
(Slip Opinion)

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**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.**

In re:)
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)
Steel Dynamics, Inc.) PSD Appeal Nos. 99-4
) & 99-5
PSD Permit No. CP-183-10097-00030)
)

[Decided June 22, 2000]

***ORDER GRANTING REVIEW IN PART
AND DENYING REVIEW IN PART***

***Before Environmental Appeals Judges Scott C. Fulton,
Ronald L. McCallum, and Kathie A. Stein.***

STEEL DYNAMICS, INC.

PSD Appeal Nos. 99-4 & 99-5

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AND DENYING REVIEW IN PART***

Decided June 22, 2000

Syllabus

Petitioners United Association of Plumbers and Steamfitters, Local Union 166 (“Union”) and Citizens Organized Watch (“COW”) filed petitions for review of a Prevention of Significant Deterioration (“PSD”) permit issued by the Indiana Department of Environmental Management (“IDEM”) to Steel Dynamics, Inc. (“SDI”) for the construction of a new steel mill in Whitley County, Indiana. Petitioners raise a multitude of procedural and substantive challenges to the terms of SDI’s permit. The U.S. Environmental Protection Agency’s (“EPA”) Office of General Counsel and Office of Regional Counsel for Region V, on behalf of EPA’s Office of Air and Radiation and Region V, join petitioners, in several instances, in arguing that the permit should be remanded to IDEM for further consideration, while in many other instances they urge that review should be denied.

Held: The Environmental Appeals Board (“Board”) denies review of the clear majority of issues raised by petitioners (see bulleted lists below). However, the Board finds, in three instances, that the permit should be remanded.

First, the Board remands the permit so that IDEM may reconsider its best available control technology (“BACT”) determination for nitrogen oxide (“NO_x”) emissions from the mill’s reheat furnace. Petitioners, supported by EPA, raised significant questions about IDEM’s technical and economic analyses of the available pollution control options and argued that selective catalytic reduction (“SCR”) technology should have been selected as BACT rather than the combustion controls chosen by IDEM. The Board finds that IDEM failed to conduct an adequate cost-effectiveness analysis of SCR technology. IDEM must perform a thorough cost-effectiveness analysis, document its findings, submit those findings to public review, and consider and respond to significant public comments in its documentation of the final permit decision. *See* Part II.B.3.

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Second, the Board remands the permit so that IDEM may reconsider the form of the BACT limitations chosen for NO_x and carbon monoxide (“CO”) emissions from the electric arc furnace (“EAF”). IDEM imposed hourly emissions limits, in pounds per hour, for these pollutants, rather than either production limits (in pounds per ton or pounds per MMBtu) and hourly limits or production limits alone, as was done at fifteen similar steel mills across the country. Petitioners and EPA argued that both hourly and production limits are needed to ensure that emissions are controlled regardless of the production rate or operational conditions at the facility. Thus, IDEM must justify its choice of the form of the limits or impose production limits in addition to the hourly limits for these pollutants. *See* Part II.C.2.

Third, the Board remands the permit so that IDEM may reconsider its analysis of the proposed steel mill’s potential to emit lead. Although IDEM concluded that the mill need not install BACT to control emissions of lead because the projected lead levels fell below the applicable significance level for the PSD program (i.e., 0.6 tons of lead per year), IDEM’s conclusion was based on data that were not contained in the administrative record. Accordingly, the Board is unable to determine whether or not the significance level for lead would be exceeded and, thus, whether BACT for lead should be installed at this facility. In addition, IDEM failed to consider the Union’s detailed alternative calculation of the mill’s potential to emit lead. *See* Part II.A.

Review of all other issues is denied. In brief, the Board finds that petitioners failed to establish clear error or an abuse of discretion on the part of IDEM in its analysis and treatment of:

- BACT for particulate matter (“PM”) emissions from the EAF, *see* Part II.B.1.a.-c (findings summarized as follows):
 - No showing by petitioners that technologies other than baghouses are potential options for control of condensible PM at this facility;
 - Petitioners’ stack test evidence showing actual filterable PM emissions lower than the limit established in SDI’s permit is not enough, without more information, to overcome IDEM’s use of fifteen BACT determinations from steel mills to set the filterable PM limit; and
 - IDEM’s failure to explain in the administrative record its choice of total PM emissions limit is not clearly erroneous where other information in record is adequate to deduce rationale behind limit and conclude that IDEM applied considered judgment in setting limit.

- BACT for NO_x emissions from the EAF, *see* Part II.B.2 (IDEM's original BACT analysis (in which it selected low-NO_x/oxyfuel burners as BACT in this context) and response to comments contain reasonably detailed summaries of the technical and environmental hurdles raised by the potential application of SCR in this context; moreover, petitioners failed to rebut IDEM's analysis in any of its particulars);
- The technical feasibility component of the BACT analysis for NO_x emissions from the reheat furnace, *see* Part II.B.3.b.i (complexity of issue and fact that IDEM found SCR to be economically infeasible forestall remand on this ground; however, absent definitive decision on this matter on remand, Board will presume SCR is technically feasible);
- BACT for PM emissions from the slag-handling area, *see* Part II.B.4.a-c (findings summarized as follows):
 - IDEM evaluated all options timely brought to its attention and documented its findings in the record;
 - Costs of constructing and maintaining complete enclosure of slag-dumping area with baghouse are facially much more expensive than outdoor, nearly as efficacious, water-based controls, and thus IDEM did not err by failing to specify all information petitioners seek; and
 - Petitioners' contention that IDEM underestimated PM emissions from slag-handling operations fails where arguments are based on outdated and incomplete information.
- Enforceability of NO_x limits imposed on nine separate heaters, preheaters, and dryers that all vent to a single stack, *see* Part II.C.1.b (petitioners failed to rebut general understanding that low-NO_x burners should easily achieve the BACT limit for these sources, so IDEM's failure to require specific compliance testing for the units is not clear error);
- Enforceability of a single pounds-per-hour limit for emissions of sulfur dioxide ("SO₂") from the EAF, *see* Part II.C.2 (sulfur-related conditions in permit -- i.e., annual stack tests and vendor certifications of sulfur content in raw materials -- and fact that BACT for SO₂ is no control alleviate concern about SO₂ emissions exceeding the BACT limit at any given rate of production);
- Enforceability of raw material sulfur limits, *see* Part II.C.3 (restatement on appeal of charges made during comment period, without any information or

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arguments to rebut the explanations provided in the response to comments, is not sufficient to grant review);

- Enforceability of conditions imposed to regulate PM emissions from the slag-handling area, allegedly in absence of daily slag production limits and recordkeeping requirements, continuous fenceline opacity monitoring, and public review of slag enclosure design specifications, *see* Part II.C.5 (no supportable reason to question IDEM's technical judgment in this regard);
- Enforceability of permit conditions for fugitive dust emissions from transportation activities on paved and unpaved roadways at the mill, *see* Part II.C.6 (petitioners failed to demonstrate that their monitoring proposal was preferable to that selected by IDEM);
- Enforceability of limits on EAF emissions of NO_x, SO₂, and PM allegedly in absence of specified averaging times and sampling durations, *see* Part II.C.7 (petitioners offered no evidence that stack test durations of at least one hour or tap-to-tap runs of ninety minutes are inadequate to obtain reasonable assessment of facility performance);
- Enforceability of Preventive Maintenance Plan requirements, *see* Part II.C.9 (petitioners failed to rebut IDEM's explanations in the response-to-comments document);
- Soil and vegetation impacts analysis, *see* Part II.D.1 (petitioners have provided no information that contradicts IDEM's conclusion that the proposed mill will not adversely affect soils and vegetation in the area); and
- Several other miscellaneous issues, *see* Part II.D.3.

Moreover, the Board finds that petitioners failed to preserve for review on appeal their arguments, in part or in full, regarding:

- A number of purportedly available control options suggested as BACT for PM emissions from the slag-handling area, *see* Part II.B.4.a;
- Enforceability of NO_x limits imposed on the ladle metallurgy refining station and the continuous caster, both of which vent, along with the EAF, to the EAF baghouse stack, *see* Part II.C.1.a;

- Enforceability of single pounds-per-MMBtu limit for emissions of NO_x and CO from the reheat furnace and of NO_x from the heaters, preheaters, and dryers, *see* Part II.C.2;
- Enforceability of emissions limits on NO_x and SO₂ emissions from the EAF and on NO_x emissions from the reheat furnace, in the absence of a requirement that SDI install continuous emissions monitors, *see* Part II.C.4;
- Enforceability of conditions imposed to regulate PM emissions from the slag-handling area, in absence of limitations on slag area's potential to emit PM, *see* Part II.C.5; and
- Enforceability of limits on EAF emissions of NO_x, SO₂, and PM in absence of prespecified stack test methods and conditions and public review thereof, *see* Part II.C.7.

The Board also finds that petitioners failed to present, with sufficient specificity to warrant review, arguments regarding alleged procedural errors in the public notice and comment process. *See* Part II.C.2. Finally, the Board exercises its discretion not to decide petitioners' contentions with respect to:

- Alleged procedural errors in IDEM's handling of information pertaining to BACT for NO_x emissions from the reheat furnace, *see* II.B.3.a; and
- Enforceability of limit on emissions of lead from the EAF, which the Board finds may be rendered moot on remand of the lead BACT issue, *see* II.C.8.

Before Environmental Appeals Judges Scott C. Fulton, Ronald L. McCallum, and Kathie A. Stein.

Opinion of the Board by Judge Stein:

On July 7, 1999, the Indiana Department of Environmental Management ("IDEM" or "Department") issued a federal prevention of significant deterioration ("PSD") permit, pursuant to Clean Air Act ("CAA") § 165, 42 U.S.C. § 7475, to Steel Dynamics, Inc. ("SDI") for the construction and operation of a new steel beam mill in Whitley County, Indiana. IDEM is authorized to make PSD permitting decisions

for new and modified stationary sources of air pollution in Indiana pursuant to a 1981 delegation agreement with Region V of the U.S. Environmental Protection Agency (“EPA” or “Agency”). *See* 40 C.F.R. § 52.21(u); 46 Fed. Reg. 9580, 9583-84 (Jan. 29, 1981). Because IDEM acts as EPA’s delegate under the PSD program, IDEM’s PSD permits are considered EPA-issued permits, and appeals of the permit decisions are heard by the Environmental Appeals Board (“Board”) pursuant to 40 C.F.R. § 124.19. *See In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 2 n.1 (EAB, Sept. 10, 1998), 8 E.A.D. ____.

In this case, two parties -- the United Association of Plumbers and Steamfitters, Local Union 166 (“Union”), and Citizens Organized Watch (“COW”) -- filed appeals of IDEM’s permit decision for SDI, requesting on numerous grounds that the permit be remanded to the Department for further consideration. In addition, EPA’s Office of General Counsel and the Office of Regional Counsel for Region V, on behalf of EPA’s Office of Air and Radiation and Region V, filed friend of the court briefs, also requesting remand of the PSD permit on several of the grounds raised by petitioners. IDEM and SDI filed responsive briefs supporting the permit decision. Briefing was completed on December 20, 1999.

The numerous issues raised in this case are, for the most part, procedurally, factually, and technically complex. The Board carefully evaluated approximately 400 pages of submitted legal briefs and hundreds of pages of technical documentation and exhibits in reaching its decision. For the reasons set forth below, we deny review on the clear majority of issues raised. However, we also conclude that petitioners have met the burden of showing that review of three issues is warranted, and that the permit should be remanded to IDEM for further action on those issues consistent with this opinion.¹

¹Due to the extensive briefing of these issues on appeal to date, further briefing would not be helpful. *See In re Renkiewicz SWD-18*, 4 E.A.D. 61, 67 n.5 (EAB 1992)

(continued...)

The three issues that merit review are, first and foremost, IDEM's best available control technology ("BACT") analysis for emissions of nitrogen oxides from the proposed steel mill's reheat furnace. Petitioners, supported by EPA as friend of the court, raised significant questions about IDEM's technical and economic analyses of the available pollution control options and argued that selective catalytic reduction technology should have been selected as BACT rather than the combustion controls chosen by IDEM. Second, petitioners, again supported by EPA, argued that IDEM erroneously imposed only hourly limits on the proposed mill's electric arc furnace emissions of carbon monoxide and nitrogen oxides. These parties argued that both hourly and production limits were needed at this facility to ensure that emissions are controlled regardless of the production rate or operational conditions at the facility. We have remanded the permit for further explanation and action on IDEM's part regarding the forms of these limits. Finally, although IDEM concluded that the plant need not install BACT to control emissions of lead because the projected lead levels fell below the applicable significance level for the PSD program, IDEM's conclusion was based on data that were not contained in the administrative record. Accordingly, we are unable to determine whether or not the significance level for lead would be exceeded and thus whether BACT for lead should be required at this facility.

