Williamson County only. The limiting principles of EPA's baseline area redesignation rule[157] have not kicked in.

Now assume all of the information set forth in the previous example with one modification: the significant impact plume of Source #1 extends from the county in which the facility is located into an adjacent county. This is depicted in Figure 16.

Figure 16: Redesignation of Attainment Areas to County-by-County, Constrained by the First Baseline Area Redesignation Limitation



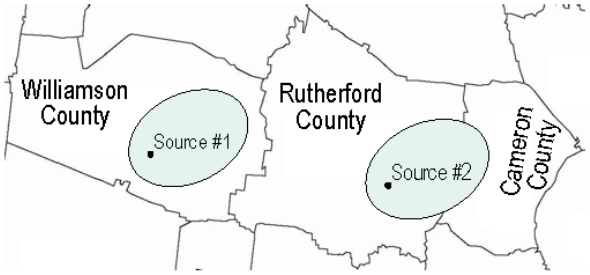
In this instance, the first of the two limiting principles of EPA's baseline area redesignation rule becomes operative,

157. 40 C.F.R. §§51.166(b)(15)(ii), 52.21(b)(15)(ii).

prohibiting the redesignation of Williamson County alone as a separate attainment area, and requiring instead that Rutherford County and Williamson County be classified together as a single attainment (and therefore, baseline) area. In the wording of the regulations, a baseline area established through the redesignation process "cannot intersect or be smaller than the area of impact of [the] major stationary source . . . which [established the] minor source baseline date."[158] Because Source #1 was the facility that established the (formerly statewide) baseline date, the redesignation cannot carve out separate baseline areas that would intersect its 1 $\mu g/m^3$ plume. Accordingly, the state's redesignation request will be granted, but the result will be 93 countywide attainment areas (with zeroed out baselines and baseline dates) and one two-county attainment area consisting of Rutherford and Williamson counties, for which the baseline date and baseline concentrations originally established by Source #1 persist. This illustration has been echoed in the real world on several occasions.[159]

The final—and most confusing—variation involves situations in which states seek redesignation after a single baseline date and a single baseline concentration have been established for a large attainment or unclassifiable area, and subsequent PSD permit applicants have located in that area without being required to establish the baseline. This possibility is shown in Figure 17. Because the baseline date is triggered—and the baseline concentration is established—only by the *first* completed PSD permit application in an area, subsequent PSD permittees in the same area do not trigger new baseline dates or establish new baseline concentrations.

Figure 17: Redesignation of Attainment Areas to County-by-County, Constrained by the Second Baseline Area Redesignation Limitation



In this instance, the first of the two limiting principles of EPA's baseline area redesignation rule has no operation—Williamson County alone can be designated as a separate attainment area, given the circumference of its plume, and Source #2 did not establish the (formerly statewide) baseline—but the second of the two limiting principles seems to kick in. Unfortunately, the wording of that limitation presents an interpretive challenge. The regulations say that a baseline area established through the redesignation process "cannot intersect or be smaller than the area of impact of any major stationary source . . . which [is] subject to [the PSD permit requirement], and would be constructed in the same state as the state proposing the redesignation.[160]

If this second limitation were not worded in a manner suggesting conditional futurity—"and would be constructed"—the limiting language would seem to apply to Source #2 and its plume in Figure 17.[161] If the language does apply, it would seem that the attainment areas created through the redesignation process could be county-by-county, except for Cameron and Rutherford counties, which must be designated as a single attainment area. This seems to make sense, given the similarity of the Source #2 plume in Figure 17 and the Source #1 plume in Figure 16. To be sure, we do not yet know the baseline *concentration* of the Cameron-Rutherford attainment area—even though the baseline date was presumably triggered when Source #2

158. *Id.* §§51.166(b)(15)(ii)(a), 52.21(b)(15)(ii)(a). To avoid confusion, we refer to this as the first baseline area redesignation limitation.

159. In 1983, EPA granted the request by Kansas that the "Entire State" SO_2 attainment area be redesignated on a county-by-county basis, but ruled that Pottawatomie and Nemaha counties must be combined into one SO_2 attainment area because the sole PSD source located in the former county had a significant impact on the latter. *See* 48 Fed. Reg. at 46783. *See also id*.

