

ARTICLES

# Preventing Significant Deterioration Under the Clean Air Act: The BACT Determination—Part I

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*Summary*

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PSD permits issued to major emitting facilities must include BACT standards for each pollutant subject to regulation under the CAA. These standards must be determined by permitting authorities on a case-by-case basis, subject to EPA review and approval. Step 1 of the EPA's preferred "top-down" procedure for making these determinations presents difficult interpretive issues, particularly as the Agency struggles to clarify its policy against using BACT to redefine the applicant's facility.

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This Article, published in two parts, is the sixth in a series examining implementation of the Clean Air Act's (CAA's)<sup>1</sup> prevention of significant deterioration (PSD) program and the second of two analyzing the best available control technology (BACT) element of that program.<sup>2</sup>

As we pointed out in our most recent Article, the BACT element of the PSD program has three components.<sup>3</sup> We have now examined the statutory and regulatory BACT requirement—the federal command that emissions of certain pollutants from certain stationary sources must comply with a specified standard.<sup>4</sup> We have also analyzed the statutory and regulatory BACT definition—the articulation of what that standard must be.<sup>5</sup> The final component for our consideration is the BACT determination: the process by which concrete emission limitations are developed and applied during the issuance of a PSD permit. Because BACT for any given facility and pollutant must be selected on a case-by-case basis, the BACT determination step is often far more important to PSD permit applicants (and their opponents) than any other component of the BACT element.

## I. BACT Determination Basics

In its 1990 Workshop Manual, the U.S. Environmental Protection Agency (EPA) explained the mandatory nature of the BACT determination:

The requirement to conduct a BACT analysis and determination is set forth in section 165(a)(4) of the Clean Air Act (Act), in federal regulations at 40 C.F.R. 52.21(j), in regulations setting forth the requirements for State imple-

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1. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.
  2. The first two Articles explored the intricacies of baselines, increments, and ceilings—the core features designed to assure that concentrations of certain air pollutants in clean areas of the country do not rise to the levels otherwise permitted by the national ambient air quality standards (NAAQS). See John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: Baselines, Increments, and Ceilings—Part I*, 35 ELR 10807, 10808 & nn.1-6 (Dec. 2005) (hereinafter *Baselines Part I*); John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: Baselines, Increments, and Ceilings—Part II*, 36 ELR 10017 (Jan. 2006) (hereinafter *Baselines Part II*). The third work examined the circumstances under which a new stationary source must obtain a prevention of significant deterioration (PSD) permit. See John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: New Facility Permit Triggers*, 38 ELR 10003 (Jan. 2008) (hereinafter *Permit Triggers*). The fourth Article addressed the area classification system. See John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: Area Classification, Initial Allocation, and Redesignation*, 41 ELR 10008 (Jan. 2011) (hereinafter *Area Classification*). The fifth Article—and the first of two analyzing the BACT element of the PSD program—explored the BACT requirement and the BACT definition. See John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: The BACT Requirement and BACT Definition*, 41 ELR 10902 (Oct. 2011) (hereinafter *BACT Requirement*).
  3. See *BACT Requirement*, *supra* note 2, at text accompanying notes 22-24.
  4. *Id.* at text accompanying notes 25-123.
  5. *Id.* at text accompanying notes 125-89.

mentation plan approval of a State PSD program at 40 C.F.R. 51.166(j), and in the SIPs of the various States at 40 C.F.R. Part 52, Subpart A–Subpart FFF.<sup>6</sup>

### A. *The Decisionmaking Role of the “Reviewing Authority”*

The statutory BACT definition says that BACT is “an emission limitation based on the maximum degree of reduction of each pollutant . . . which the permitting authority, on a case-by-case basis . . . determines is achievable . . . .”<sup>7</sup> The regulations replace the term “permitting authority” with the phrase “reviewing authority.” The regulations then go on to define “reviewing authority” as:

the State air pollution control agency, local agency, other State agency, Indian tribe, or other agency authorized by the Administrator to carry out a permit program under §51.165 and this section [51.166], or the Administrator in the case of EPA-implemented permit programs under §52.21 of this chapter.<sup>8</sup>

Thus, it is the PSD permitting entity—the reviewing authority—that will establish the BACT standard for each of the covered pollutants emitted by a major emitting facility. As with all other aspects of the PSD permit, the reviewing authority’s selection of BACT is subject to EPA review and potential disapproval.<sup>9</sup>

### B. *The Mandatory Opportunity for a Public Hearing*

Section 165(a) provides:

No major emitting facility . . . may be constructed in any area to which this part applies unless . . .

- (2) the proposed permit has been subject to a review in accordance with this section . . . and a public hearing has been held with opportunity for interested persons including representatives of the Administrator to appear and submit written or oral presentations on . . . control technology requirements, and other appropriate considerations . . . .<sup>10</sup>

This statutory language seems to suggest that a public hearing will be held on each and every PSD permit application.

The regulations do not, however, mandate a public hearing in every case. Instead, they provide for an opportunity

for such a hearing. For jurisdictions in which a state or Tribe is the reviewing authority, the regulations declare that each applicable state implementation plan (SIP) or tribal implementation plan (TIP) “shall provide” that:

- (2) Within one year after receipt of a complete application, the reviewing authority shall: . . . .
  - (iii) Notify the public . . . of the . . . opportunity for comment at a public hearing as well as written public comment. . . .
  - (v) Provide opportunity for a public hearing for interested persons to appear and submit written or oral comments on the air quality impact of the source, alternatives to it, the control technology required, and other appropriate considerations.<sup>11</sup>

For jurisdictions in which EPA is the reviewing authority, the regulations provide that the Administrator must follow the procedures of 40 C.F.R. Part 124 in processing any PSD permit application.<sup>12</sup>

These statutory and regulatory provisions mean that the BACT determination will often be made by the reviewing authority in the context of a public hearing—an arena in which the major emitting facility and any opponents of the project will be given the opportunity to argue for and against their preferred BACT standards.

### C. *The Controversial and Uncertain Nature of the BACT Determination Process*

EPA describes the BACT determination process as follows:

Typically, the [proposed major emitting facility] conducts a BACT analysis to be submitted with the permit application to the permitting authority. . . . The permitting authority reviews the applicant’s analysis and, after taking into account the energy, environmental, and economic impacts and other costs, and the public’s views, specifies an emissions limitation for the source that, in the permitting authority’s reasoned judgment, reflects BACT.<sup>13</sup>

This sounds simple enough, but the reality is more complicated.

Picture a decisionmaking process involving many dozens of reviewing authorities across the nation, through which each decisionmaker is commanded to come up with an emission limitation reflecting the “maximum degree of reduction . . . achievable” through the application of various approaches (“production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques”), taking into account multiple factors (“energy, environmental, and economic impacts and other

6. U.S. EPA, New Source Review Workshop Manual at B.1 (Oct. 1990), *available at* <http://www.epa.gov/ttn/nstr/gen/wkshpman.pdf> [hereinafter 1990 Workshop Manual]. *See also* 45 Fed. Reg. 52676 (Aug. 7, 1980) (“Any major stationary source . . . subject to PSD must conduct an analysis to ensure application of” BACT).

7. CAA §169(3), 42 U.S.C. §7479(3).

8. 40 C.F.R. §51.166(b)(50). *See also* 40 C.F.R. §52.21(b)(51). For an explanation of the two sets of PSD regulations, *see BACT Requirement, supra* note 2, at n.28.

9. *See Alaska Dept. of Environmental Conservation v. U.S. Environmental Protection Agency (EPA)*, 540 U.S. 461, 34 ELR 20012 (2004) (affirming EPA disapproval of state BACT determination).

10. CAA §165(a)(2); 42 U.S.C. §7465(a)(2).

11. 40 C.F.R. §51.166(q).

12. *See* 40 C.F.R. §52.21(q). *See also* 40 C.F.R. §124.1 (“This part contains EPA procedures for issuing, modifying, revoking and reissuing, or terminating all . . . PSD . . . ‘permits.’”).

13. 61 Fed. Reg. 38250, 38271 (July 23, 1996).

costs”). Imagine further that participants in this decision-making process may include at least one actor (the permit applicant) wishing to make those emission limitations as lenient as possible and other actors (environmental groups and other intervenors) seeking to make the limitations as stringent as possible. Imagine, as well, that each proposed major emitting facility being subjected to this decision-making process faces unique conditions with respect to its financial capabilities and the availability, nature, and location of its raw materials and markets, and is to be located in an area having unique air quality and airshed characteristics. Finally, assume that opponents of the facility would like to do everything in their power to delay or preclude the construction and operation of the facility.<sup>14</sup>

The foregoing description is not unusual. A moment’s reflection will show that the task faced by the reviewing authority is a challenging one. Moreover, it is hard to imagine a more suitable Petri dish for controversy than the BACT determination process. EPA has observed:

The deliberative nature of BACT . . . determinations has spawned considerable controversy. Issues have included (1) the scope and comprehensiveness of the universe of candidate technologies which must be considered, (2) when the universe of control technology candidate technologies may be closed to the introduction of new technologies relative to a given permit application,<sup>15</sup> and (3) the methodology for analyzing the candidate technologies for BACT.<sup>16</sup>

The BACT determination process is not only difficult and controversial. The case-by-case nature of the exercise is also likely to lead to inconsistent BACT standards governing emissions of a single pollutant from similar types of facilities.<sup>17</sup>

#### D. The BACT Clearinghouse and BACT Guidance Documents

The U.S. Congress and EPA have sought to make BACT determinations more manageable, more predictable, and

more consistent, in a number of ways. First, Congress has commanded:

The Administrator shall make information regarding emission control technology available to the States and to the general public through a central database. Such information shall include all control technology information received pursuant to State plan provisions requiring permits for sources, including operating permits for existing sources.<sup>18</sup>

Pursuant to this directive, EPA has established<sup>19</sup> and made available on the web<sup>20</sup> the RACT/BACT/LAER Clearinghouse (RBLC)—a searchable database containing over 5,000 determinations identifying technologies to mitigate most air pollutant emission streams.<sup>21</sup>

Perhaps the most powerful way to search the Clearinghouse for purposes of the BACT determination process is the “Find the Lowest Emission Rate Search,” which “provides a rank order listing (most stringent to least stringent emission rate) for the process and pollutant” selected.<sup>22</sup>

A second way in which EPA has tried to make BACT determinations more manageable, predictable, and consistent is by issuing memoranda setting forth guidelines,<sup>23</sup> PSD workshop manuals,<sup>24</sup> and other guidance docu-

14. See, e.g., Gary McCutchen & Colin Campbell, *Retroactive Application of NSR Policy*, 19 No. 6 AIR POLLUTION CONSULTANT 5.1 (2009), at 5.2 (“Challenges to air permits have increased dramatically in the last decade, especially for coal-fired power plants, which have been specifically targeted by the Sierra Club and other environmental groups”); *id.* (“the time that elapses between the submittal of a permit application and the issuance of a permit averages one year, and can take five years or more”).

15. For a discussion of the timing of the BACT determination cutoff date, see John-Mark Stensvaag, *Preventing Significant Deterioration Under the Clean Air Act: The BACT Determination—Part II*, 42 ELR\_\_ (forthcoming 2012) [hereinafter *BACT Determination Part II*].

16. 61 Fed. Reg. 38250, 38271 (July 23, 1996).

17. See, e.g., Steven J. Klafka et al., *Air Quality Permit Issuance and Varying Interpretations of BACT in the Flat Glass Industry*, Paper #458, presented at the Annual Meeting of the Air & Waste Management Association, 10 Table 5 (June 2001), available at <http://www.wingraengineering.com/FlatGlassBACTbySKlafka,June2001.pdf> (showing BACT CO emission limitations for essentially identical flat glass manufacturing facilities ranging from no limits at Iowa and Kentucky facilities, to 0.75 pounds per ton at a New York facility). The determination that a “no control” standard for CO at the Iowa and Kentucky facilities complies with the BACT requirement poses an intriguing question: can BACT ever consist of no controls at all?