We do not lightly decide to remand a portion of this permit, as we are mindful of the importance of resolving PSD permits expeditiously and of the fact that a remand will further lengthen the permit issuance process. Nonetheless, we remain convinced that a remand here is the appropriate outcome. These are important issues that may materially affect the quality of environmental protection in the area surrounding this

¹(...continued)

("Although § 124.19 * * * contemplates that additional briefing will be submitted upon the grant of a Petition for Review, a direct remand without additional submissions is appropriate where, as here, it does not appear that further briefs on appeal would shed light on the issues to be addressed on remand.").

facility. We are influenced by the strength of the technical presentation made to us not only by petitioners, but also importantly by EPA who as friend of the court has expressed serious concerns to us about several aspects of this permit. Although we recognize that IDEM as the permit issuer is deserving of deference, especially with respect to areas involving its technical expertise, EPA's views on technical issues also carry significant weight.² We must be satisfied that the decisionmaker fully took into account the conflicting expert opinions and that the approach selected in the final permit is both rational and supportable in this light.

I. BACKGROUND

A. Statutory and Regulatory Background

Congress enacted the PSD provisions of the CAA in 1977 for the purpose of, among other things, “insur[ing] that economic growth will occur in a manner consistent with the preservation of existing clean air resources.” CAA § 160(3), 42 U.S.C. § 7470(3). To that end, parties must obtain preconstruction approval (i.e., PSD permits) to build new major stationary sources, or to make major modifications to existing sources, in areas of the country deemed to be in “attainment” or “unclassifiable” with respect to federal air quality standards called “national ambient air quality standards” (“NAAQS”). *See* CAA §§ 107, 160-169B, 42 U.S.C. §§ 7407, 7470-7492.

NAAQS are established on a pollutant-by-pollutant basis and are currently in effect for six air contaminants: sulfur oxides (measured as sulfur dioxide (“SO₂”)), particulate matter (“PM”), carbon monoxide (“CO”), ozone (measured as volatile organic compounds (“VOCs”)), nitrogen dioxide (“NO₂”), and lead. 40 C.F.R. § 50.4-.12. In areas

²In keeping with the deference accorded the permit issuer, we have, in numerous other instances, concluded that there was no clear error or abuse of discretion in the judgments exercised by IDEM, including on issues where EPA expressed a contrary view.

deemed to be in “attainment” for any of these pollutants, air quality meets or is cleaner than the NAAQS for that pollutant. CAA § 107(d)(1)(A)(i), 42 U.S.C. § 7407(d)(1)(A)(i); *In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 5 (EAB, Sept. 10, 1998), 8 E.A.D. _____. In “unclassifiable” areas, air quality cannot be classified on the basis of available information as meeting or not meeting the NAAQS.³ CAA § 107(d)(1)(A)(iii), 42 U.S.C. § 7407(d)(1)(A)(iii).

Applicants for PSD permits must demonstrate, through analyses of the anticipated air quality impacts associated with their proposed facilities, that their facilities’ emissions will not cause or contribute to an exceedence of any applicable NAAQS or air quality “increment.”⁴ CAA § 165(a)(3), 42 U.S.C. § 7475(a)(3); 40 C.F.R. § 52.21(k)-(m). In addition, applicants for PSD permits must employ the “best available control technology,” or “BACT,” to minimize emissions of pollutants that may be produced by the new source in amounts greater than applicable

³Areas may also be designated as “nonattainment,” meaning that the concentration of a pollutant in the ambient air exceeds the NAAQS for that pollutant. CAA § 107(d)(1)(A)(ii), 42 U.S.C. § 7407(d)(1)(A)(ii). The PSD program is not applicable, however, in nonattainment areas. *See* CAA § 161, 42 U.S.C. § 7471.

⁴Air quality increments represent the maximum allowable increase in concentration that may occur above a baseline ambient air concentration for a pollutant. *See* 40 C.F.R. § 52.21(c) (increments for six regulated air pollutants).

“significance” levels established by the PSD regulations.⁵ CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j)(2).

The BACT requirement, which is of substantial importance to this appeal, is defined in the regulations as follows:

[BACT] means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under [the] Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

40 C.F.R. § 52.21(b)(12); *accord* CAA § 169(3), 42 U.S.C. § 7479(3). As the Board has noted on prior occasions, “[t]he requirements of preventing violations of the NAAQS and the applicable PSD increments, and the required use of BACT to minimize emissions of air pollutants, are the core of the PSD regulations.” *In re Encogen Cogeneration*

⁵The significance levels are as follows:

POLLUTANT	SIGNIFICANCE LEVEL
CO	100 tons per year (“tpy”)
NO ₂	40 tpy
SO ₂	40 tpy
PM	15 tpy
ozone(as VOCs)	40 tpy
lead	0.6 tpy

40 C.F.R. § 52.21(b)(23).

Facility, PSD Appeal Nos. 98-22 to -24, slip op. at 5 (EAB, Mar. 26, 1999), 8 E.A.D. ____; *accord In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 11 (EAB, Nov. 25, 1998), 8 E.A.D. ____.

B. Factual and Procedural Background

On September 2, 1998, SDI filed an application with IDEM for permission to construct a new steel beam mill consisting of two electric arc furnaces (“EAFs”), a ladle metallurgy refining station (“LMS”),⁶ various natural gas-fired preheaters and dryers, a continuous caster, a reheat furnace,⁷ a slag-handling and -processing area, storage silos, a cooling tower, and associated equipment and transportation facilities. *See* IDEM Office of Air Management, PSD Construction Permit for Steel Dynamics, Inc. § A.2 (July 7, 1999) (“Permit”); IDEM Office of Air Management, Technical Support Document for New Construction and Operation, Steel Dynamics, Inc. app. C (Mar. 14, 1999) (“TSD”). The proposed mill is expected to produce molten steel at a maximum rate of 200 tons per hour. Permit § A.2.

⁶As IDEM explained in the technical support document for the proposed permit:

Molten metal in the EAF will be tapped into ladles and transported by electric overhead traveling cranes to the [LMS]. At the LMS, a sample of the molten steel will be taken and analyzed for its various constituents. Additional alloying materials may be added to meet the required product specifications. After the alloy addition, the molten metal will be stirred and reheated in the ladle by electrodes.

IDEM Office of Air Management, Technical Support Document for New Construction and Operation, Steel Dynamics, Inc. app. B at 19 (Mar. 14, 1999) (“TSD”).

⁷Steel is processed through the reheat furnace in preparation for rolling; the furnace is used to attain the optimal temperature for rolling each shape/thickness of steel. *See* TSD app. B at 23.

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The portion of Whitley County, Indiana in which SDI's new mill will be sited is designated as attainment or unclassifiable for SO₂, CO, NO₂, PM₁₀, and ozone (VOCs).⁸ 40 C.F.R. § 81.315. As currently configured, the mill has the potential to emit all of these pollutants in quantities sufficient to trigger the protections of the PSD program, TSD app. C, pt. A, which necessitated SDI's PSD permit application.

In response to SDI's application, IDEM initiated a course of action designed to encourage public participation in the permit decisionmaking process. *See In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 5 (EAB, Feb. 4, 1999), 8 E.A.D. ____ (CAA "emphasizes the importance of public participation and input into the decisionmaking process"). On March 14, 1999, IDEM solicited public comments on its proposal to issue a PSD permit for SDI's steel mill. IDEM received comments from a number of parties, including the Union, COW, and EPA Region V. After extending the comment period for thirty days, until May 14, 1999, IDEM revised the draft permit and issued it in final form on July 7, 1999, along with a document responding to the comments on the proposed permit. *See Permit; IDEM Office of Air Management, Addendum to the Technical Support Document for New Construction and Operation, Steel Dynamics, Inc. (July 7, 1999) ("ATSD") (response-to-comments document).*

On August 6, 1999, the Union filed PSD Appeal No. 99-4 with this Board, and on August 9, 1999, COW filed PSD Appeal No. 99-5.

⁸Whitley County has no designation for lead. 40 C.F.R. § 81.315. IDEM asserts, however, that the County has been classified as attainment or unclassifiable for lead. TSD at 4. In any case, the proposed steel mill must comply with PSD requirements for lead provided it has the potential to emit lead in amounts greater than or equal to the significance level. *See U.S. EPA, Office of Air Quality Planning & Standards, New Source Review Workshop Manual at A.31 (draft Oct. 1990) (major source with significant emissions of a regulated pollutant in area not classified as nonattainment is subject to PSD review for that pollutant).* The issue of whether the facility has the potential to emit lead in quantities greater than or equal to the significance level is a matter of considerable dispute and is discussed *infra* Part II.A.

See Petition of the United Association of Plumbers and Steamfitters, Local Union 166, and Its Members (“Union Pet’n); Petition of Citizens Organized Watch, Inc. (“COW Pet’n”). At the request of the Board, IDEM provided a response to the petitions for review, and the Board granted SDI leave to file its own response to the petitions. *See* IDEM’s Response to Petitions of the Union and COW (“IDEM Resp.”); SDI’s Consolidated Response to Petitions for Review (“SDI Resp.”). The Board then granted EPA’s Office of General Counsel and Office of Regional Counsel for Region V’s (collectively, “Amici”) request to file an *amicus curiae* brief responding to the two petitions and IDEM’s response, as well as Amici’s subsequent supplemental brief responding to SDI’s response. *See* Amicus Brief of EPA Region V & EPA Office of Air & Radiation (“Amicus Br.”); Supplemental Amicus Brief of EPA Region V & EPA Office of Air & Radiation. The Board also granted IDEM’s and SDI’s requests for leave to file separate replies to the *amicus* brief. *See* IDEM’s Response to Amicus Brief (“IDEM Reply”); SDI’s Response to Amicus Brief (“SDI Reply”). Finally, the Board granted the Union’s request to file a reply to IDEM’s, SDI’s, and Amici’s briefs and requested that Amici file a surreply to IDEM’s and SDI’s replies. *See* Union’s Reply Brief (“Union Reply”); Amicus Reply Brief (“Amicus Reply”). Briefing was completed on December 20, 1999.

II. DISCUSSION

Under the rules governing this proceeding, a PSD permit ordinarily will not be reviewed unless it is based on a clearly erroneous finding of fact or conclusion of law, or involves an important matter of policy or exercise of discretion that warrants review. *See* 40 C.F.R. § 124.19; 45 Fed. Reg. 33,290, 33,412 (May 19, 1980). The Board’s analysis of PSD permits is guided by the preamble to section 124.19, which states that the Board’s power of review “should be only sparingly exercised” and that “most permit conditions should be finally determined at the [r]egional [or state] level.” 45 Fed. Reg. at 33,412; *accord In re Kawaihae Cogeneration Project*, 7 E.A.D. 107, 114 (EAB 1997). The burden of demonstrating that review is warranted rests with the

petitioner, who must state his/her objections to the permit and explain why the permit issuer's previous response to those objections is clearly erroneous, an abuse of discretion, or otherwise warrants review. *In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 8 (EAB, Nov. 25, 1998), 8 E.A.D. ____; *Kawaihae*, 7 E.A.D. at 114; *In re EcoEléctrica, L.P.*, 7 E.A.D. 56, 60-61 (EAB 1997).

In the pages below, we begin by examining IDEM's alleged failure to conduct a BACT analysis for lead emissions from the proposed steel mill. Next, we address a number of challenges to various components of the BACT analyses that IDEM did conduct. Those challenges are centered on: (1) "condensable" and "filterable" PM emissions from the EAF; (2) NO_x emissions from the EAF; (3) NO_x emissions from the reheat furnace; and (4) PM emissions from the slag-handling area. We then turn our attention to nine instances in which petitioners claim SDI's permit conditions are not federally enforceable. Finally, we conclude by addressing a number of miscellaneous issues.

A. *Potential to Emit Lead: Potential BACT Review*

As mentioned above, PSD permitting authorities must establish emissions limits based on the best available control technology, or BACT, for each regulated pollutant the permittee has the potential to emit ("PTE")⁹ in significant amounts. 40 C.F.R. § 52.21(j)(2). Lead has a

⁹PTE is defined as:

[T]he maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

(continued...)

PSD significance level of 0.6 tons per year (“tpy”). *Id.* § 52.21(b)(23)(i). Accordingly, if a proposed source has a potential to emit lead in quantities greater than or equal to that number, an analysis of the BACT for lead must be conducted for that facility. *Id.* § 52.21(j)(2).

In this case, IDEM estimated the mill’s potential to emit lead as 0.45 tpy, assuming the presence of pollution controls and 8,760 hours of mill operation per year at rated capacity. TSD at 5. More specifically, IDEM estimated the EAF would emit 0.42 tpy of lead after controls, at a rate of 0.0005 pounds of lead per ton of steel produced, and the melt shop would emit 0.03 tpy of lead after controls, at a rate of 0.007 pounds of lead per ton of steel produced. *Id.* app. A at 1. Because its estimates showed the proposed mill’s PTE lead fell beneath the PSD significance level, IDEM did not conduct a BACT analysis for lead. *See id.* app. B. IDEM did not include explanations of the underlying basis for its lead calculations in the TSD, the ATSD, or any other document in the public record. However, in response to comments regarding lead emissions, IDEM did add a limit of 0.134 pounds per hour (or 0.59 tpy – just under the 0.6 tpy PSD significance level) for lead emissions from the EAF, as well as a requirement that SDI conduct a stack test after start-up to measure emissions of lead compounds. *See* Permit §§ D.1.11(a), D.1.15(d).