> Since a designated PSD "area" can be no smaller than the area of significant impact of a source, a permit application for a source which will have a significant impact on the air quality of more than one county will establish all of the significantly affected counties as a single attainment "area."

56 Fed. Reg. at 63465 (when Massachusetts redesignated each of its 351 cities and towns as separate attainment areas, EPA stated that if any preexisting PSD permit applicant had a significant impact in two or more towns, "those towns would have had to be part of the same attainment area").

On at least one occasion, EPA has spoken as if the limitation requires only that the portion of Rutherford County falling within the Source #2 plume must fall within the newly defined baseline area spanning Rutherford and Williamson counties in Figure 16: "[I]n cases where a major source's significant impact area extends into another county, the baseline date would also be triggered for that other county's *portion* of the significant impact area." 57 Fed. Reg. at 48462 (emphasis added). The italicized language may simply recognize that states have the freedom to redesignate baseline areas in chunks smaller than counties, and have occasionally done so. *See, e.g.*, 47 Fed. Reg. at 20587-88 (approving the redesignation of Hamilton County, Ohio, into two attainment areas). *See also supra* notes 135 & 140.

160. 40 C.F.R. §§51.166(b)(15)(ii)(b), 52.21(b)(15)(ii)(b). To avoid confusion, we refer to this as the second baseline area redesignation limitation.

161. An EPA paraphrase of the regulations suggests that the use of the conditional futurity term "would" is not meant to preclude application of the regulation's language to facilities built in the past:

> [T]he Federal PSD regulations . . . provide States with the option of establishing numerous PSD baseline areas . . . as long as the baseline areas do not intersect or are not smaller than the area of 1 $\mu g/m^3$ ambient impact of any major stationary source or major modification which established the minor source baseline date *or which was subject to PSD permitting requirements* (see 40 CFR 52.21(a)(15)).

60 Fed. Reg. at 47298 (emphasis added). The italicized portion of the foregoing language describes Source #2 in Figure 17. *See also* 45 Fed. Reg. at 52716 ("The boundaries of any area redesignated by a state cannot intersect the area of impact of any major stationary source or major modification *that established or would have established a baseline date for the area proposed for redesignation or that is otherwise required to obtain a PSD permit*.") (emphasis added).

completed its PSD permit application[162]—because there has not yet been any reason to compute it. But the conditional futurity structure of the language—"and would be constructed"—gets in the way of any interpretation involving the impact plume of an already completed facility.

To make matters even more confusing, the second limitation says that a baseline area established through redesignation "*cannot be . . . smaller than the area of impact* of any major stationary source . . . subject to [the PSD permit requirement] . . . [which] would be constructed in [the] state."[163] The italicized portion of this limitation is baffling. Is the EPA Administrator expected to use her imagination, conjuring up the largest possible 1 $\mu g/m^3$ plume that might emanate from a PSD permittee in the future (or that has emanated from such a permittee to date), compute the total square miles encompassed by such a hypothetical significant impact plume, and then rule that any county having a smaller number of square miles is prohibited from separate attainment (or unclassifiable) area designation? That approach would be so odd that it can scarcely have been intended.

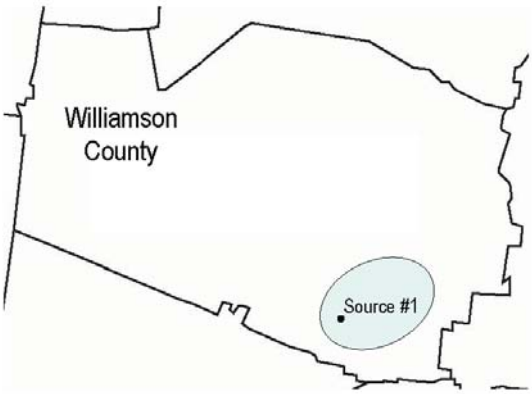
On at least one occasion, EPA has paraphrased the second limitation in a manner suggesting yet another interpretation: "[The] limits include a prohibition on the creation of new baseline areas if . . . the newly created areas either intersect the area of impact of any major PSD source or have a boundary that is smaller than such impact area."[164] The final clause in this description seems to say that no baseline in Figure 17, for example, can embrace less than the whole of the area denoted by the Source #1 or Source #2 plume.[165] Thus, Williams County (or Rutherford County) in Figure 17 might be subdivided into a bunch of separate attainment areas, as long as each of the newly created areas did not embrace any land located under either of the plumes, but the state could not subdivide any of the areas falling within the plumes themselves.[166]