18. CAA §108(h), 42 U.S.C. §7408(h) (entitled RACT/ BACT/LAER clearinghouse). For an illustration of how EPA uses the Clearinghouse in the BACT determination process, see *In re Masonite Corp.*, PSD Appeal No. 94-1, 1994 WL 615380, 5 E.A.D. 551, 1994 EPA App. LEXIS 36 (EAB Nov. 1, 1994), at slip op. 26-27.

19. The Agency announced establishment of a BACT Clearinghouse in 1978, see 43 Fed. Reg. 26388, 26397 (June 19, 1978), despite the fear of one commenter that “the clearinghouse idea would lead to EPA collecting control information from various sources and imposing the most stringent measure that one particular source might meet across the board.” 45 Fed. Reg. 85400, 85402 (Dec. 24, 1980). The 1990 CAA Amendments codified its existence by establishing a new §108(h), and made several minor changes to it. See U.S. EPA Office of Air Quality Planning and Standards, *RACT/ BACT/LAER Clearinghouse Annual Report for 1998* at 1 (June 1998).

20. See <http://www.epa.gov/ttn/catc/rblc/html/>. An alternative gateway to the database is <http://cfpub.epa.gov/RBLC/>.

21. The clearinghouse “includes data submitted by several U.S. territories and all 50 States on over 200 different air pollutants and 1,000 industrial processes.” See [http://www.epa.gov/ttn/catc/rblc/html/welcome\\_eg.html](http://www.epa.gov/ttn/catc/rblc/html/welcome_eg.html) (last visited Oct. 5, 2011). In 2001, EPA concluded that “[p]ermitting agency staff represent about one-third of those using the RBLC, with the remaining two-thirds of users representing “industry, consultants and lawyers preparing NSR permit applications or searching for good technology options for their air pollution abatement problems.” 66 Fed. Reg. 24371 (May 14, 2001).

22. See [http://www.epa.gov/ttn/catc/rblc/html/welcome\\_eg.html](http://www.epa.gov/ttn/catc/rblc/html/welcome_eg.html) (last visited Oct. 5, 2011). “The search is currently limited to combustion sources but will be expanded in the future.” *Id.*

23. See, e.g., 1978 Guidelines for Determining Best Available Control Technology (BACT), transmitted by Memorandum from David G. Hawkins, to Regional Administrators (Jan. 4, 1979); Memorandum of Gary McCutchen, to Bruce Miller re Huntsville Incinerator-Determining Best Available Control Technology (Apr. 22, 1987); Background Statement on the EPA’s Top-Down Policy (June 13, 1989), transmitted by Memorandum of John Calcagni (June 13, 1989). But see Rolf R. von Oppenfeld et al., *A Primer on New Source Review and Strategies for Success*, 32 ELR 11091, 11092 (Sept. 2002) (the 1978 guidelines “have been superseded and now the standard reference is found in” the 1990 Workshop Manual).

24. See U.S. EPA Office of Air, Noise, and Radiation, *Prevention of Significant Deterioration Workshop Manual* (Oct. 1980) (hereinafter 1980 Workshop Manual); 1990 Workshop Manual, *supra* note 6. The 1990 document is sometimes referred to as the “NSR Manual.” See, e.g., *In re Steel Dynamics PSD Permit No. CP-183-10097-00030*, PSD Appeal Nos. 99-4 & 99-5,

ments.<sup>25</sup> State and local agencies have also published guidance documents.<sup>26</sup>

From the point of view of PSD permit applicants, the problem with these various guidelines and guidance documents is that the Agency has insisted that the documents are not binding but has repeatedly suggested that deviations from the documents will be viewed with suspicion.<sup>27</sup> Thus, for example, the EPA Environmental Appeals Board (EAB) said in a 2002 proceeding:

The . . . NSR [New Source Review/1990 Workshop] Manual is not accorded the same weight as a binding Agency regulation and, as such, a strict application of the methodology described in the NSR manual is not mandatory. Nevertheless, in evaluating the rationality and defensibility of BACT determinations by permitting authorities, the Board has required an analysis that reflects a level of detail in the BACT analysis comparable to the methodology in the NSR Manual.<sup>28</sup>

This approach is no doubt maddening to PSD permit applicants and to state agencies whose BACT determinations are challenged by EPA.

## II. EPA's Initial Approach: The Bottom-Up Method

During the first years of PSD implementation, the burden of disputing the permit applicant's choice of BACT was

effectively placed on the reviewing authority.<sup>29</sup> The applicant would first select the technology representing BACT, and the reviewing authority would then either accept that technology or undertake the task of demonstrating that a technology yielding greater emission reductions must be selected instead. This BACT determination method was formally sanctioned by EPA in guidelines disseminated in December 1978<sup>30</sup> and in a workshop manual published in October 1980.<sup>31</sup> As the Agency later explained:

Those documents described a so-called "bottom-up" approach to BACT determinations. The applicant was to propose a base case as BACT, present more stringent control alternatives, and defend its BACT selection by "demonstrating that each alternative control system . . . would cause unreasonable adverse energy, environmental, or economic impacts."<sup>32</sup>

The 1980 Workshop Manual fleshed out how the bottom-up approach was to be conducted:

In order to rank the alternative control strategies and to consider them quantitatively, a base case should be established. The base case is the control strategy that, in the absence of BACT decisionmaking, would normally have been applied. . . . With the creation and analysis of a base case, alternative control strategies affording greater degrees of continuous emission reduction than the base case can now be ranked in order of control efficiency and should be analyzed for BACT.<sup>33</sup>

Although this process apparently ran smoothly, an EPA task force established during President Ronald Reagan's Administration expressed concerns about the appropriateness of the bottom-up approach to fulfilling the Agency's statutory obligations:

One of the task force's findings, based upon a comprehensive review of numerous PSD permits issued during the previous several years, was that PSD applicants and States frequently were conducting inadequate BACT determinations using the "bottom-up" approach of the 1978

2000 WL 833062, 9 E.A.D. 165, 2000 EPA App. LEXIS 18 (EAB June 22, 2000), at slip op. 43; In re Knauf Fiber Glass PSD Permit No. 97-PO-06, PSD Appeal Nos. 98-3 through 98-20, 1999 WL 64235, 8 E.A.D. 121, 1999 EPA App. LEXIS 2 (EAB Feb. 4, 1999), at slip op. 19-20. To avoid confusion, we will use its more common designation as the 1990 Workshop Manual.

25. See U.S. EPA Office of Air and Radiation, PSD and Title V Permitting Guidance for Greenhouse Gases (Mar. 2011) [hereinafter Permitting Guidance for Greenhouse Gases]. In a 1996 *Federal Register* notice, EPA stated that it was "preparing a case study report, containing examples of BACT determinations properly employing the EPA methodology." See 61 Fed. Reg. 38250, 38274 (July 23, 1996). We have been unable to locate such a study.

26. See, e.g., Bay Area Air Quality Management District, Best Available Control Technology (BACT) Guidelines, <http://hank.baaqmd.gov/pmt/bactworkbook/> (last visited Feb. 8, 2011); 2006 South Coast Air Quality Management District BACT Guidelines.

27. The 1990 Workshop (or NSR) Manual does not have the force of a formal rule. See *Chipperfield v. Missouri Air Conservation Comm'n*, 229 S.W.3d 226, 242 (Mo. App. 2007) ("[a]ppellants have not directed our attention to any authority, and we can find none, indicating that the comments contained in the [1990 Workshop] Manual are binding or controlling upon the [state agency], the Commission, or the courts of this State"). Nevertheless, the EPA Environmental Appeals Board (EAB) tends to give it great weight. See, e.g., In re Steel Dynamics PSD Permit No. CP-183-10097-00030, PSD Appeal Nos. 99-4 & 99-5, 2000 WL 833062, 9 E.A.D. 165, 2000 EPA App. LEXIS 18 (EAB June 22, 2000), at slip op. 44 n.22 ("[w]hile the [1990 Workshop] Manual is not a binding rule and is not accorded the same weight as an EPA regulation, it is considered by this Board to be a statement of the Agency's thinking on certain PSD issues"). See also In re Knauf Fiber Glass PSD Permit No. 97-PO-06, PSD Appeal Nos. 98-3 through 98-20, 1999 WL 64235, 8 E.A.D. 121, 1999 EPA App. LEXIS 2 (EAB Feb. 4, 1999), at slip op. 21 n.14 ("[w]e would not reject a BACT determination simply because the permitting authority deviated from the [1990 Workshop] Manual, but we would scrutinize such a determination carefully to ensure that all regulatory criteria were considered and applied appropriately").

28. In re General Motors, PSD Appeal No. 01-30, 10 E.A.D. 360, 2002 WL 373982, 2002 EPA App. LEXIS 2 (EAB Mar. 6, 2002), at slip op. 14-15.

29. See Amy R. Coy & Eric A. Groten, *New Growth in the PSD Forest: A Trial Map*, 4 NAT. RESOURCES & ENV'T 33, 58 (Spring 1989) ("the EPA then had the burden of showing that the controls selected by the permit applicant were not BACT and that more stringent controls were achievable and economically feasible").

30. See 1978 Guidelines, *supra* note 23, at 5-6; Background Statement, *supra* note 23, at 2.

31. See 1980 Workshop Manual, *supra* note 24, at I-B-7; Background Statement, *supra* note 23, at 2.

32. Background Statement, *supra* note 23, at 2, quoting 1978 Guidelines, *supra* note 23, at 5-6.

33. 1980 Workshop Manual, *supra* note 24, at I-B-7. Under the bottom-up approach, no exploration of alternatives was required if the permit applicant proposed, as the base case, technology providing the highest degree of emission reduction available. See *id.* In other words:

The applicant need not evaluate control alternatives that would result in greater emissions than those proposed as BACT. For example, in a sanding operation, the control options would be a cyclone collector, a baghouse, and an electrostatic precipitator. If the applicant had proposed a baghouse as BACT, a detailed analysis of the cyclone would generally be unnecessary.

*Id.* at II-B-2.

Guidelines and the 1980 workshop manual. In numerous instances, applicants would propose an emission limitation at or near an applicable . . . NSPS [new source performance standard] under section 111 of the CAA<sup>34</sup> as the base case, and provide little or no consideration of the more stringent control options before settling on the proposed level as BACT. It also appeared that States typically would accept these determinations with little or no independent analysis, thereby possibly failing to fulfill their responsibilities under the Act. The task force pointed out two basic solutions to the problem of inadequate BACT analyses. One was to focus on improving implementation of the bottom-up approach so that in practice as well as in theory, the statutory requirements would be observed. The other option was to call for a top-down approach to the BACT analysis in the expectation that its internal dynamics would, in practice, achieve more effective implementation of the BACT requirements.<sup>35</sup>

Shortly after issuance of the task force report, EPA Administrator Lee Thomas declared in the *Honolulu Resource Recovery Facility* adjudicative ruling that a PSD applicant has the “burden of demonstrating that significant technical defects, or substantial local economic, energy, or environmental factors or other costs warrant a control technology less efficient than [the most stringent technology available].”<sup>36</sup> Within days of that ruling, the Agency issued guidance calling for the application of this principle to all BACT determinations involving municipal waste combustion facilities—the type of facility involved in the *Honolulu Resource Recovery Facility* case.<sup>37</sup>

### III. EPA’s Adoption of the Top-Down Method

In late 1987, Assistant Administrator J. Craig Potter issued a memorandum (the Potter Memorandum) committing EPA to a “top-down” process for determining BACT for all categories of PSD sources.<sup>38</sup> As later explained by the Agency:

[T]he top-down process requires that all available control technologies are ranked in descending order of effectiveness. The PSD applicant first examines the most stringent—or “top”—alternative. That alternative is established as BACT unless the applicant can demonstrate, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not “achievable” in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.<sup>39</sup>

By 1990, EPA had formalized the top-down approach into a five-step procedure<sup>40</sup> that has subsequently been implemented in countless BACT determinations.