The Union challenges as clearly erroneous IDEM’s estimate of the proposed steel mill’s PTE lead, asserting that the emissions will be high enough to exceed the PSD significance level and that IDEM should have conducted a BACT analysis for lead. Union Pet’n at 7-8. More

⁹(...continued)

40 C.F.R. § 52.21(b)(4). In 1995, the U.S. Court of Appeals for the District of Columbia Circuit vacated the requirement that limitations be federally enforceable and remanded this regulation to EPA for reconsideration. *Chemical Mfrs. Ass’n v. EPA*, Nos. 89-1514 to -1516, 1995 WL 6500098, at *1 (D.C. Cir. Sept. 15, 1995) (citing *National Mining Ass’n v. EPA*, 59 F.3d 1351 (D.C. Cir. 1995)). EPA has not yet proposed a revised regulation, but according to Amici, in the interim EPA has recognized certain state-enforceable limits on PTE if those limits are shown to be effective. Amicus Br. at 5 n.2.

specifically, the Union filed extensive comments demonstrating the ways in which IDEM underestimated the mill's emissions of lead and other hazardous air pollutants ("HAPs"). *Id.* at 7. The Union commented, among other things, that IDEM erroneously failed to consider all potential sources of lead emissions, such as dryers, preheaters, and slag-processing activities, and erroneously excluded emissions of lead in "condensable" (as opposed to "filterable") form.¹⁰ Union Pet'n ex. 1, J. Phyllis Fox Comments at 1-4 ("Union/Fox Cmts"). The Union also argued that, to the extent IDEM relied on the quantity of dust generated by other EAFs ("EAF dust") to estimate the proposed mill's PTE lead, such reliance was erroneous because EAF dust is not a reasonable surrogate for actual stack emissions. *Id.* at 4-5 & tbl. 1. Finally, the Union pointed out that "[t]he basis of IDEM's lead emissions is not discussed in any of the materials [the Union's technical expert] reviewed." *Id.* at 4, 9.

As an alternative to IDEM's purportedly flawed estimation of the proposed mill's PTE lead, the Union calculated its own PTE estimate using actual stack test data compiled by Research Triangle Institute in 1993, under contract to EPA, for EAF steel manufacturing facilities from all across the nation. *Id.* at 6 & tbl. 1; Union Pet'n ex. 1-A, apps. A, F (Research Triangle Institute, *Detailed Summary of Information Collection Request Responses for Electric Arc Furnace (EAF) NESHAP* (Feb. 1, 1993)). The Union maintains that data from sixteen mills in the study show that, on average, 0.0046 tons of lead are emitted per ton of steel produced. Union/Fox Cmts at 9, 12 & tbl. 1. The Union concludes that, as applied to the proposed SDI mill (which has a

¹⁰Small particulates of lead suspended in the air can be measured in two forms: "condensable" particulates, which can be captured and measured using a condenser-type device, and "filterable" particulates, also known as "in-stack" or "noncondensable" particulates, which are captured and measured using a filter-type device. See 40 C.F.R. pt. 51, app. A, methods 201, 201A (filterable), 202 (condensable); see also *infra* Part II.B.1.

production rate of 200 tons of steel per hour), the PTE lead is, after controls, 4.03 tpy. *Id.*; *see* Union Pet'n at 7-8.

The Union claims that IDEM did not rebut this emissions estimate in its response to public comments on the proposed permit but, rather, accepted it. Union Pet'n at 8. Moreover, citing case law and EPA guidance, the Union argues that the 0.134 lb/hr (or 0.59 tpy) restriction IDEM placed on SDI's actual emissions of lead from the EAF is an invalid limit on PTE and without force or effect because it is not accompanied by production or operational requirements necessary to ensure compliance. *Id.* at 9-11. According to the Union, IDEM's decision to set the lead limit just below the BACT threshold was made specifically to circumvent PSD regulation. *Id.* at 9.

COW agrees that IDEM underestimated lead emissions and, as a result, erroneously failed to conduct a BACT analysis for lead emissions from the proposed steel mill. COW Pet'n at 4. COW also contends, as does the Union, that IDEM's decision to limit EAF emissions to 0.134 pounds per hour of lead cannot, without meaningful production or operational controls, shield the steel mill from the requirement that it undergo BACT review for lead. *Id.* at 15-16; Union Pet'n at 11. Accordingly, COW and the Union request that, on remand, the permit be conditioned to include production or operational requirements that will assure a limit of 0.134 pounds per hour is met, or, alternatively, that a lead BACT analysis be performed. COW Pet'n at 16; Union Pet'n at 11.

In its response to these petitions, IDEM begins by asserting that it did not accept the alternative emission factors proposed by the Union, as the Union alleged in its petition for review. IDEM Resp. at 5-6; *see* Union Pet'n at 8. IDEM explains that it imposed the emissions limit of 0.134 pounds per hour for two reasons: (1) to accommodate Region V's concern that fluctuations in the lead content of scrap metal could cause SDI to exceed its PTE of 0.45 tpy; and (2) because IDEM has no authority to restrict a non-PSD facility's (i.e., one whose PTE is less than the significance threshold) actual emissions. IDEM Resp. at 6. IDEM then criticized the Union's PTE analysis on several grounds. IDEM

asserts, among other matters, that the Union failed to provide data showing how condensible lead emissions -- which the Union claimed IDEM erroneously omitted -- should be factored into PTE calculations. *Id.* at 7. IDEM also asserts that the Union's PTE figure of 4.03 tpy is derived from "a wide range of generic sources." *Id.* at 8.

IDEM then explains for the first time on appeal that its own estimate of potential lead emissions was based on an EAF dust analysis of SDI's purportedly similar Butler, Indiana facility, which indicated a PTE of 0.26 tpy. IDEM states on appeal that it adjusted the 0.26 tpy estimate upward to account for condensible lead emissions, consistent with estimates done for other Indiana steel mills, and then verified the estimate using ambient monitoring data. *See id.* IDEM claims that this method of calculating the proposed steel mill's PTE lead is reasonable and that petitioners failed to demonstrate that IDEM's approach is clearly erroneous or involves an exercise of discretion or important policy matter warranting Board review.¹¹ *Id.*

¹¹For its part, SDI contends that IDEM "thoroughly investigated the Union's lead calculations and concluded that those numbers were wrong." SDI Resp. at 19. SDI claims that the Union used an "unreasonable" 0.0046 pounds per ton of steel to estimate lead emissions, which the Union asserted was derived from an EPA study but which, SDI contends, "was apparently created by cherry-picking 16 of the many reporting facilities" in the EPA report. *Id.* at 20 n.16.

A review of the Union's materials reveals the following basis for the 16 sources the Union used to estimate the proposed mill's PTE lead. The Union selected a group of 19 sources (16 nonstainless steel mills and 3 stainless steel mills) that had conducted stack testing specifically for metals. Of those 19 sources, 14 nonstainless steel mills and 2 stainless steel mills (for a total of 16 mills) reported results for lead. Other facilities included in the report conducted stack testing to determine total PM emissions and then engaged in EAF dust analysis to compute the metal fractions, while still other facilities performed no stack testing at all. These latter two groups of sources were not included in the Union's data set. *See* Union Pet'n ex. 1-A, apps. A, F (EAF NESHAP Report); Union Pet'n ex. 4, att. B.

Amici weigh in on the side of IDEM and SDI. Amici take the position that petitioners failed to show IDEM's PTE calculation to be clearly erroneous. Amicus Br. at 5-6. Amici note that, based on data IDEM proffered from SDI's Butler facility, IDEM estimated filterable lead emissions from the proposed mill's EAF to be 0.26 tpy. *Id.* at 6. Amici note further that IDEM added 0.19 tpy as an estimate for condensible lead emissions. Amici then assert that the record basis for IDEM's condensible estimate is "uncertain" but dismiss this concern by concluding that petitioners did not show IDEM's total lead estimate to be clearly erroneous. *Id.* Amici offer their own abbreviated analysis of condensible emissions, based on data provided by the Union and EPA studies, and conclude that condensible lead emissions "could range from 0.27 to 0.82 tpy," which means that total lead emissions "could range from 0.54 to 1.08 tpy."¹² *Id.* at 7. Amici then state that they are "concerned that [their] conservative estimate is so close to the significance threshold for lead, but [they] cannot say with certainty that SDI's total lead emissions will exceed this threshold." *Id.*

Amici also note that PTE is defined by regulation as a facility's maximum capacity to emit given its physical and operational design,

¹²As far as we can determine, Amici calculated these figures by adopting IDEM's 0.26 tpy estimate for filterable lead as its starting point. To compute the upper limits of their condensible and total lead estimates (i.e., 0.82 tpy condensible lead and 1.08 tpy total lead), Amici used the Union's highest estimate of the percentage of condensible PM in total PM, which was 76 percent. *See infra* Part II.B.1.a (discussing basis for Union's condensible PM estimates). To compute the lower limits of their condensible and total lead estimates (i.e., 0.27 tpy condensible lead and 0.54 tpy total lead), Amici used an estimate derived from EPA studies of PM, which found that condensible PM may comprise as much as 51 percent of PM emissions after controls. Amici Br. at 6 (citing, as source of 51 percent figure, *Compilation of Air Pollutant Emission Factors AP-42*, vol. I, chap. 12.5, Stationary Point and Area Sources (5th ed., Oct. 1986)).

The Union contends that Amici's total lead emissions estimates "confirm[] Petitioners' claim that actual lead emissions will exceed the PSD threshold of 0.6 [tpy]." Union Reply at 9 n.3.

which includes air pollution control equipment. *Id.* at 4. In this regard, according to Amici, the hourly emissions limit is not an essential ingredient of the permit because it is not needed to ensure the proposed mill's lead emissions remain beneath the significance level.¹³ *See id.* at 4-5, 7. Thus, Amici recommend that the Board deny review of the petitioners' challenge to the lead emissions limit. *Id.* at 4.

The Union replies to the arguments made by IDEM and SDI (and presumably also to many of the arguments made by EPA) by stating that "much of the information used to argue this issue is presented for the first time in IDEM's and SDI's briefs, and IDEM relies on new evidence not in the administrative record." Union Reply at 6. According to the Union, the detailed technical issues raised by IDEM and SDI for the first time before the Board "should have been developed fully and resolved during the drafting and review of the permit." *Id.* The Union contends that IDEM "failed to evaluate fairly and respond adequately to petitioners' technical comments." *Id.* It notes that IDEM failed to mention, let alone respond to, the Union's alternative calculation of SDI's PTE lead (4.03 tpy) in its response to comments. The Union also claims that IDEM did not report its lead emission factors and calculations in its response to comments and that this information was revealed for the first time in IDEM's response to the Union's petition. *Id.* at 8.

As we have stated in the past, "the regulations governing PSD permitting decisions require that material relied upon in making a permit decision be included in the record." *In re Hawaiian Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 47 (EAB, Nov. 25, 1998), 8

¹³In cases where a source's PTE "would otherwise be significant, the source may choose to limit its PTE beneath [the] significance threshold to avoid PSD review and application of [BACT]." Amicus Br. at 5. Such a source is called a "synthetic minor" source, as contrasted to "'true' or 'natural' minor sources whose emissions would not exceed significance thresholds even when they operate at full capacity without pollution controls." *Id.* at 5 n.3. In cases of synthetic minors, the emissions limit would be needed to ensure emissions remain beneath the significance level. Here, however, IDEM takes the position that the significance level will not be exceeded.

E.A.D. ____; *see In re RockGen Energy Center*, PSD Appeal No. 99-1, slip op. at 29 (EAB, Aug. 25, 1999), 8 E.A.D. ____ (final permit decision must be based on administrative record); 40 C.F.R. §§ 124.9, .18 (draft and final permit decisions must be based on information in administrative record). In this case, the data supporting a condensible lead estimate of 0.19 tpy, which IDEM claims on appeal “is consistent with estimates that were done for other similar Indiana steel mills,” IDEM Resp. at 8, were not, insofar as we can determine, included in the public record for this permit. Nor is the EPA study on which Amici rely for their low estimate of the ranges for condensible and total lead (i.e., condensible PM as fifty-one percent of total PM) in the record.¹⁴ Indeed, the only data we can locate in the record pertaining to the condensible fraction of lead or PM were placed there as part of the Union’s comments. *See* Union/Fox Cmts at 26 (offering condensible PM stack test data from two steel mills, which shows condensible PM comprises sixty-two to seventy-six percent of total PM); *see infra* Parts II.B.1.a, .c. A permitting agency may, of course, add material to the administrative record when it responds to public comments, *see* 40 C.F.R. §§ 124.17(b), .18, but here, IDEM did not do so. Instead, IDEM was silent on these issues in its response to comments, and now it seeks to introduce new information to support its decision with respect to lead. *See, e.g.*, IDEM Resp. at 8.