K. The Ultimate Game: Continually Evolving "Area of Impact" Baseline Areas

A final way to interpret both limitations, acting together, would be to say simply that all areas in Figure 17 that do not fall within either the Source #1 plume or the Source #2 plume may be redesignated as one or more separate attainment areas. There is nothing in the statute or regulations requiring the use of counties as baseline area boundaries, and there are several instances in which EPA has approved redesignation requests for much smaller geographical units, breaking counties into one or more pieces,[167] busting the state up into hydrographic units[168] and further subdividing such units at will,[169] and breaking the commonwealth of Massachusetts into 351 separate units representing cities and towns.[170] Indeed, there have been occasions on which EPA has spoken as if the focus should be not on the plumes of PSD permit applicants, but on the areas *not* affected by such plumes. Thus, the Agency has paraphrased its own limitations to say: "As long as no PSD source has located in or has no significant annual impact on a clean area, that area can be redesignated as a new attainment area, even if that area was previously part of a larger clean area where the baseline date has been triggered."[171]

This alternative way of looking at the baseline area redesignation mechanism and its limitations suggests that states may engage in sequential redesignations designed to wall off from significant air quality degradation the smallest possible tracts of real estate.

Figure 18: Redesignating by Area of Impact—Step One



162. A *Federal Register* publication involving the redesignation of PM_{10} and SO_2 attainment areas in Nevada suggests that the untriggering of a single statewide baseline date will result in new, retroactively determined baseline dates for any newly carved out attainment or unclassifiable areas in which subsequent PSD permit applicants have submitted completed applications without establishing baseline values, such as Source #2 in Figure 17. EPA explained:

> For those areas in which a source or modification has submitted a complete PSD application or would have a significant impact, EPA approval would have the effect of establishing a new minor source baseline date for PM or SO_2 or both, i.e., from August 7, 1977 to various different (more recent) dates in the applicable areas. Examples include Las Vegas Valley (HA 212), which would have a new minor source baseline date for SO_2 of April 25, 1996 (triggered by a complete PSD application submitted by TIMET) and Black Mountains (HA 215), which would have a new minor source baseline date for PM of December 14, 1990 (triggered by a complete PSD application submitted by NCA #2).

69 Fed. Reg. 31056, 31061 (June 2, 2004). For a discussion about how to calculate the baseline concentration retroactively, see *Part II*, *supra* note 105, at text accompanying notes 76-78.

163. *Id*. (emphasis added).

164. 67 Fed. Reg. at 21196.

165. *See* 45 Fed. Reg. at 52716 ("area redesignations can be no smaller than the area of impact of . . . sources" required to obtain a PSD permit).

166. *See* 60 Fed. Reg. at 47298 (redesignation "is allowed . . . as long as the area to be excluded from the [new untriggered] attainment area encompasses the entire 1 $\mu g/m^3$ ambient impact of the . . . facility" which triggered the baseline date). Because—under this reading of the regulations—the area falling within the 1 $\mu g/m^3$ plume cannot be subdivided in the redesignation process, it follows that triggered baseline dates falling within such a plume cannot be untriggered in the redesignation process. *See* 58 Fed. Reg. 50275, 50276 (Sept. 27, 1993).

167. *See, e.g.*, 47 Fed. Reg. 20586 (May 13, 1982) (redesignating the Hamilton County, Ohio, SO_2 attainment area into two attainment areas).

168. *See, e.g.*, 67 Fed. Reg. 12474, 12475 (Mar. 19, 2002). *See also supra* note 111.