The top-down approach reflects “a strong bias in favor of applying the most stringent control technology available unless the applicant can demonstrate ‘unique’ and ‘substantial’ environmental or cost impacts.”<sup>41</sup> It “shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available.”<sup>42</sup>

#### A. Challenges to the Top-Down Method

Industry representatives were not happy with EPA’s shift from the bottom-up to the top-down approach, and challenged the latter policy in court.<sup>43</sup> Among other things, the

34. For a discussion of how BACT should relate to the NSPS, see *BACT Requirement*, *supra* note 2, at text accompanying notes 138–46.

35. Background Statement, *supra* note 23, at 2–3, citing to “New Source Review Task Force Report,” Final Draft (Dec. 1986), at 25–28. EPA Administrator William K. Reilly further explained the defects in the bottom-up approach in a 1989 adjudicative decision:

[T]he permit applicant could select virtually whatever technology it deemed desirable from a business or utilitarian perspective—the so-called “baseline case”—and then, in a formidable challenge to the applicant’s powers of objectivity, the applicant was expected to present a full and fair analysis of alternative technologies, including potentially more effective technologies. This approach presented too many opportunities for abuse, since it provided little or no incentive for the applicant to select the most effective technology, particularly when the most effective technology—as is often the case—was also the most expensive technology.

In the Matter of Spokane Regional Waste-to-Energy, PSD Appeal No. 88-12, 1989 WL 266360, 2 E.A.D. 809, 1989 EPA App. LEXIS 23 (EPA Admr. June 9, 1989), at slip op. 9 n.13.

36. In the Matter of Honolulu Resource Recovery Facility, PSD Appeal No. 86-8, 1987 WL 120704, 2 E.A.D. 375, 1987 EPA App. LEXIS 17 (EPA Admr. June 22, 1987), at slip op. 8. The most stringent technology then available for the proposed municipal waste combustor facility was dry scrubbing—a technology selected by 17 of 21 municipal waste burners in EPA Region IX. See *id.* slip op. 6. See also Michael L. Wilson et al., *A Critical Review of the Environmental Protection Agency’s Standards for “Best Available Control Technology” Under the Clean Air Act*, 20 ELR 10067, 10070 (Feb. 1990) (the *Honolulu Resource Recovery* decision “imposed a significantly greater burden on the applicant by mandating that the applicant choose the most stringent control technology unless it could demonstrate that unique local factors justified a less efficient control technology”).

37. See Background Statement, *supra* note 23, at 2–3, citing to “Operational Guidance on Control Technology for New and Modified Municipal Waste Combustors” (June 26, 1987).

38. See Improving New Source Review (NSR) Implementation, Memorandum from J. C. Potter, Assistant EPA Administrator for Air & Radiation, to Regional Administrators, Regions I–X, at 3 (Dec. 1, 1987), available at [http://www.epa.gov/NSR/ttnsr01/psd2/p8\\_23.html](http://www.epa.gov/NSR/ttnsr01/psd2/p8_23.html) (last visited Oct. 17, 2011). See also Background Statement, *supra* note 23, at 1.

39. Background Statement, *supra* note 23, at 1, citing Potter Memorandum, *supra* note 38.

40. See 1990 Workshop Manual, *supra* note 6, at B.4–B.54. We examine this five-step process in *infra* text accompanying notes 66–142, and in *BACT Determination Part II*, *supra* note 15.

41. Wilson et al., *supra* note 36, at 10069. See, e.g., In the Matter of Honolulu Resource Recovery Facility, PSD Appeal No. 86-8, 1987 WL 120704, 2 E.A.D. 375, 1987 EPA App. LEXIS 17 (EPA Admr. June 22, 1987), at slip op. 6 n.9 (because most resource recovery facilities in region would use scrubbers, “substantial and unique local factors must be shown to justify a less efficient control technology”).

42. Potter Memorandum, *supra* note 38, at 4. The top-down approach differs from the bottom-up approach “in that it requires the applicant to analyze a control technology only if the applicant opposes that level of control.” *Id.*

43. See *American Paper Institute (API) v. EPA*, No. 89-1428 (D.C. Cir. July 10, 1989). A consortium of utilities filed a similar petition for review of EPA’s actions, in *Alabama Power Co. v. EPA*, No. 89-1429 (D.C. Cir. July 11, 1989), and the case was consolidated with the pending *API* case in the D.C. Circuit. The API subsequently challenged the 1990 Workshop Manual. See *API v. Reilly*, No. 90-1364 (D.C. Cir. July 13, 1990). See also 58 Fed. Reg. 10957, 10960-62 (Feb. 23, 1993) (discussing industry’s objection to EPA approval of the Connecticut SIP, which arguably included a letter in which Connecticut stated its intention to continue using top-down methodology); 57 Fed. Reg. 28093, 28095 (June 24, 1992) (noting industry objections to a similar letter from the Texas Air Control Board and concluding “EPA agrees

petitioners asserted that the top-down policy represented such a radical departure from the bottom-up approach of the 1978 Guidelines and the 1980 Workshop Manual that the new policy should be subject to notice-and-comment rulemaking.<sup>44</sup> They further asserted that the top-down policy illegally equated BACT with LAER.<sup>45</sup>

These challenges were resolved by a settlement agreement in which EPA agreed to publish, by January 6, 1992, a proposed rule “to revise or clarify the regulations defining BACT” and “to revise or clarify how BACT determinations should be made.”<sup>46</sup> The U.S. Court of Appeals for the District of Columbia (D.C.) Circuit administratively terminated the lawsuit on its own motion without prejudice in 1995, presumably due to the dormancy of the action.<sup>47</sup>

### B. EPA’s Defense of the Top-Down Method

In 1989, in response to industry complaints, then-Air Quality Management Division Director John Calcagni transmitted a spirited defense of the top-down policy,<sup>48</sup> asserting that the policy does not alter existing BACT requirements,<sup>49</sup> that it reduces administrative burdens

on reviewing authorities,<sup>50</sup> that it is consistent with the CAA,<sup>51</sup> that it retains important distinctions between BACT and LAER,<sup>52</sup> that states are still free to weigh the relevant factors,<sup>53</sup> and that it is appropriate to implement the top-down process through BACT guidance and adjudication rather than rulemaking.<sup>54</sup>

Without getting deep into the weeds of administrative law, it is worth noting that the bottom-up policy favored by industry—and which industry claimed could not be changed without formal rulemaking—was itself never adopted through such rulemaking. The rulemaking issue thus seems reduced to the following question: does the statute (or any other rule of law) mandate the promulgation of formal rules establishing a decision procedure for the case-by-case determination of BACT? It seems doubtful. Certainly, the CAA—which mandates the promulgation of dozens and dozens of rules—does not order the promulgation of rules governing the BACT determination process.

In any event, industry seems to have made its peace with EPA’s top-down policy. Perhaps it did so because it recognized the strength of the Agency’s defense; after all, the policy merely establishes a framework for assuring that all aspects of the statutory BACT definition be considered in each case-by-case determination. The accommodation

... that the TACB letter need not be interpreted as a specific commitment by the State to follow a ‘Top-Down’ approach to BACT determinations”).

44. See Wilson et al., *supra* note 36, at 10070. See also In the Matter of World Color Press, PSD Appeal No. 88-4, 1990 WL 324095, 3 E.A.D. 474, 1990 EPA App. LEXIS 40 (EAB Dec. 13, 1990), at slip op. 7-8 (noting permit applicant’s assertion that the top-down policy “is a substantive rule adopted . . . without notice and comment”).

45. See Wilson et al., *supra* note 36, at 10070. Four authors went so far as to say that the top-down approach of the PSD BACT program “forces the most stringent, technologically feasible control option on a source regardless of energy penalties, costs, or other factors.” William A. Wichers II et al., *Regulation of Hazardous Air Pollutants Under the New Clean Air Act: Technology-Based Standards at Last*, 22 ELR 10717, 10723 (Nov. 1992). This assertion is incorrect (the citation to the underlying source indicates that the source was actually speaking of LAER) because it ignores Step 4 of the top-down approach. See *BACT Determination Part II*, *supra* note 15.

Meanwhile, the U.S. Senate Report on the 1990 CAA Amendments indicated a fondness for the top-down approach, declaring that, for certain hazardous air pollutants, “the Administrator is to establish the MACT standard for the existing source category using the ‘top-down’ process for BACT determinations which has recently been adopted by the Agency in the PSD program.” S. REP. NO. 228, 101st Cong., 1st Sess. 143, (1989), reprinted in 1990 U.S.C.C.A.N. 3385, 3555.

46. See 56 Fed. Reg. 34202 (July 26, 1991) (request for public comment on proposed settlement). See also 61 Fed. Reg. 38250, 38282 (July 23, 1996) (observing that a notice of proposed rulemaking was in furtherance of the settlement agreement).

47. See *API v. EPA*, 1995 WL 311743 (D.C. Cir. 1995) (“an administrative termination allows the court to clear its statistical docket of older cases in which no activity before the court is expected in the near future and relieves the court of the necessity of monitoring the cases to keep them in a current status”). Meanwhile, EPA Administrator William K. Reilly had issued a 1993 memorandum announcing his decision to retain the top-down policy. See 58 Fed. Reg. 11602, 11602 (Feb. 26, 1993).

48. See Background Statement, *supra* note 23, at 1 (“this statement focuses on a background discussion explaining why EPA has adopted its current policy on BACT, and clarifying EPA’s view that this policy is consistent with current statutory and regulatory requirements”).

49. EPA noted that the top-down policy made no changes in the BACT definition or the “core criteria” that must be applied in any BACT analysis: “the applicant must consider all available alternatives, and demonstrate why the most stringent should not be adopted.” Background Statement, *supra* note 23, at 4. The only change

is the emphasis upon considering the most stringent control options first . . . explicitly recogniz[ing] the self-evident presumption that technologies already shown to be “available” can be used by the

prospective source . . . and the fact that the PSD applicant is in the best position to provide an initial justification [for] why an available technology is not “achievable” . . .

*Id.* at 4-5. The Agency insisted that “this does not represent a radical shift in the burden of proof from permitting authorities to PSD applicants.” *Id.* at 4. *But see* 54 Fed. Reg. 23978 (June 5, 1989) (“The top-down approach places the burden of proof on . . . the applicant.”).

Nevertheless, the top-down policy was expressly designed to make it more difficult for permit applicants to obtain lenient BACT determinations. If the policy has succeeded, it has done so largely by shifting the burden of justifying less-stringent technology alternatives to the permit applicant.

50. Under the bottom-up approach, the applicant could simply identify the “base case”—the technology that would have been required had there been no BACT—and claim that each alternative control strategy affording greater degrees of emission reduction would cause unreasonable adverse energy, environmental, or economic impacts. A conscientious reviewing authority would then be required to analyze each alternative technology. By contrast, “the top-down process should . . . lessen administrative burdens . . . because it does not require a full analysis of all control alternatives that are more stringent than the NSPS or other base case . . .” Background Statement, *supra* note 23, at 3-4. See also In the Matter of Union County Resource Recovery Facility, PSD Appeal No. 90-1, 1990 WL 324096, 3 E.A.D. 455, 1990 EPA App. LEXIS 41 (EPA Admr. Nov. 28, 1990), at slip op. 8 (“the applicant was not required to justify its rejection of other technologies, since the technology selected was the most stringent”).