Not only are the data supporting IDEM’s condensible lead estimates not in the record, but the data are critical to determining whether or not the PSD lead significance level of 0.6 tpy is exceeded. Even if we were to assume that the 0.26 tpy figure IDEM used for filterable lead is appropriate, we note that the condensible lead fraction selected then determines whether the proposed mill will exceed or fall below the PSD lead significance threshold. As Amici’s example demonstrates, a condensible fraction of fifty-one percent brings the total lead estimate in beneath the significance level (at 0.54 tpy), whereas a condensible fraction of seventy-six percent brings the total lead estimate

¹⁴We note that in estimating the condensible fraction of lead emissions, Amici apparently relies on data regarding the condensible fraction of PM. *See supra* note 12.

in in excess of the significance level (at 1.08 tpy). However, if a condensible fraction of sixty-five percent were chosen (as it is by IDEM in the PM context, discussed in Part II.B.1.c below), then the total lead estimate is 0.74 tpy, and lead BACT would be triggered. In light of these differing results and IDEM's failure to document in the administrative record the basis for its decisionmaking process regarding the condensible fraction of lead, the Department clearly erred in its analysis of SDI's potential to emit lead.¹⁵

Moreover, the record shows that IDEM did not specifically address in its response to comments the Union's alternative calculation of a lead PTE of 4.03 tpy. *See* ATSD at 21-23, 31-36, 39-43, 72, 84-85 (failing to mention or discuss Union's 4.03 tpy lead estimate). Neither IDEM nor SDI, nor Amici for that matter, has directed us to portions of the administrative record demonstrating otherwise. Under the procedural rules for PSD permits, permitting agencies must "briefly describe and respond to all significant comments on the draft permit." 40 C.F.R. § 124.17(a)(2). An allegation that an agency underestimated lead emissions, accompanied by a detailed alternative analysis of such emissions -- as here -- is significant enough to warrant consideration and

¹⁵In cases such as this, where a permitting agency's PTE calculation does not trigger BACT review, it would be good practice for the agency to explain its PTE calculation on the record, at least briefly, and allow for public comment on that calculation/explanation. This would then obviate an argument that providing PTE numbers in a table or series of equations, without any narrative explaining their provenance -- as was done here -- may constitute inadequate notice to the public. *See In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 69-71 (EAB, Feb. 4, 1999), 8 E.A.D. ____ (remanding environmental justice ("EJ") portion of PSD permit because no details of EJ analysis were included in administrative record); *see also Hawaii Elec.*, slip op. at 47, 8 E.A.D. ____ (declining to rely on SO₂ and PM data not included in administrative record and thus not subject to public review, yet offered on appeal for first time by permit agency in attempt to bolster air quality analysis); 40 C.F.R. §§ 124.7-.8 (specifying requirements for statement of basis or fact sheet to accompany the draft permit, including explanations of the derivation of the conditions of the permit and the significant questions considered in preparing the draft permit).

at least some form of acknowledgment and response.¹⁶ *See In re McGowan*, 2 E.A.D. 604, 606 (Adm'r 1988) (technical comments supported by affidavits were "significant," and document containing conclusion without supportive reasoning is not adequate response to petitioner's detailed comments). Although a permitting agency may group related comments together and provide one unified response for each issue raised, *see In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 583 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. U.S. EPA*, 185 F.3d 862 (3d Cir. 1999), there is no indication that the Union's alternative lead calculations were addressed in this manner.

Finding clear error on IDEM's part, we remand the permit so that IDEM may reconsider its analysis of the proposed steel mill's potential to emit lead. *See Hawaii Elec.*, slip op. at 43-47, 8 E.A.D. ____ (finding response to comments inadequate and declining to rely on new information submitted for the first time by delegated state agency on appeal to the Board in attempt to cure deficiency). IDEM is directed to provide in the administrative record a clear rationale for its treatment of the condensible fraction of lead, including documentation of its decisionmaking process and the data upon which its decisions are based. IDEM is also directed to consider the Union's alternative calculation of a PTE of 4.03 tpy.¹⁷

¹⁶Of course, a petitioner cannot gain review of a permit merely by presenting an alternative theory regarding a technical matter. If the Board is presented with conflicting expert opinions, as is the case here, we will "look to see if the record demonstrates that the [permitting agency] duly considered the issues raised in the comments and if the approach ultimately selected * * * is rational in light of all the information in the record, including the conflicting opinions." *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 568 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. U.S. EPA*, 185 F.3d 862 (3d Cir. 1999).

¹⁷Moreover, if SDI's proposed mill is found to have a potential to emit lead in excess of the significance level, then IDEM must conduct a BACT analysis for lead emissions from the mill. In such a case, IDEM must issue its BACT determination in
(continued...)

B. BACT Issues

We turn our attention next to petitioners' challenges to IDEM's BACT decisions regarding: (1) PM emissions from the EAF; (2) NO_x emissions from the EAF; (3) NO_x emissions from the reheat furnace; and (4) PM emissions from the slag-handling area.

1. PM/PM₁₀ BACT for EAF

Particulate matter, or "PM," is "the generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes." 62 Fed. Reg. 38,652, 38,653 (July 18, 1997). Particulate matter with an aerodynamic diameter of ten micrometers or less is referred to as "PM₁₀."¹⁸ *Id.* at 38,653 n.1. A number of methods to measure PM in its various forms have been developed.¹⁹ For instance, PM can be measured as "filterable" particulates, which are collected on a filter, or as "condensable" particulates, which are captured in a condenser or impinger train.²⁰ SDI's EAF will emit both of these varieties of PM during operation.

¹⁷(...continued)

draft form and provide for public notice of and comment on the BACT decision.

¹⁸For ease of reference, we will refer to all PM/PM₁₀ as "PM" in this opinion.

¹⁹*See, e.g.*, 40 C.F.R. pt. 50, apps. L, J, M; *id.* pt. 51, app. M, methods 201, 201A, 202; *id.* pt. 60, app. A, methods 5, 17.

²⁰*See* 40 C.F.R. pt. 51, app. A, methods 201, 201A (methods for measuring filterable PM), 202 (method for measuring condensable PM); *see also In re AES Puerto Rico L.P.*, PSD Appeal Nos. 98-29 to -31, slip op. at 31 (EAB, May 27, 1999), 8 E.A.D. ____ ("emissions that contribute to ambient PM₁₀ concentrations are the sum of in-stack [non-condensable] PM₁₀ * * * and condensable emissions") (quoting 55 Fed. Reg. 14,246, 14,246 (Apr. 17, 1990)), *aff'd sub nom. Sur Contra La Contaminacion v. EPA*, 202 F.3d 443 (1st Cir. 2000).

In analyzing BACT for EAF emissions of these pollutants, IDEM's approach evolved over the course of the permitting process. Initially, IDEM focused solely on SDI's emissions of filterable PM, concluding that BACT for that type of PM is a baghouse with an emissions limit of 0.0018 grains per dry standard cubic feet ("gr/dscf") of exhaust air. TSD app. B at 19. After receiving and considering comments on this determination, however, IDEM expanded its focus to include condensible as well as filterable PM. IDEM established a total PM emissions limit of 0.0052 gr/dscf to cover both filterable and condensible PM and made the limit adjustable, subject to revision after an initial stack test is conducted and public notice and comment received on any proposed limit change. Permit § D.1.6(b). IDEM also retained the filterable PM-only limit of 0.0018 gr/dscf and the use of the baghouse as components of its revised BACT determination. Permit § D.1.6; ATSD at 10-11. IDEM did not specify any particular technology as BACT for condensible PM *per se*, but by adopting a total PM limit of 0.0052 gr/dscf, IDEM appears implicitly to have established a limit for condensible PM of 0.0034 gr/dscf. *See* Permit § D.1.6.

Petitioners raise three challenges to IDEM's BACT analysis for PM emissions from the EAF. First, petitioners contend that IDEM failed to conduct a complete, "top-down" analysis of available control technologies for condensible PM when it added the total PM limit to the permit. Second, petitioners argue that the emissions limit devoted solely to filterable PM, 0.0018 gr/dscf, does not represent BACT for that pollutant. Third, petitioners claim that IDEM failed to justify its selection of 0.0052 gr/dscf as the new total PM BACT emissions limit. Each of these contentions is addressed in turn.

a. *Top-Down BACT Analysis for Condensible PM*

In 1990, EPA issued draft guidance for permitting authorities to use in, among other things, analyzing PSD requirements. *See* U.S. EPA, Office of Air Quality Planning & Standards, *New Source Review Workshop Manual* (draft Oct. 1990) ("*NSR Manual*"). The *NSR Manual* sets forth a "top-down" process for determining BACT. The

process includes five steps: (1) identifying all available control options for a targeted pollutant; (2) analyzing the options' technical feasibility; (3) ranking feasible options in order of effectiveness; (4) evaluating their energy, environmental, and economic impacts; and (5) selecting BACT as the most effective option not eliminated in a preceding step.²¹ *Id.* at B.5-.9; see *In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 11-14 (EAB, Feb. 4, 1999), 8 E.A.D. ___ (expounding on steps in top-down analysis); *In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 24-34 (EAB, Nov. 25, 1998), 8 E.A.D. ___ (same). This top-down analysis is not a mandatory methodology, but it is frequently used by permitting authorities to ensure that a defensible BACT determination, involving consideration of all requisite statutory and regulatory criteria, is reached.²² See *Knauf*, slip op. at 12 n.14, 8 E.A.D. ___ (“[w]e would not reject a BACT determination simply because the permitting authority deviated from the NSR Manual, but we would scrutinize such a determination carefully to ensure that all regulatory criteria were considered and applied appropriately”).

²¹EPA guidance states:

[T]he top-down process provides that all available [pollution] control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent -- or “top” -- alternative. That alternative is established as BACT unless the applicant demonstrates, 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.

NSR Manual at B.2.

²²While the *NSR 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, e.g., *Hawaii Elec.*, slip op. at 9 n.7, 8 E.A.D. ___; *In re Masonite Corp.*, 5 E.A.D. 551, 558 & n.8 (EAB 1994).

In its original BACT review, IDEM analyzed four technologies for the control of filterable PM emissions. *See* TSD app. B at 16-19 (evaluating electrostatic precipitators, cyclone collectors, high energy wet scrubbers, and fabric filters (baghouses)). IDEM selected a baghouse as BACT for filterable PM and imposed an emissions limit of 0.0018 gr/dscf. Draft Permit § D.1.6. In so doing, IDEM did not explain why it chose to focus only on filterable PM rather than total PM. *See* TSD app. B at 16-19.

In comments on the draft permit, the Union asserted that “a substantial fraction of the particulate matter released during steelmaking exits as condensable PM.” Union/Fox Cmts at 26. The Union supported its assertion with stack test data from two steel mills, which showed that approximately sixty-two to seventy-six percent of total PM emitted by EAFs, after controls, is condensable PM. *See id.* (citing test data from Beta Steel of Portage, Indiana and IPSCO Steel of Muscatine, Iowa). In its petition, the Union underscores the importance of accounting for condensable PM emissions by referencing EPA guidance that advises permit issuers to be sure to measure condensables emitted by sources where such PM constitutes a significant fraction of total PM. Union Pet’n at 12 (citing Letter from Thomas G. Pace, Acting Chief, SO₂/PM Programs Branch, Office of Air Quality Planning & Standards, U.S. EPA, to Sean Fitzsimmons, Iowa Department of Natural Resources at 2 (Mar. 31, 1994)).

As noted previously, IDEM responded to these and related comments by adding to the permit, in addition to the filterable limit, a limit of 0.0052 gr/dscf for emissions of total PM (including both filterable and condensable PM) from the EAF stack. Permit § D.1.6(b); *see* ATSD at 8-11. IDEM also reevaluated the air quality impact analysis using the new PM limit and found that the proposed mill would remain in compliance with the NAAQS and air quality increments even with the increased limit. IDEM Resp. at 12.

In establishing the new permit provision, IDEM addressed four technologies suggested by the Union for control of condensible PM emissions²³ by stating:

[IDEM] is unaware of any BACT decision in the country considering a means to control [condensible PM] emitted from an EAF. [IDEM] is unaware of any large industrial processes (i.e., greater than 1 million cubic feet of exhaust air per minute) using any of the processes mentioned by the Union. However, of the control technologies described by the [Union], scrubbers have the most common industrial application. High energy scrubbers were included in the BACT analysis and found to be infeasible due to the economic and environmental impacts. There is very limited information with regard to the amount of condensible [PM] that is emitted from an EAF. Based on the information available to [IDEM, including condensible stack tests conducted at IPSCO Steel in Muscatine, Iowa, SDI in Butler, Indiana, and Beta Steel in Portage, Indiana], the amount of uncontrolled condensible PM is fairly consistent with the amount of controlled filterable PM from the baghouse exhaust. [IDEM] is unaware of any control technology [that] would be economically feasible to control that amount of PM from a system exhausting 1.3 million cubic feet of air per minute.