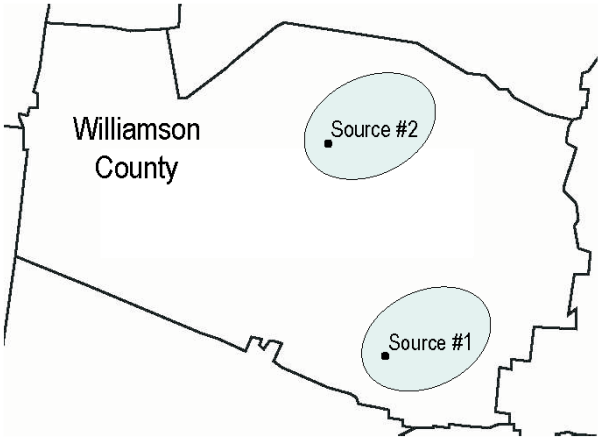
169. *See, e.g.*, 67 Fed. Reg. at 68773. *See also supra* note 150 and accompanying text.

170. *See* 46 Fed. Reg. at 40190 (SO_2); 56 Fed. Reg. at 63464 (NO_2).

171. 46 Fed. Reg. 55994, 55995-96 (Nov. 13, 1981). *See also* 45 Fed. Reg. at 52716.

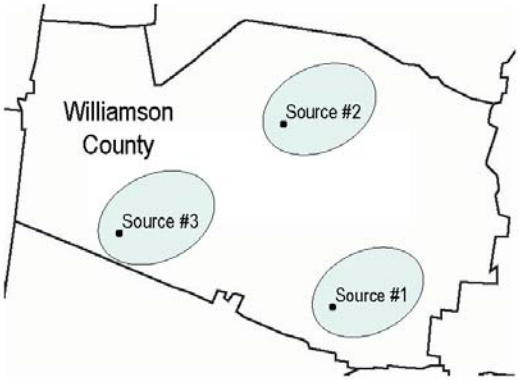
Imagine, for example, a single county, designated as a single PM_{10} attainment area, as depicted in Figure 18. Source #1 applies for a PSD permit, submitting computer modeling results depicting the outer bounds of its 1 $\mu g/m^3$ PM_{10} plume, also depicted in the figure. The state promptly submits a request to redesignate the county by busting it into two pieces: (1) the part embraced by the Source #1 plume; and (2) the part embracing all of the remaining portions of the county. The redesignation is approved.

Figure 19: Redesignating by Area of Impact—Step Two



Source #2 then applies for a PSD permit, with computer modeling demonstrating the outer bounds of its 1 $\mu g/m^3$ plume, as depicted in Figure 19. The state once more submits a request to redesignate the county by busting it into three pieces: (1) the part embraced by the Source #1 plume; (2) the part embraced by the Source #2 plume; and (3) the part embracing all of the remaining portions of the county. The redesignation is once more approved.

Figure 20: Redesignating by Area of Impact—Step Three



Source #3 then applies for a PSD permit, with computer modeling demonstrating the outer bounds of its 1 $\mu g/m^3$ plume, as depicted in Figure 20. The state yet again submits a request to further redesignate the county by busting it into four pieces: (1) the part embraced by the Source #1 plume; (2) the part embraced by the Source #2 plume; (3) the part embraced by the Source #3 plume; and (4) the part embracing all of the remaining portions of the county. The redesignation is approved yet again.

It is hard to imagine a redesignation process more carefully calculated to grant the least possible protection against the degradation of ambient air quality. Each time the portion of the county falling outside the then-existing plume(s) is redesignated as a separate attainment area, its baseline date is eliminated, its baseline concentration value is zeroed out, and subsequent minor source emissions are reallocated to drive up the not-yet-computed baseline value, simultaneously driving up the eventual ambient air concentration ceiling. This process may go on indefinitely.

EPA actually seems to invite this behavior when it says: "Where a baseline date is established for an area that is large relative to the impact area of the triggering source, the state has the option of redefining the area to reflect more accurately the area affected by the source."[172]

The strategic maneuvering steps depicted in Figures 18 through 20 may seem far-fetched. They are not. Very similar steps have been sequentially undertaken and approved by EPA for a portion of Wyoming known as the Powder River Basin. Prior to 1990, the entire state of Wyoming was treated as a single baseline area with a single, fixed baseline date of August 7, 1977.[173] In 1990, Wyoming requested redesignation of the Powder River Basin as a separate particulate attainment area, and EPA granted the request in 1991.[174] In 1992, Wyoming requested that the basin be redesignated as three separate particulate attainment areas, consisting of: (1) the area affected by the 1 $\mu g/m^3$ plume of Pacific Power & Light, which had submitted a complete PSD application; (2) the area affected by the 1 $\mu g/m^3$ plume of Hampshire Energy, which had also submitted a complete PSD application; and (3) all portions of the Powder River Basin falling outside the two plumes.[175] EPA granted the request.[176]