51. See Background Statement, *supra* note 23, at 5-6. Because “Congress intended BACT to perform a technology-forcing function,” it is appropriate to require the permit applicant to “demonstrate . . . why the most stringent control technology ‘available’ is not ‘achievable’ . . .” *Id.* at 5.

52. Any emission limitation established through a LAER determination “is presumably ‘available’ for BACT purposes by any source in the same category.” Background Statement, *supra* note 23, at 6. This is why the BACT determination should begin at the “top.” Nevertheless, the top-down policy does not establish LAER as a national BACT standard, because the case-by-case analysis of the statutory factors may lead a permitting authority to conclude that limitations achievable at some facilities through LAER technology are not achievable at the applicant’s facility. See *id.* at 7.

53. See Background Statement, *supra* note 23, at 7 (the top-down policy “does not prejudice the weight that permitting authorities must give to the relevant statutory factors”).

54. See Background Statement, *supra* note 23, at 8 (the adjudicative decisions that have helped shape development of the top-down policy “do not change the law, but at most interpret existing law”).

between industry and EPA may also be due to the Agency's clarification of the limited sphere of actors who must employ the top-down approach. Finally, it may be difficult for industry to quarrel with a policy shaped during the Reagan Administration and endorsed and retained during the Administrations of four subsequent presidents.

### C. To Whose BACT Determinations Does the Top-Down Method Apply?

In the years immediately following EPA's adoption of the top-down policy, the Agency suggested in at least two instances that it intended to make that policy mandatory throughout the country. The strongest suggestion came when EPA proposed approval of Texas state implementation plan (SIP) revisions in 1989. After describing the 1987 Potter Memorandum,<sup>55</sup> calling on states to use the top-down approach, the notice stated: "The EPA also interprets this letter as committing the [Texas Air Control Board] to follow applicable EPA policies such as the 'Top-Down' approach. This letter will be incorporated into the SIP upon the final approval action."<sup>56</sup> Also in 1989, the Agency declared in approving the delegation of full PSD authority to the state of Hawaii: "[EPA] will consider as deficient any BACT determinations that do not begin with the most stringent control options available for that source category."<sup>57</sup> Each of these publications suggested an administrative cram-down of the top-down policy.

EPA has subsequently backed away from the notion that the top-down approach must be used in every BACT determination throughout the country. Today, the binding effect of the top-down approach depends on the status of the reviewing authority. The Potter Memorandum itself recognized this possibility, "instruct[ing] EPA Regional Offices to use the top-down approach in their own BACT determinations, and to strongly encourage State and local PSD permitting authorities to do so as well."<sup>58</sup>

The U.S. Supreme Court noted in 2004 that "[n]othing in the Act or its implementing regulations mandates top-down analysis."<sup>59</sup> Ten years after the Potter Memorandum, the Agency explained:

[I]t remains EPA's policy to use the five-step, top-down process to satisfy the . . . BACT requirements when PSD permits are issued by EPA and delegated permitting author-

ities, and we continue to interpret the BACT requirement in the Clean Air Act and EPA regulations to be satisfied when BACT is established using this process, as it has been described in decisions of the Environmental Appeals Board. However, notwithstanding this policy and the interpretations of the BACT requirement reflected in EPA adjudications, EPA has not established the top-down BACT process as a binding requirement through regulation.<sup>60</sup>

In its 2011 Permitting Guidance for Greenhouse Gases, EPA further explained the situations in which it will insist that BACT be determined through the top-down method and those in which the use of the method is optional:

For over 20 years, EPA has applied and recommended that permitting authorities apply the top-down approach to ensure compliance with the BACT criteria in the CAA and applicable regulations. EPA Regional Offices that implement the federal PSD program (through . . . FIPs) and state permitting authorities that implement the federal program through a delegation of federal authority from an EPA Regional Office should apply the top-down BACT process in accordance with EPA policies and interpretations articulated in this document and others that are referenced. However, EPA has not established the top-down BACT process as a binding requirement through rule. Thus, permitting authorities that implement an EPA-approved PSD permitting program contained in their . . . SIPs may use another process for determining BACT in permits they issue, including BACT for [greenhouse gases], so long as that process (and each BACT determination made through that process) complies with the relevant statutory and regulatory requirements. EPA does not require states to apply the top-down process in order to obtain EPA approval of a PSD program, but EPA regulations do require that each state program apply the applicable criteria in the definition of BACT.<sup>61</sup>

In the end, these distinctions may make little difference. To be sure, EPA cannot reject BACT determinations by states with approved PSD programs on the ground that such a state has failed to employ the top-down approach. After all, the approach is not mandatory in such states. Nevertheless, EPA can and does reject BACT determinations that fail to analyze in a sufficiently principled way the concerns mandated in the statutory BACT definition, and

55. See *supra* note 38 and accompanying text.

56. 54 Fed. Reg. 52823, 52825 (Dec. 22, 1989).

57. 54 Fed. Reg. 23978, 23979 (June 5, 1989).

58. Background Statement, *supra* note 23, at 3. The Potter Memorandum "further directed Regional Offices to . . . comment adversely on proposed PSD permits that failed to adequately consider the more stringent control options" and to consider deficient any permits failing to reflect "adequate consideration of the relevant BACT factors." *Id.*

59. Alaska Dept. of Environmental Conservation v. EPA, 540 U.S. 461, 476 n.7, 34 ELR 20012 (2004). See also *In re Desert Rock Energy Co.*, 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 98-99 (top-down method is not binding, but "because it provides a framework for determining BACT that assures adequate consideration of the statutory and regulatory criteria, it has guided state and federal permit issuers, as well as PSD permit applicants, on PSD requirements and policy for years").

60. 72 Fed. Reg. 31372, 31380 (2007).

61. Permitting Guidance for Greenhouse Gases, *supra* note 25, at 19. Texas is at least one state that uses an approach other than the top-down method when determining BACT. See Interim Phase I Report of the Climate Change Work Group of the Permits, New Source Review and Toxics Subcommittee, Clean Air Act Advisory Committee, in Global Warming, Climate Change and the Law, SR039 ALI-ABA 115 (Feb. 3, 2010), available at [http://www.epa.gov/oar/caaac/climate/2010\\_02\\_InterimPhaseIReport.pdf](http://www.epa.gov/oar/caaac/climate/2010_02_InterimPhaseIReport.pdf). See also 57 Fed. Reg. 28093, 28096 (June 24, 1992) ("the [Texas Air Control Board] letter need not be interpreted as a specific commitment by the State to follow a 'Top-Down' approach to BACT determinations"); *In re Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, 2009 WL 443976, 2009 EPA App. LEXIS 5 (EAB Feb. 18, 2009), at slip op. 32 (noting Michigan State Manual suggestion that the top-down approach of the 1990 Workshop Manual be avoided as "[h]ighly complex and quantitative, [d]ifficult to agree upon, and [t]ime and resource intensive").

failure to employ the top-down approach may increase the likelihood that the Agency will find the BACT determination to be deficient.<sup>62</sup> Accordingly, an applicant who seeks to minimize delay may be wise to cooperate in a rigorous top-down analysis.

#### D. The Five Steps of the Top-Down Method

The top-down approach involves five formalized steps:

Step 1: Identify all available control technologies

Step 2: Eliminate technically infeasible options

Step 3: Rank remaining technologies by control effectiveness

Step 4: Eliminate control options based on evaluation of collateral impacts, thereby selecting the BACT technology<sup>63</sup>

Step 5: Specify the BACT emission limitation<sup>64</sup>

EPA offers the following narrative summary:

To illustrate how the analysis proceeds through these steps, assume at Step 1 that the permit applicant and permitting authority identify four control strategies that may be applicable to the particular source under review. At the second step of the process, assume that one of these four options is demonstrated to be technically infeasible for the source and is eliminated from further consideration. The remaining three pollution control options should then be ranked from the most to the least effective at the third step of the process. In the fourth step, the permit applicant and permitting authority should begin by evaluating the energy, environmental, and economic impacts of the top-ranked option. If these considerations do not justify eliminating the top-ranked option, it should be selected as BACT at the fifth step. However, if the energy, environmental, or economic impacts of the top-ranked option demonstrate that this option is not achievable, then the evaluation remains in Step 4 of the process and continues

with an examination of the energy, environmental, and economic impacts of the second-ranked option. This Step 4 assessment should continue until an achievable option is identified for each source. The highest-ranked option that cannot be eliminated is selected as BACT at Step 5, which includes the development of an emissions limitation that is achievable by the particular source using the selected control strategy. Thus, the inclusion and evaluation of an option as part of a top-down BACT analysis for a particular source does not necessarily mean that option will ultimately be required as BACT for that source.<sup>65</sup>

We discuss each of these steps in the following sections.

### IV. Top-Down Step 1: Identifying All Available Control Technologies

The first step in the top-down analysis is to identify all “available” control options for the emissions unit in question.<sup>66</sup> “Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation.”<sup>67</sup> Potentially applicable control alternatives may be broken into three categories: inherently lower emitting processes or practices, add-on controls, and combinations of the first two types of alternatives.<sup>68</sup> “The top-down BACT analysis should consider potentially applicable control techniques from all three categories.”<sup>69</sup>

In assembling the Step 1 list of available control options, the permit applicant is urged to consult the RACT/BACT/LAER Clearinghouse<sup>70</sup> and other reliable sources.<sup>71</sup> Controls selected in LAER determinations are available, and

62. See *In re Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, 2009 WL 443976, 2009 EPA App. LEXIS 5 (EAB Feb. 18, 2009), at slip op. 52-53 (Michigan Department of Environmental Quality (MDEQ)’s failure to follow the top-down approach “or any method consistently faithful to statutory and regulatory guidelines” justified remand to MDEQ for reconsideration of BACT limitations); *In re General Motors*, PSD Appeal No. 01-30, 10 E.A.D. 360, 2002 WL 373982, 2002 EPA App. LEXIS 2 (EAB Mar. 6, 2002), at slip op. 14-15 (“strict application of the [top-down] methodology . . . is not mandatory [but] . . . in evaluating the rationality and defensibility of BACT determinations by permitting authorities, the Board has required an analysis that reflects a level of detail in the BACT analysis comparable to the [top-down] methodology”).

63. It is sometimes said that BACT is selected in Step 5. However, the BACT technology emerges from the Step 4 analysis. Accordingly, we describe Step 5 as the articulation of the emission limitation compelled by the BACT technology selected in Step 4.

64. This summary of the steps is based on language found in several sources. The language of Steps 1-3 and 5 is adapted from the 1990 Workshop Manual, *supra* note 6, at B.4, tbl. B-1. The language of Step 4 is taken from Climate Change Workgroup, Clean Air Act Advisory Committee, Permits, New Source Review, and Toxics Subcommittee, New Source Review BACT Review (PowerPoint illustrations) (Oct. 6, 2009). See also Permitting Guidance for Greenhouse Gases, *supra* note 25, at 18.

65. Permitting Guidance for Greenhouse Gases, *supra* note 25, at 18.

66. See 1990 Workshop Manual, *supra* note 6, at B.4. “[T]he term ‘emissions unit’ should be read to mean emissions unit, process or activity.” *Id.* The process of determining which emissions units must undergo BACT analysis can be a complicated undertaking:

All emissions units involved in a major modification or a new major source that emit, or increase emissions of (in the case of a modified emissions unit), applicable pollutants must undergo BACT analysis. Because each applicable pollutant must be analyzed, many emissions units, such as combustion sources, must undergo BACT analysis for more than one pollutant. Units that are sources of fugitive emissions must also be included in a BACT analysis.