²³The four technologies are dry sorption processes, carbon columns, condensers, and distillation. See Union/Fox Cmts at 27. The Union also suggested scrubbers as a control technology for condensible PM, *see id.*, but IDEM had previously addressed that technology in its initial BACT analysis for filterable PM. See TSD app. B at 17 (evaluating high energy wet scrubbers for control of filterable PM). IDEM rejected scrubbers because they would have unacceptably high -- in comparison to baghouses -- environmental and economic impacts (e.g., higher utility costs and generation of large quantities of sludge). *Id.*

ATSD at 11 & n.1.

Petitioners argue that in so responding, IDEM bypassed the top-down BACT analysis needed to ensure proper control of condensible PM emissions. Union Pet'n at 13-14; COW Pet'n at 10. They contend that the series of statements quoted above are conclusory, lacking in any supporting data or analysis in the administrative record. Union Pet'n at 13. According to the Union, "IDEM has simply concluded that it is not feasible to control condensibles, without making an earnest attempt to investigate the issue and without providing any analysis to satisfy its burden of showing that a particular technology is technically or economically unachievable." Union Pet'n at 14.

In its response on appeal, IDEM argues that the control technologies the Union suggests for use here "have not been applied to EAFs and were not considered to have a demonstrated or practical potential to achieve a high level of control for total PM due to the fact that they are not used on large industrial processes, like the EAF." IDEM Resp. at 13 (citing ATSD at 11); *see NSR Manual* at B.12 (technologies lacking demonstrated potential to achieve highest levels of control need not be considered in BACT analysis). IDEM also asserts that the control technologies identified by the Union have not been demonstrated in a commercial application on identical or similar emission units and thus are akin to "innovative control technologies," which are not required to be evaluated in a BACT analysis. *Id.* (citing *NSR Manual* at B.13). IDEM apparently concludes (without explicitly stating) that the four control options advanced by the Union are not "available"²⁴ in this

²⁴According to the *NSR Manual*, the term "available," as used in the first step of the top-down BACT analysis, is defined as "those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation." *NSR Manual* at B.5. Availability should be construed in its broadest sense, with the goal of developing a comprehensive list of potentially applicable control options. *In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 13 (EAB, Feb. 4, 1999), 8 E.A.D. ____.

context and thus were excluded from BACT review under Step 1 of the top-down analysis. *See id.*; ATSD at 9-11.

Petitioners, as proponents of a permit provision that is different from that adopted by the permit issuer, have the burden of demonstrating clear error or abuse of discretion in IDEM's decision. *See* 40 C.F.R. §§ 124.13, .19(a); *see also In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 8 (EAB, Nov. 25, 1998), 8 E.A.D. ____ (burden of demonstrating review is warranted rests with petitioner); *In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 9 (EAB, Sept. 10, 1998), 8 E.A.D. ____ (same). However, after IDEM claimed it was unaware of any large facilities using any of the Union's suggested technologies, petitioners failed to identify in rebuttal even a single industrial facility, steel mill or otherwise, large or small, nationwide or internationally, with such equipment in place or even undergoing testing. *See* Union Pet'n at 12-15; COW Pet'n at 10. Similarly, petitioners failed to identify any facilities attempting to control condensible PM emissions from an EAF using any technologies other than baghouses.²⁵ They also failed to produce any evidence demonstrating that there is a strong reason to believe the Union's suggested technologies are transferable to this type and size of facility. Petitioners therefore have given us no reason to question IDEM's decision not to apply the four technologies. *See, e.g., Hawaii Elec.*, slip op. at 8, 8 E.A.D. ____ (petitioner must explain why permit issuer's prior response to petitioner's objections is clearly erroneous or otherwise warrants review); *see also In re Mecklenburg Cogeneration Ltd. Partnership*, 3 E.A.D. 492, 494 n.3 (Adm'r 1990) ("[A] permit issuer does not commit clear error if it carefully considers the potentially transferrable technologies in the

²⁵In its comments on the draft permit, the Union identified two steel mills -- IPSCO Steel of Muscatine, Iowa and Nucor Steel of Crawfordsville, Indiana, which both use baghouses -- as having condensible PM emissions limits in place. *See* Union/Fox Cmts at 26-27. Neither of these mills, however, is mentioned in the portion of the Union's petition addressing this issue, *see* Union Pet'n at 12-15, nor are any facilities identified with respect to this issue in the COW petition. *See* COW Pet'n at 10.

context of a particular project * * * but its level of consideration or documentation nonetheless falls short of matching the level that would be expected, for example, if the permit issuer were rejecting a top technology with a proven track record in the same source category. A rule of reason proportionate to the technology's track record necessarily governs how much detail and documentation must go into consideration of a particular technology."'). Because we find no clear error or abuse of discretion in IDEM's condensible PM BACT analysis, we deny review on this ground.

b. Filterable PM Limit as BACT

Next, petitioners argue that the filterable PM limit, 0.0018 gr/dscf, is not BACT. Union Pet'n at 15-20; COW Pet'n at 10-11. Petitioners introduced evidence and arguments on this issue during the comment period and now claim that IDEM ignored much of that information, choosing instead simply to reiterate its position that 0.0018 gr/dscf is the most stringent filterable PM limit applied to any EAF baghouse. On appeal, petitioners argue, in essence, that two dozen similar steel mills emit less than the proposed filterable PM limit of 0.0018 gr/dscf. Petitioners also argue that IDEM's cost-effectiveness analysis, which found Gore-Tex bags economically infeasible, improperly includes costs for a selective catalytic reduction system that is used for NO_x removal, not PM removal. Union Pet'n at 17. Finally, petitioners argue that IDEM failed to set a filterable PM limit that will adequately protect people from the adverse health impacts of HAPs emitted as PM. *Id.* at 17-19. Each of these arguments is described more fully below.

Petitioners begin by contending that a limit of 0.0018 gr/dscf is unreasonably high because numerous steel mills have actual filterable PM emissions lower than that limit. The Union points to EAF stack test measurements of filterable PM emissions from Nucor Steel, at 0.0017 gr/dscf; IPSCO Steel, at 0.0008 gr/dscf; and twenty-one other steelmaking facilities at 0.0001 to 0.0015 gr/dscf of filterable PM emissions. Union Pet'n at 16 & exs. 1-A, -J. In addition, COW cites stack test results for Northstar Steel, at 0.00029 gr/dscf of filterable PM

emissions. COW Pet'n at 10-11. This evidence, petitioners claim, proves that SDI's limit is not the lowest achievable concentration for EAF baghouses. Union Pet'n at 19. Thus, because BACT requires the establishment of emissions limits "commensurate with the current state and capabilities of the chosen technologies," petitioners allege that IDEM erred in setting such a high limit. COW Pet'n at 11; *see* Union Pet'n at 19-20.

In response, IDEM argues that single stack tests, such as the ones cited, are not representative of the level of emissions a source may consistently achieve over a period of days and years. IDEM Resp. at 14. According to IDEM, "[t]o set a limit based only on a stack test, or even a few stack tests, without information to support the ability of a source to continuously achieve that limit, is inappropriate and unrealistic since it would likely be setting the source up for non-compliance." *Id.*

Amici disagree with this argument, pointing out that IDEM's claim that stack test data are inadequate to establish BACT performance levels "runs directly counter to the approach outlined" in the *NSR Manual* and "call[s] into question IDEM's reliance on stack testing to demonstrate compliance."²⁶ Amicus Br. at 12 n.11; *see NSR Manual* at B.23-.24 (experiences of other sources (among other things) "provide the basis for determining achievable [BACT] limits"; performance data (i.e., stack tests) and recent regulatory decisions should be used to identify BACT limits). However, Amici do not suggest a remand on this basis, claiming instead that "[t]he information submitted to IDEM by the Petitioners did not include adequate information to determine whether the

²⁶The Union agrees with Amici, noting that IDEM's "line of argument leads one to the conclusion that source tests produce results that are 'only occasionally achievable,' which is not only untrue, but also a rather strange position for a regulatory agency to take." Union Reply at 11.

limits obtained during the stack tests would be practicably achievable by this proposed facility.”²⁷ Amicus Br. at 14.

In our view, and contrary to petitioners’ arguments, IDEM appears to have taken into consideration petitioners’ comments regarding the low actual emissions achieved at the two dozen mills. For example, IDEM included direct but abbreviated responses to petitioners’ three specifically named examples (i.e., Nucor Steel, IPSCO Steel, and Northstar Steel) in its response-to-comments document. *See* ATSD at 10. Moreover, in its comment summary, IDEM quoted sentences that immediately preceded and followed the Union’s statements about the twenty-one low-emissions stack tests, which suggests at a minimum that an IDEM employee read the Union’s comments regarding those tests. *Compare* Union/Fox Cmts at 27 *with* ATSD at 9. This inference is confirmed later in the response-to-comments document, near the end of IDEM’s lengthy PM BACT response, when IDEM asserts:

The comments from the Union state[] the numbers lower than 0.0018 gr/dscf as limits. However, these were the results of stack tests performed at sources with much higher limitations established in their permits. [IDEM] does not believe that enough information has been established to establish a lower limitation for the filterable portion of [PM].

ATSD at 11.

This passage appears to be a reference to petitioners’ two dozen stack tests and, furthermore, appears to indicate that IDEM was able to determine, from some unspecified source or sources, the BACT limitations for those facilities. While IDEM did not specify in the

²⁷Unfortunately, Amici do not specify what further information they believe necessary to determine whether the low emissions levels the Union cites could be practically achieved by SDI’s proposed mill.

administrative record what information it believed to be lacking from petitioners' examples, based on the totality of the circumstances, including the fact that IDEM considered and briefly responded to the comments and gave extensive consideration to the overall filterable PM limit, we find IDEM's abbreviated treatment of petitioners' evidence to be minimally adequate and therefore have decided not to remand on this basis.²⁸

IDEM examined BACT analyses for fifteen steel mills and determined that 0.0018 gr/dscf is the lowest filterable PM BACT limit ever established for this type of facility. *See* TSD app. B at 16-19 (six of fifteen mills in IDEM sample have 0.0018 gr/dscf as filterable PM BACT; remainder have higher limits). Petitioners do not dispute that this is the case. Union Reply at 14. Permit agencies have discretion to set BACT limits at levels that do not necessarily reflect the highest possible control efficiencies but, rather, will allow permittees to achieve compliance on a consistent basis. *In re Masonite Corp.*, 5 E.A.D. 551, 560-61 (EAB 1994); *see In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 99-8 to -72, slip op. at 21 (EAB, Mar. 14, 2000), 8 E.A.D. ____ (“There is nothing inherently wrong with setting an emission limitation that takes into account a reasonable safety factor.”). IDEM appears to have essentially done that in this case by opting for the most stringent filterable PM limit ever imposed on similar facilities, albeit not the lowest level of emissions such facilities have ever achieved. Indeed, while the Union's stack test evidence suggests that a lower limit may be achievable by some steel mills, we cannot on this record conclude, without more, that it was clearly erroneous for IDEM to reject the Union's evidence in favor of the fifteen BACT determinations. *See* Amicus Br. at 14.

Accordingly, we deny review of the filterable PM BACT limit of 0.0018 gr/dscf. We find no clear error or abuse of discretion in IDEM's

²⁸It would have been much better practice for IDEM to have provided a more detailed response to comments and not left petitioners guessing as to what further information it needed to establish a lower PM limitation.

overall treatment of this issue, nor do any other matters warrant an exercise of our discretion to grant review.²⁹

c. Justification of Total PM Emissions Limit

Finally, petitioners claim that IDEM added the new 0.0052 total PM limit to SDI's permit without explaining why it selected that figure as opposed to a lower figure. Union Pet'n at 14; COW Pet'n at 10. The Union contends that it supplied two source tests from similar steel mills showing total PM emissions of 0.0017 gr/dscf (Nucor Steel,

²⁹We also deny review on the basis of petitioners' two alternate grounds for remand, which consisted of allegations pertaining to (1) a Gore-Tex versus polyester bag cost-comparison chart, and (2) HAPs emitted as PM and their purportedly adverse effect on human health.

First, with respect to the bag-costing issue, petitioners claim that SCR costs are erroneously included in the analysis and thus invalidate the conclusion that Gore-Tex bags are cost-ineffective in comparison to polyester bags. Union Pet'n at 17. We note that IDEM rejected Gore-Tex bags for reasons unrelated to cost concerns. See ATSD at 9-11 (explaining that at Tuscaloosa Steel in Alabama, Gore-Tex bags are used because of their superior heat-resistance capabilities (the baghouse there is extremely close to the EAF), and noting that Tuscaloosa Steel's stack tests have not shown improved PM-reduction performance over standard polyester bags, but rather equivalent performance). Moreover, petitioners did not rebut either of the heat or equivalent-performance premises upon which IDEM relied to rule out Gore-Tex. In such circumstances, we find it unnecessary to consider the cost issue raised by petitioners. There has been no showing of clear error or abuse of discretion on IDEM's part.