In 1994, Wyoming once more sought permission to slice and dice the Powder River Basin particulate attainment area (the portion of the Powder River Basin falling outside the Pacific Power & Light and Hampshire Energy baseline areas):

> [A] complete PSD permit application was received for the Kennecott/Puron facility in the [Powder River Basin], which would effectively trigger the minor source baseline date in the [Basin]. However, the State requested on December 19, 1994 that the impact area of this PSD source be designated as a separate section 107 area so that the minor source baseline date would only be triggered in the 1 $\mu g/m^3$ impact area of the Kennecott/Puron facility. Such a request is allowed under the Federal PSD rules as long as the area to be ex-

172. 45 Fed. Reg. at 52716.

173. *See* 58 Fed. Reg. at 4348.

174. *See id.*

175. *See id.* at 4349.

176. *See id.*

> cluded from the Powder River Basin particulate matter attainment area encompasses the entire 1 μg/m^3 ambient impact of the Kennecott/Puron facility. . . . EPA is approving the State's . . . request and is redesignating the Powder River Basin particulate matter attainment area to exclude the Kennecott/Puron PSD Baseline area, which is being designated as a separate particulate matter attainment area. Thus, EPA's action will "untrigger" the particulate matter minor source baseline date in the remaining Powder River Basin particulate matter attainment area.[177]

The state and EPA made no bones about the reason for the 1994 redesignation request, which was undertaken "to avoid triggering the particulate matter minor source baseline date for the entire Powder River Basin particulate matter attainment area."[178] Once again, EPA approved the redesignation.[179]

The Wyoming Powder River Basin saga is a classic illustration of the "fine print" of environmental law,[180] demonstrating what is undoubtedly a truism: if there is a loophole, someone will find it. Not surprisingly, the state's strategic maneuvering mirrors precisely the sequence of events depicted in Figures 18 through 20.

The use of continually evolving "area of impact" baseline area designations is the ultimate game in the manipulation of the baseline area definition to assure the maximum possible degradation of ambient air quality. As area of impact baselines are continually split off from attainment areas such as the Powder River Basin, all portions of the attainment area falling outside the 1 μg/m^3 plumes obtain the benefits of delay depicted in Figure 8.

L. Baseline Areas Created by Plumes Significantly Affecting More Than One Attainment or Unclassifiable Area

We have already noted that the *potential* baseline areas—the many attainment and unclassifiable areas set forth in Part 81—must not be confused with the sho 'nuff or real baseline areas that are created when the first PSD permit application in a potential baseline area is submitted.[181] Particularly as states slice and dice their attainment and unclassifiable areas into ever smaller potential baseline areas, the actual baseline areas established by PSD permit applications may span more than a single potential baseline area.

As shown in Figure 16,[182] the 1 μg/m^3 plume (area of significant impact) projected for the first PSD permit applicant in an area may spill over the boundaries of two or more attainment or unclassifiable areas. EPA's regulations declare that the baseline area created by such a permit application encompasses the complete boundaries of all such affected attainment or unclassifiable areas.[183] Thus, if Rutherford County and Williamson County in Figure 16 have been designated as distinct attainment areas (potential baseline areas), the Source #1 plume depicted in that illustration will have the effect of creating a single baseline area encompassing all of Rutherford and Williamson counties.[184]

M. Baseline Areas Resulting From Plumes Significantly Affecting Another State

As we have seen, baseline areas can ordinarily be no smaller than the 1 μg/m^3 plume boundary projected by the first PSD permit applicant in an attainment or unclassifiable area. Accordingly, the baseline area created by Source #1 in Figure 16 encompasses all of Rutherford and Williamson counties, and the baseline area redesignation shenanigans depicted in Figures 18 through 20 cannot result in areas smaller than the sequentially blossoming area-of-impact plumes.