1980 Workshop Manual, *supra* note 24, at B.2.2. See also Permitting Guidance for Greenhouse Gases, *supra* note 25, at 22 (“EPA has generally recommended that permit applicants and permitting authorities conduct a separate BACT analysis for each emissions unit at a facility and has also encouraged applicants and permitting authorities to consider logical groupings of emissions units as appropriate on a case-by-case basis”).

67. 1990 Workshop Manual, *supra* note 6, at B.4. See also *In re Knauf Fiber Glass PSD Permit No. 97-PO-06*, PSD Appeal Nos. 98-3 through 98-20, 1999 WL 64235, 8 E.A.D. 121, 1999 EPA App. LEXIS 2 (EAB Feb. 4, 1999), at slip op. 21 (“The term available is used in its broadest sense under the first step and refers to control options with a ‘practical potential for application to the emissions unit’ under evaluation”). “Air pollution control technologies and techniques include the application of production process or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the affected pollutant.” 1990 Workshop Manual, *supra* note 6, at B.4.

68. See 1990 Workshop Manual, *supra* note 6, at B.9.

69. *Id.*

70. See *supra* notes 18-22 and accompanying text.

71. See Climate Change Workgroup, *supra* note 64; 1990 Workshop Manual, *supra* note 6, at B.10.



must be included in Step 1; they “may frequently be found to represent the top control alternative at later steps in the BACT analysis.”<sup>72</sup> It is essential that this list be complete<sup>73</sup>; an incomplete listing of all available control technologies in Step 1 may lead to EPA disapproval of the BACT determination.<sup>74</sup> In particular, technologies cannot be omitted from Step 1 for any reason other than unavailability: “arguments about the technical viability or the economics of [a given technology] at the proposed facility are inapplicable at stage 1 of the BACT analysis.”<sup>75</sup>

The Agency insists that the Step 1 list must include “demonstrated” technologies<sup>76</sup> and “transferable” technologies,<sup>77</sup> including technologies employed outside the United States.<sup>78</sup> Moreover, “[t]he fact that a NSPS for a source category does not require a certain level of control or particular control technology does not preclude its consideration in the top-down BACT analysis.”<sup>79</sup> On the other hand, “[t]echnologies which have not yet been applied to (or permitted for) full scale operations need not be considered available.”<sup>80</sup>

72. Permitting Guidance for Greenhouse Gases, *supra* note 25, at 25.

73. The Agency stresses that factors to be considered in later steps must be ignored during the Step 1 analysis:

In the course of the BACT analysis, one or more of the options may be eliminated from consideration because they are demonstrated to be technically infeasible or have unacceptable energy, economic, and environmental impacts on a case-by-case (or site-specific) basis. However, at the outset, applicants should initially identify all control options with potential application to the emissions unit under review.

1990 Workshop Manual, *supra* note 6, at B.4-B.6.

74. *See, e.g.*, In re Knauf Fiber Glass PSD Permit No. 97-PO-06, PSD Appeal Nos. 98-3 through 98-20, 1999 WL 64235, 8 E.A.D. 121, 1999 EPA App. LEXIS 2 (EAB Feb. 4, 1999), at slip op. 33 (“the permit application does not include a listing of all possible control options”). The EAB has explained: “[T]he BACT step 1 analysis is intended to be very broad, leading to the development of a comprehensive list of control options. . . . The Board has previously held that failure to consider all potentially applicable control options is grounds for remand.” In re Desert Rock Energy Co., 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 101.

75. In re Desert Rock Energy Co., 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 135.

76. *See* 1990 Workshop Manual, *supra* note 6, at B.10.

77. The agency explains: “Opportunities for technology transfer lie where a control technology has been applied at source categories other than the source under consideration. Such opportunities should be identified.” 1990 Workshop Manual, *supra* note 6, at B.10.

78. *Id.* at B.4, B.10.

79. *Id.* at B.11. “When developing a list of possible BACT alternatives, the only reason for comparing control options to an NSPS is to determine whether the control option would result in an emissions level less stringent than the NSPS. If so, the option is unacceptable.” *Id.*

80. *Id.* at B.10. The Manual further explains:

A control technique is considered available . . . if it has reached the licensing and commercial sales stage of development. A source would not be required to experience extended time delays or resource penalties to allow research to be conducted on a new technique. Neither is it expected that an applicant would be required to experience extended trials to learn how to apply a technology on a totally new and dissimilar source type. Consequently, technologies in the pilot scale testing stages of development would not be considered available for BACT review . . . [although] the technology [could be] proposed and permitted under the qualifications of an innovative control device . . . .

*Id.* at B.17.

## A. “Demonstrated” Technologies

The 1990 Workshop Manual declares that PSD permit applicants “are expected to identify all demonstrated . . . control technology alternatives.”<sup>81</sup> If a control technology has been installed and successfully operated on the type of facility under review, it is demonstrated.<sup>82</sup> “[A]n applicant should be able to purchase or construct a process or control device that has already been demonstrated in practice.”<sup>83</sup> The Manual contrasts demonstrated technologies with innovative ones: “an innovative technology is still under development and has not been demonstrated in a commercial application on identical or similar emission units.”<sup>84</sup>

In 1996, EPA proposed to amend its regulations to expressly require BACT analysis for all technologies that have been “demonstrated in practice.”<sup>85</sup> The proposed regulations also included an elaborate definition of that term:

(42) Demonstrated in practice means, for the purposes of this section, a control technology that has been—

(i) Listed in or required by any of the following:

(A) The EPA’s RACT/BACT/LAER Clearinghouse;

(B) A major source construction permit issued pursuant to either part C or D of title I of the Act;

(C) An emissions limitation contained in a federally-approved plan, excluding emissions limitations established by permits issued pursuant to programs for non-major sources;

(D) A permit or standard under section 111 or 112 of the Act;

(E) The EPA’s Alternative Control Techniques documents and Control Techniques Guidelines; or

(ii) Notwithstanding paragraph (b)(42)(i) of this section installed and operating on an emissions unit (or units) which:

(A) Has operated at a minimum of 50 percent of design capacity for 6 months; and

81. *Id.* at B.10.

82. *Id.* at B.16; *BACT Determination Part II*, *supra* note 15, at n.7. The EAB has defined “demonstrated” as a technology that “has been installed and operated successfully elsewhere on a similar facility.” In re Desert Rock Energy Co., 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 102. *See also* In re Steel Dynamics PSD Permit No. CP-183-10097-00030, PSD Appeal Nos. 99-4 & 99-5, 2000 WL 833062, 9 E.A.D. 165, 2000 EPA App. LEXIS 18 (EAB June 22, 2000), at slip op. 85-86 (demonstrated means that a technology “has been installed and operated successfully on the type of source under review”).

83. 1990 Workshop Manual, *supra* note 6, at B.10.

84. *Id.* at B.12.

85. *See* 61 Fed. Reg. 38250, 38275 (July 23, 1996). *See also id.* at 38332, *proposing new* 40 C.F.R. §51.166(j)(5)(i)(A) (“The applicant shall identify and evaluate all available and technically feasible control technology alternatives that have been demonstrated in practice”); *id.* at 38340, *proposing new* 40 C.F.R. §52.21(j)(5)(i)(A). The proposed language also included cutoff dates for determining when newly emerging technologies need no longer be considered by the PSD permit applicant. We address the BACT determination cutoff date in *BACT Determination Part II*, *supra* note 15.

- (B) The pollution control efficiency performance has been verified with either:
- (1) A performance test; or
  - (2) Performance data collected at the maximum design capacity of the emissions unit (or units) being controlled, or 90 percent or more of the control technology's designed specifications.<sup>86</sup>

Although we have been unable to find an explanation for the disappearance of this proposal, today's PSD regulations do not contain any such language.<sup>87</sup>

The proposed approach to technologies that have not been mandated by any regulatory body is especially interesting. The Agency explained:

Control technologies that may not be implemented in a regulatory context of a substantive Act program may nevertheless be available for a given BACT . . . analysis. For example, sources often install state-of-the-art technology in order to be classified as a minor source or to avoid NSR requirements for major modifications. . . . Furthermore, new technologies and innovations of existing technologies occasionally evolve without wide publicity in the regulatory arena. Such technologies also deserve consideration. . . . The 6-month operating requirement within the definition of "demonstrated in practice" is proposed to establish a minimum operating history to demonstrate the performance and reliability of the new technology. . . . The EPA also believes that the 50 percent continual load factor provides some assurance that the control technology has been placed in meaningful service during the 6-month period, while recognizing that higher loads may not be sustainable by the source for extended periods of time so soon after start-up.<sup>88</sup>

Had this proposal been adopted, the universe of demonstrated technologies—particularly newly emerging technologies—to be included in the top-down Step 1 analysis would have been concretely specified in the regulations. Despite abandonment of the draft regulations, the proposal does provide some insight into EPA's expansive approach to the Step 1 listing process.<sup>89</sup>

86. 61 Fed. Reg. 38250, 38332 (July 23, 1996), *proposing new* 40 C.F.R. §51.166(b)(42). *See also id.* at 38339, *proposing new* 40 C.F.R. §52.21(b)(43).

87. *See also BACT Determination Part II*, *supra* note 15, concerning the discarded proposal to define the BACT determination cutoff date.

88. 61 Fed. Reg. 38250, 38275 (July 23, 1996). The six-month testing requirement "is similar to that found under the NSPS, which requires facilities to conduct performance tests within the period 60 to 180 days after startup to determine compliance with the applicable standards." *Id.*

89. Now that greenhouse gases are regulated pollutants for purposes of BACT, EPA has begun struggling with the issue of whether carbon capture and storage (CCS)—sometimes called carbon sequestration—must be included in the Step 1 list. In its 2011 Permitting Guidance for Greenhouse Gases, EPA declared:

For the purposes of a BACT analysis for GHGs [greenhouse gases], EPA classifies CCS as an add-on pollution control technology that is "available" for facilities emitting CO<sub>2</sub> in large amounts, including fossil fuel-fired power plants, and for industrial facilities with high-purity CO<sub>2</sub> streams (e.g., hydrogen production, ammonia

## B. Transferable Technologies

The 1990 Workshop Manual also insists that the applicant must consider potentially transferable technologies when compiling the Step 1 list.

The control alternatives should include not only existing controls for the source category in question, but also (through technology transfer) controls applied to similar source categories and gas streams . . . .

Opportunities for technology transfer lie where a control technology has been applied at source categories other than the source under consideration. Such opportunities should be identified.<sup>90</sup>

Although all potentially transferable technologies must be included in the Step 1 list, this does not necessarily mean that one of them will be selected as BACT. Step 1 considers only the availability of control methods with a practical potential for application at the applicant's facility. In Step 2, one or more of the potentially transferable technologies listed in Step 1 may be found to be infeasible when applied to the applicant's facility.<sup>91</sup> Moreover, consideration of the Step 4 factors of "energy, environmental, and economic impacts and other costs" may eventually eliminate even a feasible transferable technology.<sup>92</sup>

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production, natural gas processing, ethanol production, ethylene oxide production, cement production, and iron and steel manufacturing). For these types of facilities, CCS should be listed in Step 1 of a top-down BACT analysis for GHGs. This does not necessarily mean CCS should be selected as BACT for such sources.

Permitting Guidance for Greenhouse Gases, *supra* note 25, at 32. The Agency's suggestion that CCS must be included in the Step 1 list has been criticized by the electric power industry. *See* 41 [Curr. Dev.] *Env't. Rep.* (BNA) 2800 (2010) (quoting industry comment that "CCS has not yet been demonstrated at scale . . . [and] is not available for Step 1 because it has not yet matured").