Second, with respect to the health/HAPs issue, IDEM has considerable discretion to evaluate HAPs emissions and potential health impacts as part of its consideration of environmental impacts in general. See *NSR Manual* at B.50-.53; see also *In re North County Resource Recovery Assocs.*, 2 E.A.D. 229, 230 (Adm'r 1986) (referencing statutory and regulatory definitions of BACT as requiring consideration of environmental impacts). In this case, IDEM performed an air quality analysis for HAPs and added permit limits for the HAPs of most concern (lead, manganese, mercury, beryllium, and fluorides). IDEM Resp. at 16-17; see TSD app. C at 8-9; Permit § D.1.11. We find no clear error or abuse of discretion in IDEM's treatment of this issue.

Crawfordsville, Indiana) and 0.0045 gr/dscf (IPSCO Steel, Muscatine, Iowa), which suggest the 0.0052 gr/dscf limit chosen by IDEM is unreasonably high because it exceeds these two sources' actual emissions. Union Pet'n at 14-15.

In response, SDI correctly points out that the Nucor stack test was conducted using EPA Reference Method 5D, which measures filterable PM only; thus the test is not instructive in the way the Union intended. SDI Resp. at 28; *see* Union Pet'n ex. 1-I (Nucor stack test report); *see also* 40 C.F.R. pt. 60, app. A, method 5D ("Determination of PM Emissions from Positive Pressure Fabric Filters"). SDI also notes that IPSCO's stack test showed emissions of 0.0037 gr/dscf condensible PM (i.e., greater than the 0.0034 gr/dscf implicitly attributed to condensible PM in SDI's permit) and 0.0008 gr/dscf filterable PM (i.e., less than SDI's proposed filterable PM limit of 0.0018). SDI Resp. at 28 n.26; *see* Union Pet'n ex. 1-K (IPSCO stack test report). SDI "vehemently disagrees" with any attempt to set permit limits for its mill on the basis of this single stack test from IPSCO Steel. SDI Resp. at 28.

IDEM, for its part, contends that it had little information to guide its analysis of a total PM limit. It surveyed fifteen steel mills with BACT installed (baghouses in all cases) and found that only one mill, IPSCO Steel, had a total PM emissions limit (all other mills had filterable PM-only limits). IDEM Resp. at 11; *see* TSD app. B at 17-18. IPSCO Steel's total PM limit was 0.0025 gr/dscf, Union Pet'n ex. 1-K, but because the mill tested out of compliance in November 1998, the limit is purportedly being revisited by the permitting authorities in Iowa. *See* ATSD at 10; Union Pet'n ex. K (IPSCO Steel November 1998 stack test results). Thus, IDEM did not rely on IPSCO's total PM limit, or its actual emissions as demonstrated by the stack test, in its limit-setting analysis. *See* ATSD at 10.

Instead, IDEM concluded from its review of the RACT/BACT/LAER Clearinghouse³⁰ and its fifteen-mill survey that 0.0018 gr/dscf is the most stringent filterable PM limitation applied to an EAF and should be considered BACT. *See id.* at 9-10; TSD app. B at 17-19. Petitioners' comments did not change IDEM's conclusion on this point. ATSD at 9-10. IDEM then apparently decided to attribute to condensible PM a maximum of 0.0034 gr/dscf, for a total PM limit of 0.0052 gr/dscf. On appeal, IDEM contends that the condensible PM fraction constitutes sixty-five percent of the total PM limit, which is consistent with the Union's estimate of condensible PM percentages in EAF exhaust gases (i.e., sixty-two to seventy-six percent). IDEM Resp. at 11-12. IDEM also notes that the New Source Performance Standard for EAFs requires that filterable PM emissions not exceed 0.0052 gr/dscf. *Id.* at 11 & n.5.

IDEM and SDI claim that IDEM's approach to establishing a total PM limit is similar to that taken by permitting authorities in two cases: *In re AES Puerto Rico L.P.*, PSD Appeal Nos. 98-29 to -31 (EAB, May 27, 1999), 8 E.A.D. ___, *aff'd sub nom. Sur Contra La Contaminacion v. EPA*, 202 F.3d 443 (1st Cir. 2000), and *In re Hadson Power 14*, 4 E.A.D. 258 (EAB 1992). IDEM and SDI argue that in this case, as in those, the permit issuer had very little information on actual emissions of the targeted pollutants. When the issuers decided to set emissions limits that could be adjusted in accordance with certain parameters, and in at least one case supported the limit with a worst-case air quality analysis, the Board found such approaches to be reasonable. *See AES Puerto Rico*, slip op. at 31-34, 8 E.A.D. ___ (setting low

³⁰“RACT/BACT/LAER” stands for “Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate.” Each of these acronyms refers to technological standards established by different sections of the CAA. BACT is the standard from the PSD provisions of the CAA. *See* CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4). The RACT/BACT/LAER Clearinghouse contains information on emission controls and emission limits for industrial facilities across the country. The Clearinghouse is organized by source category, thereby making it relatively easy to access emission control information for a particular industrial enterprise.

emissions limit with potential for upward adjustments, subject to a cap); *Hadson Power*, 4 E.A.D. at 288-93 (setting high emissions limit with potential for downward adjustments). Here, IDEM and SDI argue, IDEM conducted a worst-case air quality analysis, and it set a reasonable limit based on all available data and subject to adjustment in accordance with actual emissions data, just as the authorities in *AES Puerto Rico* and *Hadson Power* did. IDEM Resp. at 12; SDI Resp. at 25-26.

We agree that there is no clear error or abuse of discretion in IDEM's handling of this issue. While IDEM failed to explain its derivation of the 0.0052 figure in the response to comments document, it is nonetheless a simple calculation to subtract the filterable PM limit, 0.0018 gr/dscf, from the total limit, 0.0052 gr/dscf, and thereby conclude that condensible PM is implicitly limited to 0.0034 gr/dscf. This condensible PM figure is approximately sixty-five percent of the total PM figure, which is in keeping with the Union's own estimates of condensible-to-total PM ratios. *See* Union/Fox Cmts at 26 (estimating that approximately sixty-two to seventy-six percent of total PM emitted by EAFs, after controls, is condensible PM). Thus, while IDEM should have clearly explained its decisionmaking process in the record, *see In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 19 (EAB, Feb. 4, 1999), 8 E.A.D. ___, the reality in this case is that petitioners could deduce the likely basis for IDEM's choice of the total PM emissions limit and we are able to discern that IDEM applied its considered judgment in setting that limit.³¹

³¹Notably, we do not read *Hadson Power* or *AES Puerto Rico* in such a way as to sanction cursory documentation of a BACT analysis where little permit limit and/or actual emissions information is available, so long as the chosen limit is conditioned on certain parameters. Instead, permit issuers must adequately document their decisionmaking processes. *See, e.g.*, 40 C.F.R. § 124.17(a)(1) (response to comments must specify reasons for any changes made between draft and final permits); *see also In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997) (remanding RCRA permit because permitting authority's rationale for certain permit limits was not clear and therefore did not reflect considered judgment required by regulations); *In re Austin* (continued...)

Moreover, we have not been presented with a compelling reason to believe that IDEM's failure to explain its total PM limit calculus led to a clearly erroneous permit decision. *See In re Mecklenburg Cogeneration Ltd. Partnership*, 3 E.A.D. 492, 494 n.3 (Adm'r 1990) ("For a remand, there must be a compelling reason to believe that the omissions led to an erroneous permit determination -- in other words, that they materially affected the quality of the permit determination."). Rather, it appears from IDEM's explanations on appeal that a remand would elicit nothing more from IDEM than a reassertion of those explanations. Accordingly, we deny review of the total PM BACT limit. We find no clear error or abuse of discretion in IDEM's overall treatment of this issue, and no other issues warrant an exercise of our discretion to grant review.

2. *NO_x BACT for EAF*

The Union next contends that IDEM failed to require BACT for SDI's emissions of NO_x from the EAF. Union Pet'n at 20-22. IDEM determined that combustion controls consisting of low-NO_x/oxyfuel burners constitute BACT in this context. ATSD at 19-21; TSD app. B at 8-12. The Union, however, argues that selective catalytic reduction ("SCR") technology should have been chosen as BACT. Union Pet'n at 22.

In conducting its original NO_x BACT review, IDEM evaluated four control technologies, including SCR, and concluded that SCR was technically infeasible for application to the EAF. TSD app. B at 8-9. IDEM explained:

³¹(...continued)

Powder Co., 6 E.A.D. 713, 720 (EAB 1997) (remand due to lack of clarity in permitting authority's explanation). While for the reasons noted in the text, under the circumstances here we have decided not to remand due to the lack of explanation, permitting agencies should not view this as an invitation to avoid their responsibilities to explain their decisionmaking. Imprecision on this front can both lead to potentially avoidable appeals, with their attendant delays, and unnecessarily increase the potential for remand.

In order for a[n] SCR system to effectively reduce NO_x emissions, the exhaust gas stream should have relatively stable gas flow rates, NO_x concentrations, and temperature -- steady-state system. The EAF operation is a highly transient process and is a batch operation. The temperature of the EAF exhaust gas will vary widely over the melt cycle, and the gas flow rates and NO_x concentrations will exhibit a wide amplitude.

Id. at 9. This language is taken almost verbatim from SDI's PSD application. *See* IDEM Resp. ex. D at 12-13 (SDI's BACT analysis). Notably, Dames & Moore, the consultant that prepared this portion of SDI's application, concluded that SCR constitutes a "technology transfer" situation in the EAF context, because no other EAF that it was aware of uses an SCR for NO_x reduction. *Id.* at 13; *see NSR Manual* at B.11 ("Opportunities for technology transfer lie where a control technology has been applied at source categories other than the source under consideration."). IDEM noted that in SCR systems, ammonia is injected into exhaust gases upstream of a catalyst bed, upon which the ammonia reacts with NO_x to form nitrogen and water. IDEM Resp. at 9. IDEM stated:

SCR systems are highly susceptible to catalyst poisoning due to contamination of the catalyst by reactive materials entrained in the EAF gas stream. Other problems with catalysts are their propensity to fouling and masking. Fouling occurs when the catalyst's cell openings are plugged with a solid material. Masking occurs when the catalyst surfaces are covered with residues [that] prevent their contact with the flue gas. The problems with catalyst poisoning, fouling, and masking would, at a minimum, require the placement of the SCR unit downstream of the particulate control device (baghouse). Because SCR catalysts require high gas stream temperatures (500 to 1,100 EF), the gas stream would have to be reheated from approximately

200 EF to the proper operating temperature for the catalyst. This would require substantial energy expenditure (natural gas combustion) and result in additional NO_x emissions, not to mention CO emissions. SCR catalyst suppliers and manufacturers that were contacted confirm the above problems. Therefore, this technology is considered technically infeasible.

Id.

In its response to comments, IDEM specified that to ensure proper SCR function, 1.3 million cubic feet per minute of exhaust gases would have to be reheated prior to entry into the SCR from the EAF baghouse. ATSD at 20-21. This reheating process would be fueled by natural gas and would result in additional NO_x and CO emissions. *Id.* at 20; TSD app. B at 9. IDEM found that these environmental impacts, combined with the technical difficulties of applying a steady-state technology to a highly variable manufacturing process, rendered SCR infeasible. ATSD at 20; *see* IDEM Resp. at 19.

According to the Union, “[a] permitting authority’s decision to eliminate potential control options as a matter of technical infeasibility * * * must be adequately explained and justified.” Union Reply at 17 (quoting *In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 15 (EAB, Feb. 4, 1999), 8 E.A.D. ____). The Union argues that IDEM erroneously failed to provide detailed information about exhaust stream characteristics and technological capabilities to support its conclusion of SCR infeasibility, in contravention to guidance set forth in the *NSR Manual*. Union Pet’n at 22 (citing *NSR Manual* at B.19). Indeed, the Union claims that IDEM advanced only “cursory, conclusory, speculative, and unsubstantiated opinion” rather than actual support for its decision. *Id.* at 20. The Union also argues that it provided IDEM with information about two Japanese steel mills that installed SCR in the 1970s and successfully used the technology to achieve NO_x reductions of eighty-four to ninety percent. *Id.* at 20-21; Union Reply at 15. The Union alleges that IDEM failed to address this information in its response

to comments and its BACT analysis, in contravention of EPA guidance directing consideration of technologies employed internationally. Union Pet'n at 20-21 (citing *NSR Manual* at B.11-12 (BACT analysis must identify technologies used outside the United States "to the extent that the technologies have been successfully demonstrated in practice on full scale operations"))).

In defense of the BACT analysis, neither IDEM nor SDI raises the obvious argument that the Union's Japanese-mill comments were not considered because they were received after the close of the public comment period.³² Instead, IDEM stresses that under the *NSR Manual*, only those international applications successfully demonstrated in practice need be considered. IDEM Resp. at 18 (citing *NSR Manual* at B.11). IDEM apparently discounted the Union's Japanese evidence because the two mills in question are no longer operating and virtually no data are available regarding SCR performance at the mills.³³ *See id.* For its part,

³²Permitting authorities are under no obligation to consider comments received after the close of the public comment period. *See, e.g.*, 40 C.F.R. § 124.18(a)-(b) (final permit decisions must be based on administrative record, which includes comments received during public comment period); *id.* § 124.13 (to ensure consideration of their comments, interested persons "must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period").