There is, however, one conspicuous exception to this principle: baseline areas can never cross state lines. We refer to this as the "intrastate limitation." The regulations define "baseline area" by reference to "any *intrastate* area,"[185] and the wording was intentionally crafted to achieve the desired effect. As EPA has explained:

> If a major source significantly affects any clean air area in the same state the purposes of PSD will be served if air quality deterioration from minor/area source growth and actual changes in baseline source emissions are tracked from the time significant [increment pollutant] emissions from a new or modified major source impact a clean area. . . . The Administrator does not believe that such a policy should transcend state boundaries. Since triggering baseline dates is an important factor in managing growth, EPA has concluded that states should have jurisdiction over their own baseline dates.[186]

The consequences of the intrastate limitation are depicted in Figure 21. We assume that the source depicted in the diagram is the first PSD permit applicant in the area. The baseline area of the source can be no smaller than the portion of its 1 μg/m^3 plume falling within the state boundaries of Vermont; it may embrace a larger area of Vermont because the baseline area includes every portion of the attainment (or unclassifiable) areas in Vermont affected by its significant impact plume. If Vermont were designated as a single attainment area, for example, the baseline area created by this PSD application would be the entire state.

177. 60 Fed. Reg. 47290, 47291 (Sept. 12, 1995).

178. *Id.* at 47297, 47298.

179. *See id.* The Part 81 listings in which EPA has codified these continually evolving subdivisions of the Powder River Basin are depicted in Figure 13. For further analysis of the Power River Basin redesignations—and the consequences thereof—see *supra* note 135.

180. *See* Stensvaag, *supra* note 11, at 1094.

181. *See supra* notes 118-20 and accompanying text.

182. Figure 16 was used to depict the forbidden intersection of existing 1 μg/m^3 plumes when redesignating baseline areas.

183. *See* 40 C.F.R. §51.166(b)(15)(i); *id.* §52.21(b)(15)(i) (2005) ("any intrastate area (*and every part thereof*) designated as attainment or unclassifiable . . . in which" the permit applicant would have the 1 μg/m^3 air quality impact) (emphasis added).

184. *See* 48 Fed. Reg. at 46783 ("a permit application for a source which will have a significant impact on the air quality of more than one county will establish all of the significantly affected counties as a single attainment 'area'"); 56 Fed. Reg. at 63465 (where PSD permittees had significant impact plumes affecting two or more towns, those towns must be listed as part of the same attainment area).

185. *See* 40 C.F.R. §§51.166(b)(15)(i), 52.21(b)(15)(i) (emphasis added).

186. 45 Fed. Reg. at 52715-16. *See also id.* at 52681 ("Interstate impacts . . . do not trigger baseline date.").

Figure 21: Baseline Area—Intrastate Limitation

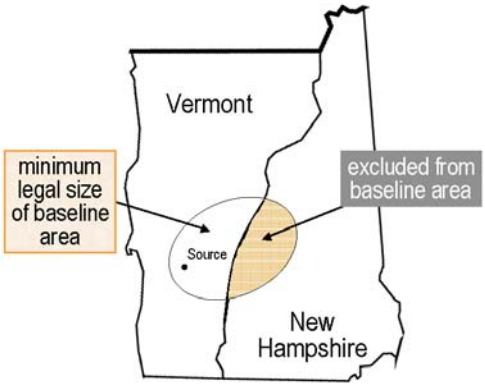
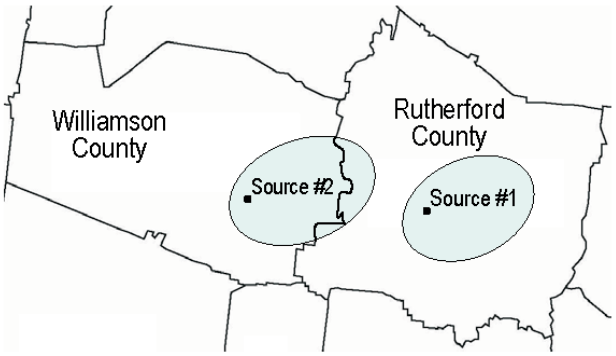


Figure 22: Significant Impact Plume Encroaching Preexisting Baseline Area



The intrastate limitation provides only that the baseline *area* defined by the Figure 21 source cannot extend into New Hampshire. The principle says nothing about the Vermont facility's obligation to comply with PSD or other air quality requirements in the adjacent state. In fact, several of the conditions for issuance of a PSD permit require consideration of how the emissions from the Vermont source will affect NAAQS and PSD increment compliance in New Hampshire.[187] The important thing for our present purposes is that the baseline area created by any PSD permit applicant can never cross state lines.