90. 1990 Workshop Manual, *supra* note 6, at B.4, B.10. The Manual further declares: "Technology transfer must be considered in identifying control options. The fact that a control option has never been applied to process emission units similar or identical to that proposed does not mean it can be ignored in the BACT analysis if the potential for its application exists." *Id.* at B.15. *See also* 61 Fed. Reg. 38250, 38276 (July 23, 1996) ("Technology transfer is appropriate when sources or source categories have similar emission stream characteristics."); In the Matter of Spokane Regional Waste-to-Energy, PSD Appeal No. 88-12, 1989 WL 266360, 2 E.A.D. 809, 1989 EPA App. LEXIS 23 (EPA Admr. June 9, 1989), at slip op. 21 n.24 ("a technology that is in actual use for controlling a regulated pollutant in one source category—and thus is clearly available—may be required for control of that same pollutant in another source category, provided sufficient data can be readily generated to establish transferability").

91. *See BACT Determination Part II*, *supra* note 15. The line between the Step 1 and Step 2 analyses may become blurred for transferable technologies. For example, if it seems obvious that an allegedly transferable technology could never be successfully applied to the applicant's facility, the technology is technically available and should appear on the Step 1 list, to be winnowed by the Step 2 feasibility analysis. Nevertheless, it would be hard to fault a permit applicant who left such a technology off the Step 1 list.

92. *See* 43 Fed. Reg. 26388 (June 19, 1978) ("due consideration of the other factors . . . must also be given before requiring such technology transfer in order to comply with the BACT requirement"). *See also BACT Determination Part II*, *supra* note 15.

### C. Innovative Technologies

The 1990 Workshop Manual distinguishes potentially transferable technologies from “innovative technologies”:

To be considered innovative, a control technique must meet the provisions of 40 C.F.R. 52.21(b)(19)<sup>93</sup> or, where appropriate, the applicable SIP definition. In essence, if a developing technology has the potential to achieve a more stringent emissions level than otherwise would constitute BACT or the same level at a lower cost, it may be proposed as an innovative control technology. Innovative technologies are distinguished from technology transfer BACT candidates in that an innovative technology is still under development and has not been demonstrated in a commercial application on identical or similar emission units.<sup>94</sup>

EPA has taken the position that the Step 1 list need not include innovative technologies, although the applicant may choose to include them.<sup>95</sup>

If an applicant seeks to obtain a BACT standard based on innovative technology, the reviewing authority may grant an innovative technology waiver<sup>96</sup> in accordance with a complicated set of conditions set forth in the regulations.<sup>97</sup> Under these waivers, facilities employing innovative technology are given an extended phase-in time frame to comply with emissions limits.<sup>98</sup> If the distinction between innovative and transferable technology is unclear in a given case, the reviewing authority should consult with EPA prior to issuing a waiver.<sup>99</sup>

During the first 15 years after its adoption in 1980, the innovative technology waiver was not widely used<sup>100</sup>; we have seen no indication that its use has become more common since then. Moreover, EPA has in the past approved only a limited number of innovative control technology waivers for each specific control technology, pointing out

that subsequent applicants seeking to use the same technology at the same types of facilities are no longer innovative.<sup>101</sup> The Agency has now indicated that it may be more generous with future waivers:

[I]n 1996, EPA said that it was inclined to allow additional waivers if the criteria in the CAA for such a waiver under the NSPS program<sup>102</sup> were met. EPA proposed revisions to this provision in the PSD rules to incorporate the statutory criteria from the NSPS program, which specifies that such waivers may not exceed the number the administrator finds necessary to ascertain whether the criteria for issuing a waiver are met. Though the 1996 proposal was never issued as final policy, EPA continues to adhere to the view expressed in that 1996 proposal and will consider approving more than one waiver under these conditions.<sup>103</sup>

### D. EPA's Policy Position Against Redefining the Source

The most difficult Step 1 issue, by far, is the problem of determining which control options should be excluded on the ground that they would violate EPA's stated policy against using BACT to redefine the source proposed by the permit applicant.<sup>104</sup> The policy has been reiterated by the Agency on many occasions. One of the clearest statements is set forth in the 1990 Workshop Manual:

Historically, EPA has not considered the BACT requirement as a means to redefine the design of the source when considering available control alternatives. For example, applicants proposing to construct a coal-fired electric generator, have not been required by EPA as part of a BACT analysis to consider building a natural gas-fired electric turbine<sup>105</sup> although the turbine may be inherently less polluting per unit product (in this case electricity). However, this is an aspect of the PSD permitting process in which states have the discretion to engage in a broader analysis if they so desire. Thus, a gas turbine normally would not be included in the list of control alternatives for a coal-fired boiler. However, there may be instances where, in the permit authority's judgment, the consideration of alterna-

93. The regulatory definition provides:

Innovative control technology means any system of air pollution control that has not been adequately demonstrated in practice, but would have a substantial likelihood of achieving greater continuous emissions reduction than any control system in current practice or of achieving at least comparable reductions at lower cost in terms of energy, economics, or nonair quality environmental impacts.

40 C.F.R. §51.166(b)(19). See also 40 C.F.R. §52.21(b)(19).

94. 1990 Workshop Manual, *supra* note 6, at B.12.

95. *Id.* at B.11 (“Although not required in step 1, the applicant may also evaluate and propose innovative technologies as BACT.”).

96. 61 Fed. Reg. 38250, 38278 (July 23, 1996) (“Innovative Control Technology (ICT) Waiver . . . is termed a waiver since a source is allowed an extended period of time to bring the new technology into compliance with the required performance level.”).

97. See 40 C.F.R. §51.166(s). See also 40 C.F.R. §52.21(v). The regulations contain at least nine conditions, including consent of the governors of all affected states. See 40 C.F.R. §51.166(s)(2); 40 C.F.R. §52.21(v)(2). See also 50 Fed. Reg. 7777, 7778 (Feb. 26, 1985) (withholding approval of Tennessee SIP provision for consultation with—but not consent of—affected governors); 49 Fed. Reg. 48185 (Dec. 11, 1984) (disapproving Kansas SIP innovative technology waiver lacking any provision for consent of affected governors). Because there is always a risk that innovative technology may not live up to its promise, the regulations provide a mechanism for withdrawal of the waiver. See 40 C.F.R. §51.166(s)(3); 40 C.F.R. §52.21(v)(3).

98. See 41 [Curr. Dev.] Env't Rep. (BNA) 2504 (2010).

99. See 1990 Workshop Manual, *supra* note 6, at B.12.

100. See 61 Fed. Reg. 38250, 38278 (July 23, 1996).

101. See 1990 Workshop Manual, *supra* note 6, at B.12.

102. The innovative technology waiver of the PSD BACT program was initially modeled after the waiver authorized by CAA §111(j), 42 U.S.C. §7411(j). See 43 Fed. Reg. 26388, 26397 (June 19, 1978). The Agency's claimed authority to impose BACT in the form of design, equipment, work practice, or operational standards is also modeled after §111. See *BACT Requirement*, *supra* note 2, at text accompanying notes 168-88.

103. Permitting Guidance for Greenhouse Gases, *supra* note 25, at 28.

104. EPA most frequently uses the phrase “redefine the source.” See, e.g., 1990 Workshop Manual, *supra* note 6, at B.12-B.13. Occasionally, however, the Agency and other actors use the term “redesign the source.” See, e.g., *Sierra Club v. EPA*, 499 F.3d 653, 655-56, 37 ELR 20226 (7th Cir. 2007). These two phrases should be treated as synonyms.

105. See *In the Matter of Old Dominion Electric Cooperative*, PSD Appeal No. 91-39, 1992 WL 92372, 3 E.A.D. 779, 1992 EPA App. LEXIS 37 (EPA Admr. Jan. 29, 1992), at slip op. 30-32 (upholding state's refusal to consider natural gas as an alternative fuel when determining BACT for a proposed pulverized coal-fired steam electric-generating plant, notwithstanding the 1990 CAA Amendment's addition of the term “clean fuels” to the statutory BACT definition).

tive production processes is warranted and appropriate for consideration in the BACT analysis. A production process is defined in terms of its physical and chemical unit operations used to produce the desired product from a specified set of raw materials. In such cases, the permit agency may require the applicant to include the inherently lower-polluting process in the list of BACT candidates.<sup>106</sup>

The foregoing language establishes two things. First, EPA will not insist on a BACT technology that would redefine the permit applicant's facility. Second, states are free to engage in a broader analysis and may effectively alter the definition of the source if they wish to do so.<sup>107</sup> We refer to these principles as EPA's source redefinition doctrine.

The difficulty comes in articulating just what requirements might be said to redefine the source. At one level, the Agency's position seems to be that the imposition of BACT cannot be used to alter the applicant's chosen "production process"—"the physical and chemical unit operations used to produce the desired product from a specified set of raw materials."<sup>108</sup> So viewed, the source would be inappropriately redefined if the imposition of BACT would change the raw material (substituting natural gas, for example, for coal),<sup>109</sup> would change the product (substituting widgets, for example, for gizmos), or would change the physical or chemical unit operations (substituting the gasification and subsequent burning of coal, for example, for the burning of pulverized coal). This simplistic reading of the policy might suggest that the only technologies to be considered in Step 1 are add-on controls.<sup>110</sup>

The problem with this approach is that the statutory BACT definition tells the permitting authority that it must

consider "production processes," "fuel cleaning,"<sup>111</sup> "clean fuels,"<sup>112</sup> and "innovative fuel combustion techniques" when selecting BACT.<sup>113</sup> Moreover, immediately after setting forth the foregoing articulation of the Agency's source redefinition policy, the 1990 Workshop Manual continues:

In many cases, a given production process or emissions unit can be made to be inherently less polluting (e.g., the use of water-based versus solvent based paints in a coating operation or a coal-fired boiler designed to have a low emission factor for NO<sub>x</sub>). In such cases the ability of design considerations to make the process inherently less polluting must be considered as a control alternative for the source. . . .

111. *Compare* In the Matter of Spokane Regional Waste-to-Energy, PSD Appeal No. 88-12, 1989 WL 266360, 2 E.A.D. 809, 1989 EPA App. LEXIS 23 (EPA Admr. June 9, 1989), at slip op. 24 (petitioners failed to show that fuel cleaning and separation at proposed municipal solid waste incinerator was an available technology for reducing emissions), *with* In the Matter of Brooklyn Navy Yard Resource Recovery Facility, PSD Appeal No. 88-10, 1992 WL 80946, 3 E.A.D. 867, 1992 EPA App. LEXIS 39 (EPA Admr. Feb. 28, 1992), at slip op. 17-18 (information now showed that fuel cleaning and separation in combination with pollution control equipment could reduce emissions and were thus available technologies for purposes of a BACT determination).

112. The Agency's position on "clean fuels" is as follows:

The CAA includes "clean fuels" in the definition of BACT. Thus, clean fuels which would reduce GHG emissions should be considered, but EPA has recognized that the initial list of control options for a BACT analysis does not need to include "clean fuel" options that would fundamentally redefine the source. Such options include those that would require a permit applicant to switch to a primary fuel type (i.e., coal, natural gas, or biomass) other than the type of fuel that an applicant proposes to use for its primary combustion process. For example, when an applicant proposes to construct a coal-fired steam electric generating unit, EPA continues to believe that permitting authorities can show in most cases that the option of using natural gas as a primary fuel would fundamentally redefine a coal-fired electric generating unit. Ultimately, however, a permitting authority retains the discretion to conduct a broader BACT analysis and to consider changes in the primary fuel in Step 1 of the analysis. EPA does not classify the option of using a cleaner form of the same type of fuel that a permit applicant proposes to use as a change in primary fuel, so these types of options should be assessed in a top-down BACT analysis in most cases. For example, a permitting authority may consider that some types of coal can have lower emissions of GHG than other forms of coal, and they may insist that the lower emitting coal be evaluated in the BACT review. Furthermore, when a permit applicant has incorporated a particular fuel into one aspect of the project design (such as startup or auxiliary applications), this suggests that a fuel is "available" to a permit applicant. In such circumstances, greater utilization of a fuel that the applicant is already proposing to use in some aspect of the project design should be listed as an option in Step 1 unless it can be demonstrated that such an option would disrupt the applicant's basic business purpose for the proposed facility.