In this case, there is no dispute that the Union's Japanese steel mill evidence was not received by IDEM until after the public comment period closed. *See* Union Pet'n at 20-21 & exs. 2, 3-C (explaining that it notified IDEM on June 3, 1999, approximately two weeks after the close of the public comment period, that SCR technology had been used to control NO_x emissions from EAFs in Japan, and noting that later that month it sent IDEM a copy of correspondence it had received from Hitachi Zosen, an SCR manufacturer, which indicated that SCR had been installed at two Japanese steel mills in the 1970s and that the mills were no longer in operation).

³³The Union points to the correspondence it received from Hitachi Zosen, which lists "DeNO_x Efficiency" for the mills as 90 and 84 percent, respectively, and
(continued...)

SDI notes that fuel oil and kerosene, which fueled the Japanese mills, Union Pet'n ex. 2, are "markedly different" from the oxyfuel and natural gas it plans to burn, and emphasizes that "the emissions from such disparate processes cannot be compared to SDI." SDI Resp. at 41. Finally, SDI argues that the Union's Japanese steel mill information constituted an "insignificant comment" and thus did not warrant an IDEM response. *Id.* (citing 40 C.F.R. § 124.17(a)(2) (permit issuer must briefly respond to all "significant" comments) & *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 582-84 (EAB 1998) (no duty to respond to insignificant comments), *review denied sub nom. Penn Fuel Gas, Inc. v. U.S. EPA*, 185 F.3d 862 (3d Cir. 1999)).

While the Union correctly identifies IDEM's burden to justify its BACT decision, it fails to carry its own burden of establishing that IDEM clearly erred or abused its discretion in this BACT analysis. *See* 40 C.F.R. § 124.19(a) (burden of demonstrating review is warranted rests with petitioner); *accord In re Kawaihae Cogeneration Project*, 7 E.A.D. 107, 114 (EAB 1997); *In re EcoEléctrica, L.P.*, 7 E.A.D. 56, 60-61 (EAB 1997). As we have explained, "[W]here an alternative control option has been evaluated and rejected, those favoring the option must show that the evidence 'for' the control option clearly outweighs the evidence 'against' its application." *In re Inter-Power of New York, Inc.*, 5 E.A.D. 130, 144 (EAB 1994); *see In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 19 (EAB, Sept. 10, 1998), 8 E.A.D. _____. Here, the Union submitted nothing challenging the steady-state requirements of SCR, the varied state of the EAF, or the phenomena of SCR catalyst poisoning, fouling, or masking in the EAF context. Moreover, the Union did not provide data calling into question the significant temperature differential between the baghouse and the SCR

³³(...continued)

"Outlet NO_x" as 30 and 42 parts per million, respectively. Union Reply at 15-16; Union Pet'n ex. 3-C. There is no information in the record, however, to substantiate when or how these removal levels were achieved or to explain the operating parameters of the steel mills' EAFs or SCR systems.

system, or the associated environmental impacts, identified by IDEM. Whereas data or information on any of these issues may have provided us sufficient reason to examine IDEM's analysis further, a bald claim that the analysis is "cursory" and "speculative" is simply not, on these facts, enough to substantiate a grant of review. The Japanese mill evidence is similarly unpersuasive, given its age, the mills' lack of continued operation, the fuel and operational differences among the three mills, and the paucity of information about SCR performance at the Japanese mills.³⁴ As Amici explain, the information "failed to describe whether application of SCR was successful, or the manner in which it might have been applied." Amicus Br. at 17.

In view of all the evidence, we find IDEM's explanations in the original BACT analysis and the response to comments to be reasonably detailed summaries of the technical and environmental hurdles raised by the potential application of SCR in this operational context. Moreover, IDEM's analysis stands unrebutted in any of its particulars. *See Maui*, slip op. at 19, 8 E.A.D. ___ (petitioner's failure to rebut permit issuer's reasons for rejecting a control option leads to denial of review). Accordingly, we find no clear error or abuse of discretion in IDEM's determination of NO_x BACT for the EAF.

3. BACT for Reheat Furnace Emissions of NO_x

a. Background

Next, petitioners, supported by Amici, challenge IDEM's analysis of BACT for NO_x emissions from the reheat furnace. In its original BACT review for this unit, IDEM evaluated four technologies: (1) combustion controls (e.g., low-NO_x/oxyfuel burners); (2) SCR;

³⁴Petitioner's exhibits 2 and 3-C contain a limited amount of information about the two Japanese steel mills. *See* Union Pet'n exs. 2, 3-C; *supra* note 33. That information, however, is not sufficiently developed or supported to allow us to draw meaningful conclusions about SCR performance or operating conditions at the mills.

(3) Non-Selective Catalytic Reduction (“NSCR”); and (4) Selective Non-Catalytic Reduction (“SNCR”). *See* TSD app. B at 23-24; *see also id.* at 8-10. IDEM found combustion controls and SNCR to be technically feasible, expressed reservations about SCR’s technical feasibility (because of compliance problems with an SCR/reheat combination at Beta Steel in Portage, Indiana), and apparently found NSCR to be technically infeasible.³⁵ *See id.* at 23-24. IDEM then determined that SCR’s cost-effectiveness was \$4,300 per ton of NO_x removed and that SNCR’s ranged from \$5,300 to \$5,700 per ton. IDEM decided these figures made SCR and SNCR economically infeasible and concluded that BACT for NO_x emissions from SDI’s reheat furnace consisted of natural gas-fired, ultra low-NO_x burners with an emissions factor of 0.11 lbs/MMBtu. *Id.* at 24.

In comments on the proposed permit containing this BACT determination, the Union and EPA Region V separately pointed out that Beta Steel’s compliance problems were caused by design issues, not failures in technical capability.³⁶ ATSD at 1-2. On the economic side,

³⁵We say “apparently” here because IDEM is wholly silent on the subject of NSCR. *See* TSD app. B at 23-24. However, because IDEM did not consider NSCR’s economic feasibility, we infer that the Department likely considered NSCR to be technically infeasible.

³⁶For instance, the Union mentioned that duct insulation located upstream from the SCR had disintegrated and clogged the SCR catalyst, which Beta later had cleaned. ATSD at 2; Union/Fox Cmts at 21-22. The Union also noted that Beta’s SCR manufacturer “believes the SCR has achieved vendor guarantees, that the problem was not related to the SCR system, but rather upstream design flaws, and that the problem has been corrected.” ATSD at 2; Union/Fox Cmts at 21.

In informal comments submitted to IDEM on April 5, 1999, Region V notes that the Beta Steel catalyst contractor and “SCR expert,” Doug Hennigen, told the Region that “SCR is certainly technically feasible with the continuous nature, and size, of the SDI process.” Union Pet’n ex. 6-7 (Electronic Mail from Kushal Som, EPA Region V, to IDEM (Apr. 5, 1999)). EPA reiterates in its formal comments its view that SCR is

(continued...)

Region V observed that IDEM's economic analysis did not specify a dollar amount "by which one technology would be considered economically infeasible and another would be feasible" and noted that it had previously permitted "many controls for various units that have exceeded \$7500/ton of pollutant removed." Union Pet'n ex. 6-7 (Electronic Mail from Kushal Som, EPA Region V, to IDEM (Apr. 5, 1999)). Region V concluded by asserting that, with a cost analysis figure of \$4,300 per ton of NO_x removed, SCR should be BACT for the reheat furnace. ATSD at 2; COW Pet'n ex. 2, at 1 (Letter from Pamela Blakley, EPA Region V, to Paul Dubenetzky, IDEM (Apr. 30, 1999)) ("EPA Cmts").

In its response to the comments regarding technical feasibility, IDEM stated that "SCR operates best when inlet NO_x concentration and exhaust temperature are constant." ATSD at 2-3. IDEM then asserted that reheat furnaces are not steady-state processes with constant NO_x and temperature levels, so SCR would not be an appropriate control device for such a furnace. *Id.* at 3. IDEM stressed that Beta Steel continued to have operational problems and had not consistently been able to achieve its targeted ninety percent NO_x reduction. *Id.* Moreover, IDEM speculated that SDI's mill would have more difficulties with SCR than Beta's mill because Beta manufactures only one product, whereas SDI will manufacture a variety of steel products and thus will have more variable furnace firing rates and frequent steel roll changes, which will adversely affect the efficacy of an SCR system. *Id.* at 3-4. IDEM concluded by stating that it still questioned whether SCR is technically feasible in this context. *Id.* at 4; *see also* IDEM Resp. at 20 (arguing that IDEM determined "SCR may or may not be technically feasible").

On the economic side, IDEM at some point asked SDI "to provide a more detailed economic analysis" so that the Department could

³⁶(...continued)

technically feasible for steel reheat furnaces and is BACT for NO_x here. COW ex. 2 at 1.

respond to comments on the draft permit. IDEM Reply at 4. SDI proceeded to obtain SCR specifications from its reheat furnace vendor and transmitted those specifications to two SCR vendors, who subsequently supplied bids to provide a facility-specific SCR system. *Id.* After receiving this information, IDEM explained in the response-to-comments document that the \$4,300-per-ton figure it had relied on at the draft permit stage was based on a generic SCR system designed to meet eighty percent removal from a unit that met steady-state conditions. ATSD at 4. The facility-specific bids obtained by SDI revealed that the actual costs were substantially higher than IDEM's original \$4,300 estimate. Specifically, one vendor proffered a bid of \$19,000 per ton of NO_x removed (at ninety percent control efficiency), and the other bid, from the manufacturer of Beta Steel's SCR, came in at \$33,785 per ton (also at ninety percent control efficiency).³⁷ IDEM Reply at 4. Based on these figures, IDEM concluded that SCR was economically infeasible for the reheat furnace. ATSD at 4.

On appeal, petitioners allege that IDEM erred in eliminating SCR from contention and argue that, contrary to IDEM's findings, SCR is both technically and economically feasible. Union Pet'n at 23; *see* COW Pet'n at 11. Petitioners claim that in determining SCR's feasibility, IDEM failed to conduct a thorough and independent BACT evaluation and instead relied on inaccurate and misleading information provided by SDI. Union Pet'n at 24; COW Pet'n at 11. Amici, for its part, also criticize IDEM's treatment of this issue, arguing that SCR is technically feasible and that IDEM clearly erred in its consideration of SCR's economic feasibility for the reheat furnace. Amicus Br. at 19; Amicus Reply at 12-20.

As evidence that SCR is technically feasible, petitioners point to the experiences of Beta Steel in Portage, Indiana. Beta installed SCR

³⁷The ATSD erroneously reports this bid as \$35,192. *See* ATSD at 4; IDEM Resp. at 25 n.10 (acknowledging the "\$35,192 [figure] is the incremental cost effectiveness for SCR at 50% removal efficiency," not 90% removal efficiency).

technology on its reheat furnaces in 1992, and at least one of its stack tests, from March 10-11, 1999, indicates average NO_x emissions of 0.019 lb/MMBtu. Union Pet'n ex. 3, att. D. This actual emissions figure is well below the 0.11 lb/MMBtu NO_x limit IDEM established for SDI's reheat furnace. See Permit § D.5.1. As to economic feasibility, the Union alleges that SDI submitted "substantial additional information" on the cost-effectiveness of SCR after the public comment period closed on May 14, 1999. See Union Pet'n at 24 & ex. 6-8. This information included comparisons of the SDI and Beta reheat furnaces and a reheat furnace at Tuscaloosa Steel in Alabama; design data for SDI's reheat furnace; bids from two vendors (mentioned above) to purchase and install the SCR system at SDI's proposed mill; and revised estimates of SDI's SCR-related capital and operating costs. *Id.* ex. 6-8. The Union submitted its own analysis of this information on June 30, 1999, questioning much of the information and urging IDEM to gather additional data before making the final permit decision. Union Pet'n ex. 3. According to the Union, IDEM did not acknowledge its June 30th analysis in the response-to-comments document issued with the permit on July 7, 1999, but rather adopted the "technically flawed" and "misleading" information provided by SDI. *Id.* at 25.

Neither IDEM nor SDI dispute that IDEM received SDI's revised cost-effectiveness information after the close of the public comment period or that IDEM relied on SDI's newly submitted information in making its final BACT decision.³⁸ See ATSD at 3-4. As

³⁸IDEM explains the sequence of events as follows:

IDEM recognizes that Beta Steel has been able to achieve lower NO_x emissions with the use of SCR, and therefore when public comments asked IDEM to further investigate SCR, IDEM requested that SDI provide a more detailed economic analysis. A.C. Leadbetter & Son, Inc. ("Leadbetter"), the reheat furnace supplier, provided information to SDI relating to the design parameters of the SCR system. * * *

(continued...)

a result of its reliance on SDI's new information, IDEM's final NO_x BACT analysis for the reheat furnace is markedly different from its draft analysis. *Compare* TSD app. B at 9, 23-24 *with* ATSD at 2-4. For instance, IDEM reports the SCR bid information SDI relayed to it (i.e., estimates of \$19,000/ton and \$33,785/ton at ninety percent removal efficiency) and concludes on this basis that SCR is economically infeasible. In addition, as support for its reservations about SCR's technical feasibility, IDEM states that one of the two SCR bidders withdrew its bid when it determined that it could not guarantee seventy percent NO_x removal given the projected wide fluctuations in flue gas temperature and flow rate inputs to the SCR. ATSD at 4.