If the baseline date has never been triggered in the portion of New Hampshire affected by the Vermont facility's 1 $\mu g/m^3$ impact plume—if no baseline value has yet been established in that location—the emissions represented by the New Hampshire portion of the Figure 21 plume will push up the eventual New Hampshire baseline concentration value. By contrast, the portions of the plume falling within Vermont will count against the relevant PSD increment because the baseline date has been triggered for the affected portion of Vermont.

N. Newly Created Baseline Areas Cannot Encroach on Existing Baseline Areas

What happens when a facility is the first to apply for a PSD permit in a given attainment or unclassifiable area—the actor whose completed application triggers the baseline date—but the significant impact plume of the applicant will extend into an area in which the baseline date has already been triggered? The regulations do not expressly address this possibility, but the answer seems clear from the overall scheme of the PSD program. Figure 22 illustrates the situation.

If we assume that Rutherford and Williamson counties in Tennessee have been listed in Part 81 as separate PM_{10} attainment areas, the completed PSD permit application of Source #1 has triggered the baseline date in—and established a single baseline area for—all of Rutherford County. The baseline concentration value for that entire county has been established, and post-baseline date emissions of PM_{10} in Rutherford County (including those of Source #1) count against the PM_{10} increment. When Source #2 submits its completed PSD permit application, a separate baseline date for all of Williamson County is triggered, and a baseline concentration is established. Ordinarily, the baseline area established by Source #2 would also encompass all of Rutherford County because its 1 $\mu g/m^3$ impact plume extends into that attainment area. However, the baseline date has already been triggered for Rutherford County, and the baseline concentration for that area has already been established. Thus, the baseline area created by the completed permit application of Source #2 includes Williamson County and only Williamson County. It is true that increment consumption in Rutherford County by the Source #2 plume must be considered in reviewing the Source #2 permit application, but the baseline *area* created in the permit proceeding will not embrace all locations affected by that Source #2 plume.

O. The Pollutant-Specific Nature of Baseline Areas

As demonstrated earlier in this Article, baseline dates are pollutant-specific: they are triggered by the first PSD permit applicant in an area whose emissions of a given increment pollutant (PM_{10}, SO_2, or NO_2) exceed a significance threshold.[188] For the same reason, baseline areas—which are created only when baseline dates are triggered—are also pollutant-specific. Indeed, a "baseline area" (a term that can

187. *See* CAA §165(a)(3), 42 U.S.C. §7475(a)(3).

188. *See supra* notes 65-67 and accompanying text.

mean two quite different things)[189] is pollutant-specific in both senses of the term.

Potential baseline areas—the attainment and unclassifiable areas listed in Part 81—are designated on a pollutant-by-pollutant basis. Thus, for example, Cook County, Illinois, is nonattainment for PM_{10} but attainment or unclassifiable for NO_2[190]; similarly, Harmony Township, New Jersey, is nonattainment for SO_2 but attainment or unclassifiable for NO_2.[191] Moreover, a state may choose to designate the sizes of its attainment (or unclassifiable) areas in different ways for different pollutants; attainment areas for one pollutant may be listed on a county-by-county basis, while attainment areas for another pollutant may be listed on a different basis, such as AQCRs, hydrographic areas, area of impact, or the entire state. Pennsylvania, for example, lists SO_2 attainment areas primarily by reference to AQCRs, lists its sole PM_{10} attainment area by reference to Allegheny County, and lists a single NO_2 attainment area, denoted "Entire State."[192]