Permitting Guidance for Greenhouse Gases, *supra* note 25, at 27-28. *See also* In re Prairie State Generating Co., PSD Appeal No. 05-05, 13 E.A.D. 1, 2006 EPA App. LEXIS 38 (EAB Aug. 24, 2006), at slip op. 42 ("proper BACT analysis must include consideration of cleaner forms of the fuel proposed by the source"); In the Matter of Hibbing Taconite Co., PSD Appeal No. 87-3, 1989 WL 266359, 2 E.A.D. 838, 1989 EPA App. LEXIS 24 (EPA Admr. July 19, 1989), at slip op. 11-12 (supporting Region V's insistence that taconite processing facility burn natural gas rather than petroleum coke, because facility was already equipped to burn natural gas and because the change in fuel would not alter the product).

113. *See* CAA §169(3), 42 U.S.C. §7479(3). *See also* Powder River Basin Resource Council v. Wyoming Dept. of Environmental Quality, 226 P.3d 809, 823 (Wyo. 2010) ("It is too simplistic to say that a proposed source is defined solely by the raw materials it uses and the product it makes.").

106. 1990 Workshop Manual, *supra* note 6, at B.12-B.13. *See also* Brian Doster, Defining and Redefining the "Source" for the PSD BACT Analysis (Feb. 3, 2010) (PowerPoint presentation) ("Since 1988, EPA has recognized that BACT options that fundamentally redefine the proposed source may be excluded at Step 1 of the analysis.").

107. The Agency has recently clarified the state's discretion to include or exclude technologies that may redefine a source:

EPA does not interpret the CAA to prohibit fundamentally redefining the source and has recognized that permitting authorities have the discretion to conduct a broader BACT analysis if they desire. The "redefining the source" issue is ultimately a question of degree that is within the discretion of the permitting authority. However, any decision to exclude an option on "redefining the source" grounds must be explained and documented in the permit record, especially where such an option has been identified as significant in public comments.

Permitting Guidance for Greenhouse Gases, *supra* note 25, at 27.

108. 1990 Workshop Manual, *supra* note 6, at B.12-B.13.

109. The EAB recently summarized its approach:

[T]he Board takes care to identify inherent design elements . . . part of the fundamental purpose of the proposed facility . . . or a design such that change to it would call into question [the facility's] existence. . . . This test shields from BACT review fuel choices found integral to the basic design. Proposed coal-fired electrical generators need not consider a natural gas turbine, for example.

In re Northern Michigan University Ripley Heating Plant, PSD Appeal No. 08-02, 2009 WL 443976, 2009 EPA App. LEXIS 5 (EAB Feb. 18, 2009), at slip op. 49-50.

110. *Cf.* Doster, *supra* note 106 ("The 'redefining the source' rationale is only appropriate for excluding inherently lower-emitting processes, not add-on controls.").

Combinations of inherently lower-polluting processes/practices (or a process made to be inherently less polluting) and add-on controls are likely to yield more effective means of emissions control than either approach alone. Therefore, the option to utilize a inherently lower-polluting process does not, in and of itself, mean that no additional add-on controls need be included in the BACT analysis. These combinations should be identified in step 1 of the top down process for evaluation in subsequent steps.<sup>114</sup>

The Agency has recently encouraged reviewing authorities to go through specific analytical steps in addressing the source redefinition issue:

In assessing whether an option would fundamentally redefine a proposed source, EPA recommends that permitting authorities apply the analytical framework recently articulated by the Environmental Appeals Board.<sup>115</sup> Under this framework, a permitting authority should look first at the administrative record to see how the applicant defined its goal, objectives, purpose or basic design for the proposed facility in its application. The underlying record will be an essential component of a supportable BACT determination that a proposed control technology redefines the source. The permitting authority should then take a “hard look” at the applicant’s proposed design in order to discern which design elements are inherent for the applicant’s purpose and which design elements may be changed to achieve pollutant emissions reductions without disrupting the applicant’s basic business purpose for the proposed facility. In doing so, the permitting authority should keep in mind that BACT, in most cases, should not be applied to regulate the applicant’s purpose<sup>116</sup> or

objective for the proposed facility. This approach does not preclude a permitting authority from considering options that would change aspects (either minor or significant) of an applicants’ proposed facility design in order to achieve pollutant reductions . . . .<sup>117</sup>

Two recurring controversies illustrate the difficulty of applying EPA’s source redefinition policy. First, may the substitution of low-sulfur coal for more polluting fuel be excluded from the BACT determination because it would redefine the source? Second, may the substitution of integrated gasification combined cycle (IGCC) technology for a proposed pulverized coal-burning facility be excluded from the BACT analysis because it would redefine the source?

### E. Would Substituting Low-Sulfur for High-Sulfur Coal Redefine the Source?

The issue of redefining the source reached the U.S. Court of Appeals for the Seventh Circuit in *Sierra Club v. EPA*.<sup>118</sup> Petitioners alleged that EPA had improperly ignored the option of burning low-sulfur coal when determining BACT for a proposed coal-fired electrical generating plant to be built in southern Illinois, near St. Louis.<sup>119</sup> EPA had concurred in the reviewing authority’s conclusion that mandating the use of low-sulfur coal would redefine the source and that, therefore, this option could be omitted from Step 1 of the top-down analysis.<sup>120</sup> The Seventh Circuit’s opinion sustaining EPA’s action was authored by Judge Richard Posner.

The permit applicant in *Sierra Club* proposed to construct a “mine-mouth” facility to be located near the location of a high-sulfur coal seam containing enough fuel to supply the plant for 30 years. The coal would be delivered to the plant by means of a conveyor belt more than one-half mile in length. Low-sulfur coal could not be used without making changes in the plant’s coal-receiving facility and arranging for transport of the fuel from more than 1,000 miles away. After noting EPA’s policy against using BACT to redefine the source,<sup>121</sup> the court struggled with the statutory command that “clean fuels” be considered when determining BACT:

The Act is explicit that clean fuels is one of the control methods that the EPA has to consider. Well, nuclear fuel is clean, and so the implication, one might think, is that the agency could order Prairie State to redesign its plant as

114. 1990 Workshop Manual, *supra* note 6, at B.13. The Manual then sets forth a detailed example setting forth eight Step 1 control technologies for hypothetical “automated surface coating process equipment” designed to produce “a specialized electronics component (resistor) with strict resistance property specifications that restrict the types of coatings that may be employed.” *Id.* at B.13-B.15. The example is sufficiently technical that its significance should probably be assessed with the help of an engineer.

115. *Citing In the Matter of American Electric Power Service Corp., Southwest Electric Power Co., John W. Turk Plant, Petition No. VI-2008-01 (Order on Petition) (Dec. 15, 2009); In the Matter of Cash Creek Generation, LLC, Petition Nos. IV-2008-1 & IV-2008-2 (Order on Petition) (Dec. 15, 2009).*

116. A Work Group appointed by EPA to examine how BACT should be determined for greenhouse gases could not reach consensus on the meaning of the term “fundamental business purpose.” See Interim Phase I Report, *supra* note 61, at 7. The Work Group reported:

Some members of the Work Group contended that . . . it is unlawful and inappropriate for BACT to include controls that would redefine or change the fundamental type of project proposed by the applicant. Permit issuers normally would not have the training or expertise necessary to evaluate an applicant’s business decision to proceed with a particular type of facility or project. Allowing BACT to include alternative methods to manufacture a product could force companies to consider manufacturing methods that are beyond their core areas of expertise. . . .

Other members . . . feel that . . . control technologies must be considered unless they are unavailable or would materially change the product or service provided by the proposed source. These . . . members believe that EPA should not invoke the redefining the source justification to preclude consideration of the full range of control measures listed in the statute.

*Id.* at 7-8.

117. Permitting Guidance for Greenhouse Gases, *supra* note 25, at 26 & n.68.

118. 499 F.3d 653, 37 ELR 20226 (7th Cir. 2007).

119. *See id.* at 654.

120. *See In re Prairie State Generating Co., PSD Appeal No. 05-05, 13 E.A.D. 1, 2006 EPA App. LEXIS 38 (EAB Aug. 24, 2006), at slip op. 44-71; see also In re Desert Rock Energy Co., 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 114 (“In *Prairie State* . . . petitioners challenged the permit issuer’s failure to consider an alleged potential control option in step 1 of the BACT analysis.”).*

121. The court noted an apparent exception to this principle: “EPA does not require a . . . [permit] applicant to change the fundamental scope of its project . . . unless the applicant intentionally designs the plant in a way calculated to make measures for limiting the emission of pollutants ineffectual.” *Sierra Club*, 499 F.3d at 654 (emphasis added).

a nuclear plant rather than a coal-fired one, or could order it to explore the possibility of damming the Mississippi to generate hydroelectric power, or to replace coal-fired boilers with wind turbines. That approach would invite a litigation strategy that would make seeking a permit for a new power plant a Sisyphean labor, for there would always be one more option to consider. The petitioners to their credit shy away from embracing the extreme implications of such a strategy, which would stretch the term control technology beyond the breaking point . . . . But they do not suggest another stopping point.

Now it is true that a difference between this case and our nuclear hypothetical is that a plant designed to burn coal cannot run on nuclear fuel without being redesigned from the ground up, whereas Prairie State's proposed plant could burn coal transported to the plant from afar. But to convert the design from that of a mine-mouth plant to one that burned coal obtained from a distance would require that the plant undergo significant modifications—concretely, the half-mile-long conveyor belt, and its interface with the mine and the plant, would be superfluous and instead there would have to be a rail spur and facilities for unloading coal from rail cars and feeding it into the plant.

So it is no surprise that the EPA, consistent with our nuclear hypothetical and the petitioners' concession regarding it, distinguishes between control technology as a means of reducing emissions from a power plant or other source of pollution and redesigning the proposed facility (the plant or other source)—changing its fundamental scope. . . .

But this opens the further and crucial question where control technology ends and a redesign of the proposed facility begins. As it is not obvious where to draw that line either, it makes sense to let the EPA, the author of the underlying distinction, draw it, within reason.<sup>122</sup>

The pivotal sentence in the court's analysis is the one in which it declares that a conversion from a mine-mouth plant to one receiving coal obtained from a distance "would require that the plant undergo significant modifications."<sup>123</sup> The court is here discussing the delivery method for a commonly used fuel: coal. That fuel can be delivered by

a conveyor belt from an adjacent mine or can be delivered from afar, presumably by rail car. Once received within the plant, coal is coal, and there would be no difference in the manner of handling it beyond the delivery point.