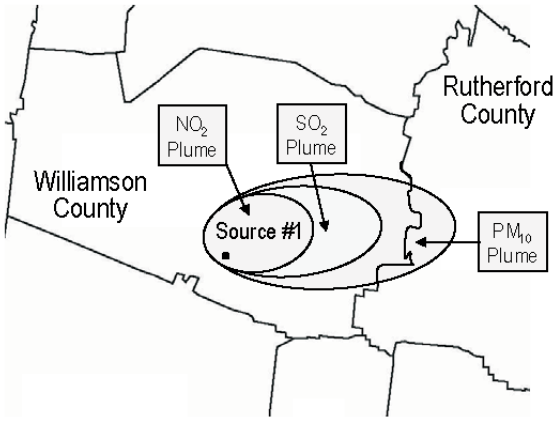
Actual baseline areas—the ones established by the first PSD permit in an area—are also pollutant specific. EPA explains:

> Section 107(d), which provides that areas designated attainment or unclassifiable are subject to PSD, requires designations to be made on a pollutant-specific basis. . . . To be consistent, both baseline date and baseline area (and any subsequent redesignations under section 107 of the Act) must also be pollutant-specific.[193]

The regulatory definition of baseline area emphasizes its pollutant-specific nature by referring to an area in which the PSD permit applicant "would construct or would have an air quality impact equal to or greater than 1 $\mu g/m^3$ . . . *of the pollutant for which the minor source baseline date is established*.[194]

To make things even more confusing, the 1 $\mu g/m^3$ plumes of a single PSD permit applicant who will emit significant quantities of several increment pollutants might encompass areas of considerably different size. The illustration in Figure 23 is designed to show the complexity that may be associated with the establishment of baseline areas from a single PSD permit applicant. To simplify things somewhat, we will assume that this first PSD permit applicant in Rutherford and Williamson counties (indeed, in all of Tennessee) will emit all three of the increment pollutants in significant amounts.

Figure 23: Pollutant-Specific Nature of Baseline Areas



Rutherford and Williamson counties are each listed in Part 81 as attainment areas for particulates and SO_2; Part 81 further denotes "Statewide" as a single NO_2 attainment or unclassifiable area in Tennessee.[195] Given the significant impact plumes depicted in Figure 23, the completed permit application of Source #1 will result in establishment of the following three baseline areas: (1) the Williamson County SO_2 baseline area; (2) the Williamson-Rutherford County single PM_{10} baseline area; and (3) the statewide Tennessee NO_2 baseline area. In many instances, of course, a PSD permit applicant happens to emit only one or two of the increment pollutants in sufficient quantities to trigger the associated baseline date, or happens to be the first PSD permit applicant for one or two increment pollutants but the second (or even later) permit applicant for a third increment pollutant. All of these variations may greatly complicate the creation and plotting of baseline areas.

P. State Variations on the Baseline Area Definition

One final baseline area complication is that states are free to approach the task of defining baseline areas in any manner they may wish, as long as they comply with the requirement that state variations be no less stringent than those that would be imposed by the federal program.[196] For example, EPA approved a 1982 Montana SIP revision establishing a statewide baseline area for SO_2 and an impact baseline area for TSP, finding such an approach to be consistent with Agency regulations "which allow States considerable discretion . . . provided the area established is no smaller than the impact area."[197]

States most frequently exercise the dealer's choice approach to defining "baseline area" by invoking the baseline area redesignation procedure examined earlier in this Article.[198] Numerous innovative approaches used by the states to slice and dice baseline areas are catalogued in the associated footnotes.

189. *See supra* notes 118-20 and accompanying text.

190. *See* 40 C.F.R. §81.314 (2004).

191. *See id.* §81.331.

192. *See id.* §81.339. *See also* 48 Fed. Reg. at 20232 (Montana SIP revision defining baseline areas as "statewide" for SO_2 and "impact area" for particulates).

193. 45 Fed. Reg. at 52717.

194. 40 C.F.R. §§51.166(b)(15)(i), 52.21(b)(15)(i) (2005) (emphasis added).

195. *See* 40 C.F.R. §81.343 (2004).

196. *See* CAA §116, 42 U.S.C. §7416.

197. 48 Fed. Reg. at 20232. *See also* 64 Fed. Reg. 48127, 48131 (Sept. 2, 1999) (noting Colorado's then-existing practice of defining a single statewide baseline area for SO_2 and separate AQCR-sized baseline areas for particulates).

198. *See supra* notes 123-80 and accompanying text. Technically, this is done by seeking redesignation of the attainment and unclassifiable area listings in Part 81.