If the court can be faulted for its otherwise lucid opinion, the weakness in its reasoning lies in the court's willingness to accept EPA's conclusion that a change in the delivery method for the fuel would represent such a significant modification of the facility as to require a redesign:

[EPA] granted the permit not because it thinks that burning low-sulfur coal would require the redesign of Prairie State's plant (it would not), but because receiving coal from a distant mine would require Prairie State to reconfigure the plant as one that is not co-located with a mine, and this reconfiguration would constitute a redesign. So the Board's ruling on the BACT issue must be upheld.<sup>124</sup>

The Seventh Circuit's opinion effectively endorsed EPA's position that a BACT standard altering the delivery method for a facility's fuel would inappropriately require redesign of the plant. Given the massive design changes routinely required for such control technologies as baghouse filters and electrostatic precipitators, the notion that the delivery method for receiving a facility's fuel is something within the sole control of the applicant is rather startling.

Moreover, the *Sierra Club* opinion provides an open invitation to site all high-sulfur coal-burning facilities sufficiently near the raw coal to permit delivery of the fuel via conveyor belt, thus ruling out the consideration of low-sulfur coal. Particularly after the publication of this decision, one could argue that any utility deliberately siting a proposed facility in this manner would be "intentionally design[ing] the plant in a way calculated to make measures [a low-sulfur coal BACT standard] for limiting the emission of pollutants ineffectual."<sup>125</sup>

It would be one thing for EPA to consider the cost differential between mine-mouth coal and low-sulfur coal during Step 4 of the top-down process; after all, the statutory BACT definition does instruct the decisionmaker to take into account "economic impacts and other costs."<sup>126</sup> It is quite another thing, however, for the Agency to take the position that the low-sulfur coal option can be ignored entirely because the permit applicant wishes to use a fuel located adjacent to the proposed facility—a fuel essentially identical in its combustion properties to an alternative fuel that would significantly reduce emissions of a regulated pollutant and which would require no redesign whatsoever of the facility's post-delivery handling.

## F. The Limited Nature of the *Sierra Club* Ruling

The Seventh Circuit's *Sierra Club* ruling said only that EPA's conclusion eliminating the low-sulfur coal option from Step 1 of the top-down analysis when dealing with a specific per-

122. *Sierra Club*, 499 F.3d at 655. The Court went on to say:

Suppose this were not to be a mine-mouth plant but Prairie State had a contract to buy high-sulfur coal from a remote mine yet could burn low-sulfur coal as the fuel source instead. Some adjustment in the design of the plant would be necessary in order to change the fuel source from high-sulfur to low-sulfur coal . . . but if it were no more than would be necessary whenever a plant switched from a dirtier to a cleaner fuel the change would be the adoption of a control technology. Other-wise clean fuels would be read out of the definition of such technology. At the other end of the spectrum is our nuclear hypothetical. The plant proposed in this case falls between that hypothetical example and the example of a plant that has alternative off-site sources of high- and low-sulfur coal respectively.

We hesitate in a borderline case, such as this, to pronounce the EPA's decision arbitrary, the applicable standard for judicial review of its granting the permit.

*Id.* at 656.

123. *Id.* at 655.

124. *Id.* at 656.

125. See *supra* note 121.

126. CAA §169(3), 42 U.S.C. §7479(3).

mit application was not arbitrary or capricious. The court did not forbid consideration of low-sulfur coal in future cases or even in the case before it.<sup>127</sup> Moreover, the *Sierra Club* case involved a facility designed to employ a fuel source situated at the very location of the proposed facility.

In a subsequent case, EPA's EAB insisted that low-sulfur coal must be considered as a Step 1 option when determining BACT for a facility that proposed to limit its coal use to fuels available from two nearby locations:

[A]lthough the record reflects that other coal, relative to Marquette and Presque Isle coal, will produce the lowest sulfur emissions, MDEQ [the Michigan Department of Environmental Quality] proceeds without explaining why these sources are unavailable or not technically feasible. . . .

Had it come after careful and detailed consideration . . . or been attentive to [appropriate] technology or methods . . . MDEQ's unqualified declaration that [c]oal will be obtained from Marquette or Presque Isle might have withstood scrutiny. . . . But all indications are otherwise, suggesting a fixed, preselected outcome, or at least one never subjected to serious examination. . . .

The record is silent as to why other coal sources, whether more distant or more proximate, were not considered. This gap is particularly troubling on a record that spotlights at least two coal-fired, lower sulfur-polluting facilities, both employing low sulfur coal or other low sulfur emission technological features apparently achievable but inexplicably rejected for the [proposed] facility. . . .

MDEQ's assertion that a different coal source constitutes impermissible redefining is unpersuasive and not supported by the record.

[T]he CAA promotes clean fuels with particular vigor. . . . Merely equating use of lower polluting fuels to impermissible redesign in the hope of paving an automatic BACT off-ramp pointedly frustrates congressional will. . . .

Too late and on too meager a record, MDEQ attempts to inject the specter of major redesign. Its brief pushes forward entirely new theories—transport difficulties, stockpile . . . and [boiler] feed problems—that it claims amount to redesign or redefining the source were non-Marquette or non-Presque Isle coal forced upon it. . . . But the record before us does not sustain such claims. The documentary trail offers no basis to conclude that any fundamental design change, or any source or facility design change whatsoever, would result were [the proposed facility] . . . to burn lower sulfur non-Marquette or -Presque Isle coal. No data show the CFB boiler incapable of burning coal from other sources. . . . No facility diagram or other reason tells why storage space designated exclusively for Marquette and Presque Isle coal cannot make way for

non-Marquette or -Presque Isle coal, or why storage areas for additional non-Marquette and -Presque Isle coal is not feasible. Nor does MDEQ put before us any documentation that delivery of non-Marquette or -Presque Isle coal would work some harm, or force some change, to the basic facility design.<sup>128</sup>

It seems clear from the *Northern Michigan University* case that permit applicants cannot count on the argument that low-sulfur coal should be ignored when compiling the top-down Step 1 list. The Seventh Circuit's *Sierra Club* case, despite its importance, may have limited applicability to other fact patterns.

### G. *Would Substituting IGCC for Pulverized Coal Redefine the Source?*

In addition to the low-sulfur coal issue, EPA has struggled with the problem of how to address IGCC technology when determining BACT for proposed pulverized coal-burning facilities.<sup>129</sup> The EPA EAB has explained the difference in the two technologies:

In a typical pulverized coal combustion-based electric generating facility . . . coal is burned to create heat, which is used to boil water, creating steam that drives a steam turbine power generator. . . . IGCC, on the other hand . . . uses coal, but in an initial gasification part of the process, the coal is chemically converted into a synthetic gas (syngas). . . . The syngas is cleaned to remove various pollutants, such as particulate matter, mercury, sulfur compounds, ammonia, and other acid gases, and is then burned in a gas turbine to generate electric power. . . . Heat is recovered from the gas turbine and the gasification process and is then used to produce additional power using a steam turbine. . . . Thus . . . IGCC is not simply an add-on emissions control technology, but instead requires a differently designed power block.<sup>130</sup>

IGCC technology is much more efficient than pulverized coal plants, produces lower carbon dioxide (CO<sub>2</sub>) emissions, and creates a concentrated CO<sub>2</sub> emissions stream that may be more easily captured for underground storage (carbon sequestration) to prevent the gas from being added to the atmosphere.<sup>131</sup>

PSD permit applicants have argued that replacing pulverized coal with IGCC technology would require a rede-

127. EPA does not interpret the CAA to prohibit redefinition of a source, and has expressly stated that states are free to establish BACT standards redefining a source if they wish to do so. See *supra* note 107.

128. In re Northern Michigan University Ripley Heating Plant, PSD Appeal No. 08-02, 2009 WL 443976, 2009 EPA App. LEXIS 5 (EAB Feb. 18, 2009), at slip op. 37, 44-45, 47, 50-52.

129. See 40 [Curr. Dev.] Env't. Rep. (BNA) 304 (2009) (the "argument that the BACT analysis should include evaluation of the IGCC process is commonly raised in challenges to coal plants").

130. In re Desert Rock Energy Co., 2009 WL 3126170, 2009 EPA App. LEXIS 28 (EAB Sept. 24, 2009), at slip op. 106-07.

131. See 41 [Curr. Dev.] Env't. Rep. (BNA) 266 (2010); *id.* at 179. See also Bradford C. Mank, *Standing and Global Warming: Is Injury to All Injury to None?*, 35 ENVTL. L. 1, 11 n.50 (2005) ("An IGCC plant would gasify coal and process it to remove acidic and particulate matter, including 90-95% of all metals including mercury.").





Deciphering which control strategies would result in the redefinition of a proposed facility requires a case-by-case analysis in which the difference between the strategies accepted and those rejected is often a matter of degree. For example, a proposed waste combustion facility was not required to consider as part of its BACT analysis disposing of the waste by burning in existing electricity-generating facilities. *In re Pensauken County Res. Recovery Facility*, 2 E.A.D. 667 (1988). The adoption of this alternative process would not only redefine the proposed facility but would negate the need for the waste combustion facility altogether. In comparison, the use of clean fuels, a control strategy identified by the BACT definition, presents a closer question. . . .

As illustrated by the Illinois mine-mouth cases, the purpose of a proposed facility is determined by the description in the application submitted for the proposed facility, so long as the purpose or design is objectively discernable. . . . We emphasize that the purpose of the project must be objective and must focus on the overall business purpose for the proposed facility. We are wary of the risk of applicants describing a project in such a limited manner that they are able to circumvent the goals of BACT, which include encouraging the use of new technologies. . . . Thus, when considering what design elements are inherent to the project, cost and avoidance of the risks associated with adopting new technologies cannot support what is considered fundamental to a project's design. . . . Instead, the fundamental aspects must relate to the basic business purpose of the proposed facility.

Applying our holding to the facts of this case, we conclude that considering IGCC would not require the Power Company to redefine the design of its proposed facility. . . . [T]he basic design of the Power Company's proposed facility is an electric power generating plant fueled by coal. With this purpose, it is evident that the Power Company was not required to consider wind generation for electric power as an alternative process. However . . . the

Power Company should have included IGCC in its BACT review. IGCC is a control technology that can reduce the emissions of several criteria pollutants. The adoption of this standard would not require the Power Company to redefine the design of its proposed facility. The facility would still remain an electric power generating plant fueled by coal. We note that the consideration of IGCC in the BACT review does not compel its adoption; instead, it only requires the Power Company to subject IGCC to the five-step top down analysis used to determine the best available technology.<sup>139</sup>

#### H. *The Fluid Nature of the Source Redefinition Policy*

It is clear from the foregoing discussion that the appropriateness of considering IGCC technology during BACT analysis is still in a state of flux, but that EPA itself is moving toward the position that IGCC technology cannot be omitted in compiling the Step 1 list for a pulverized coal facility.

One additional case suggests that the Agency may be moving even further in shrinking the effect of the source redefinition doctrine. In a December 2010 order involving the proposed Cash Creek facility in Kentucky—a facility designed from the outset to use IGCC technology—EPA objected that the state reviewing authority had “failed to explain why it excluded natural gas as an alternative fuel” in its BACT analysis.<sup>140</sup> The Cash Creek order suggests “a progression in which EPA is requiring gasification to be considered as BACT for pulverized coal plants and natural gas to be considered as BACT for gasification plants.”<sup>141</sup> An attorney for energy company clients characterized the progression as one in which “EPA is trying to force a finding that burning coal is not allowed under the Clean Air Act.”<sup>142</sup>

*This Article will continue in next month's issue of News & Analysis.*

139. *Utah Chapter*, 226 P.3d at 733.

140. *See* 41 [Curr. Dev.] Env't. Rep. (BNA) 266 (2010):

According to EPA, because the proposed plant would burn natural gas as a backup fuel and during startup, the state needed to show why it could not just use natural gas as its primary fuel [and] also needed to show why it believes that requiring the use of natural gas would fundamentally redefine the source.

141. *Id.*

142. *Id.* (attributing this view to Richard Alonso, an attorney at Bracewell & Giuliani).