IDEM did not address in its response to comments the Union's detailed June 30th analysis of IDEM's revised BACT determination and underlying data. In that analysis, the Union raises numerous specific questions about IDEM's technical and economic SCR analyses, contending, for example, that the design parameters included in SDI's data are incomplete; that three months to a year or more of continuous operating data from other reheat furnaces should be reviewed; and that varying operating conditions and changes in product mix could be

³⁸(...continued)

Subsequently, SDI obtained two bids. Wheelabrator Air Pollution Control, Inc. ("Wheelabrator") submitted the first bid, which was later withdrawn for technical infeasibility. * * * The second bid was submitted by Huntington Environmental Systems, Inc. ("HES"), the same firm that designed Beta Steel's SCR. * * * The Union submitted information to IDEM claiming some of the costs were overestimated and unreasonable. * * * Consequently, SDI submitted the "Overly Conservative Estimated Capital and Operating Costs" to IDEM * * *.

IDEM Reply at 4-5 (citations omitted).

Amici set forth their own version of events in their reply brief. *See* Amicus Reply at 3-6. This chronology reveals that the vast majority of IDEM's economic analysis for SCR occurred after the close of the public comment period. *See id.*

accommodated through the use of permit conditions. Union Pet'n ex. 3 at 2-4. The Union also lists thirteen specific costs it believes were overestimated and gives facially plausible reasons for each such challenge. *See id.* at 5-9. Finally, the Union claims that because Wheelabrator Air Pollution Control Inc., the vendor that withdrew its SCR bid, is allegedly "not a major vendor of SCR systems and has not historically had a major presence in this field," SDI "should be encouraged to obtain price quotes and performance guarantees from other SCR vendors."³⁹ *Id.* at 9-10.

Petitioners and Amici raise several questions about the series of events summarized above, including: (1) whether IDEM complied with the procedural requirements of federal PSD permitting in this instance; and (2) whether IDEM reasonably decided, using its considered judgment, the substantive issues -- technical and economic -- pertaining to potential SCR application to SDI's reheat furnace. As to the first issue, the parties on both sides have strong views on whether or not IDEM committed procedural errors in its handling of the SCR data that was put into the record after the close of the public comment period. We find that, in light of our disposition of the issues in Part II.B.3.b.ii below, and in particular our decision to remand the BACT determination for the reheat furnace, it is not necessary to decide this question. The substantive questions, however, are addressed in turn below.

³⁹The Union notes that the Institute of Clean Air Companies, a nonprofit association of air pollution control companies, identifies Wheelabrator as a provider of many types of pollution control equipment (such as electrostatic precipitators, fabric filters, and flue gas desulfurization systems), but does not include the company on its list of SCR or SCR catalyst vendors. Union Pet'n ex. 3 at 9-10.

b. Substantive Issues**i. Technical Feasibility**

Under Step 2 of the top-down BACT guidance contained in the *NSR Manual*, a technology is considered to be “technically feasible” if it is “demonstrated,” meaning that it has been installed and operated successfully on the type of source under review. *NSR Manual* at B.17. If a technology is not demonstrated, then it will be deemed technically feasible only if it is commercially available and “applicable” to the equipment under consideration. *Id.* at B.17-.18. Applicability is generally assumed in cases where a commercially available control option has been or is soon to be deployed on the same or a similar source type. *Id.* at B.18. Indeed, “[d]eployment of the control technology on an existing source with similar gas stream characteristics is [a] generally sufficient basis for concluding technical feasibility barring a demonstration to the contrary.” *Id.* at B.18-19.

However, the *NSR Manual* further explains:

For process-type control alternatives the decision of whether or not it is applicable to the source in question would have to be based on an assessment of the similarities and differences between the proposed source and other sources to which the process technique had been applied previously. Absent an explanation of unusual circumstances by the applicant showing why a particular process cannot be used on the proposed source[,] the review authority may presume it is technically feasible.

Id. at B.19.

In this case, IDEM did not make a definitive decision about SCR’s technical feasibility. Instead, IDEM claimed that “Beta Steel has not been able to meet designed 90+% reduction[] [and, moreover,] has

inconsistently been able to achieve a level of reduction greater than that seen by low NO_x burner technology,” the technology chosen as BACT for SDI. ATSD at 3. IDEM also described anticipated variations in conditions at SDI’s reheat furnace as being more extreme than those at Beta Steel’s given the wide array of steel shapes to be produced at SDI.⁴⁰ *Id.* at 3-4. IDEM concluded by expressing its belief that “the problems at Beta would be magnified in a system such as proposed by SDI. For these reasons, [IDEM] questions whether SCR is technically feasible, but in any case does not believe that SCR would work as intended.” *Id.* at 4; *see also* IDEM Resp. at 20 (arguing that IDEM determined “SCR may or may not be technically feasible”).

The Union marshals a two-pronged attack on IDEM’s equivocal position on this issue. First, the Union challenges IDEM’s implicit conclusion that SCR is not “demonstrated” because it has not been entirely “successful” at Beta. According to the Union, “unrefuted source tests and other emission measurements separately placed into the record by each party demonstrate that [Beta Steel’s] SCR currently is

⁴⁰For example, the new analysis found SDI’s “walking beam” furnace to be substantially more variable than the “pusher” furnace used by Beta. Referencing a comparison of SDI’s and Beta’s reheat furnaces prepared by SDI, the Union explains the differences between the two types of furnaces as follows:

[T]he Beta furnace is a “pusher” furnace while the proposed SDI reheat furnace is a “walking beam” furnace. A pusher furnace is a batch furnace in which cold steel is manually “pushed” into the front end of a hot furnace and hot metal is pushed out the back end every 6 to 7 minutes. A walking beam furnace, on the other hand, is a continuous process that is electronically controlled. Steel moves constantly down the length of the furnace.

Union Pet’n ex. 3 at 3 (footnote omitted). Contrary to IDEM’s findings, the Union concludes that “typically, operating conditions should be much more variable and fluctuate substantially more in a pusher furnace than a walking beam furnace.” *Id.*

consistently achieving a NO_x limit of 0.02 lb/MMBtu.”⁴¹ Union Reply at 28 (citing five purported examples of such data). Second, the Union contends that the “unusual circumstances” IDEM describes are surmountable and do not merit a conclusion that SCR is not “applicable” to SDI’s furnace. In this regard, the Union raises a series of technical arguments challenging IDEM’s findings on SCR capabilities.⁴² *Id.* at 25-28. The Union also takes issue with SDI’s product mix, which it claims was changed after the close of public comment, and contends that the impact of these changes on permitted emission units and the BACT analysis was not subject to public review. Union Pet’n at 27-28.

In general, we accord deference to permitting agencies when technical issues are in play. As SDI rightly notes, the Board “assigns ‘a heavy burden to persons seeking review of issues that are quintessentially technical.’” SDI Reply at 9 (quoting *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 403 (EAB 1997)). In this case, however, we have the

⁴¹The Union also identifies four design flaws in the Beta Steel reheat furnace/SCR configuration and claims that “[c]onsultants to Beta expect that the resolution of these control issues will allow the SCR system to meet permit limits.” Union Pet’n at 24. The four purported design flaws are: (1) improper insulation used in upstream ducting disintegrated and clogged SCR catalyst; (2) NO_x control monitor was situated at SCR outlet rather than inlet, making it more difficult to control NO_x levels during transient conditions; (3) approximately 10 percent of exhaust flow bypassed the SCR system due to operator error; and (4) a section of heat exchanger tube sheet failed, resulting in exhaust temperatures lower than those required for optimal SCR operation. *Id.* at 23-24.

⁴²For example, the Union argues that IDEM has not substantiated its claim that SCR systems are not an appropriate control device for nonsteady-state processes. The Union lists several ways in which transient conditions could be accommodated, such as by employing premixing chambers to dampen NO_x fluctuations; using burners, fans, and/or heat exchangers to stabilize temperatures; choosing appropriate catalysts; and electronically coupling furnace burner operation to the SCR control system. Union Pet’n at 26. Another example involves the issue of catalyst plugging caused by high particulate levels, which the Union contends could be resolved by using a larger volume of catalyst with larger openings or by periodic cleaning. *Id.* at 28.

unusual situation in which we have no technical feasibility decision from the permitting agency (although we do have strong indicators that, if pressed, the agency might well make a finding of infeasibility). We also have the EPA regional office, which granted IDEM its delegated PSD authority, opining that SCR is technically feasible for this application. ATSD at 1-2; *see* Amicus Br. at 20; Amicus Reply at 4.

We do not find IDEM's nondecision on the technical feasibility question to be clearly erroneous or an abuse of discretion given the complexity of the issue and the fact that IDEM found SCR to be economically infeasible (irrespective of whether it is technologically infeasible). We therefore will not remand on the merits of this issue. However, absent a definitive decision by IDEM on remand regarding technical feasibility, it is appropriate for us to presume that SCR is technologically feasible.

ii. *Economic Feasibility*

In determining whether BACT for a pollutant should be based on a particular control technology, the permit issuer must consider the economic impacts of using that technology. 40 C.F.R. § 52.21(b)(12) (BACT definition); *see NSR Manual* at B.26 (economic feasibility considered in Step 4 of top-down BACT analysis). In general, a permit issuer will gauge economic impacts by estimating the average⁴³ and incremental⁴⁴ cost-effectiveness of various pollution control options, measured in dollars per tons of pollutant emissions removed. *See, e.g.,*

⁴³"The 'average cost-effectiveness' of a particular technology is calculated by dividing the average annualized cost of installing and operating the control technology by the tons per year of pollutant that the technology would remove." *In re Masonite Corp.*, 5 E.A.D. 551, 564 (EAB 1994) (citing *NSR Manual* at B.37).

⁴⁴"Incremental cost-effectiveness" is calculated by comparing the costs and emissions performance levels of one pollution control option to those of the next-most-stringent control option. *NSR Manual* at B.41.

In re Masonite Corp., 5 E.A.D. 551, 564 (EAB 1994); *NSR Manual* at B.31. The agency will then compare a control option's cost-effectiveness

with what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant. In most cases, a control option is determined to be economically achievable if its cost-effectiveness is within the range of costs being borne by other sources of the same type to control the pollutant. [*In re Inter-Power of New York, Inc.*, 4 E.A.D. 130, 135 (EAB 1994); *NSR Manual* at B.44.] "In the absence of unusual circumstance[s], the presumption is that sources within the same [source] category are similar in nature, and that [they can bear the same] cost[s] and other impacts." [*NSR Manual*] at B.29.

Masonite, 5 E.A.D. at 564.⁴⁵

⁴⁵The *NSR Manual* sets forth further guidance on this subject:

Before costs can be estimated, the control system design parameters must be specified. The most important item here is to ensure that the design parameters used in costing are consistent with emissions estimates used in other portions of the PSD application
* * * * *

To begin, the limits of the area or process segment to be costed [should be] specified. This well defined area or process segment is referred to as the control system battery limits. The second step is to list and cost each major piece of equipment within the battery limits. The top-down BACT analysis should provide this list of costed equipment. The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source [such

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In this case, IDEM's economic analysis is derived from information SDI submitted, at IDEM's request, IDEM Reply at 4, after the close of the public comment period. *See* Amicus Reply at 3-6 (chronology of events). The information consisted of reheat furnace design specifications compiled by A.C. Leadbetter & Son, Inc., the furnace vendor; letters and bids from the two SCR vendors; and estimated capital and operating cost projections provided by SDI (and apparently adopted by IDEM) for various NO_x control efficiency levels. *See* Union Pet'n ex. 6-8. As mentioned in Part II.B.3.a above, the vendors submitted bids of \$19,000 and \$33,785 per ton, respectively, for a site-specific SCR system targeted to achieve ninety percent removal of NO_x from the reheat furnace's exhaust stream. *See* ATSD at 4. IDEM relies on this information to conclude that SCR is not economically feasible for SDI's reheat furnace. *Id.*

In its June 30th comments and again on appeal, the Union raises numerous challenges to IDEM's economic analysis and underlying data. First, the Union claims the reheat furnace's design specifications, provided by Leadbetter, were incomplete, and therefore independent review of these important parameters was foreclosed.⁴⁶ Union Pet'n at

⁴⁵(...continued)

as the OAQPS Control Cost Manual (Fourth Edition), EPA 450/3-90-006, January 1990, Table B-4].

NSR Manual at B.32-.33.

⁴⁶In particular, the Union contends that the following information is needed to design and cost an SCR system for SDI: (1) average and maximum NO_x inlet and outlet concentrations or mass flow rates; (2) flue gas water and oxygen content; (3) exhaust temperatures; (4) ammonia slip; (5) particulate loading; (6) any pressure drop considerations; and (7) turndown ratios. Union Pet'n ex. 3 at 2. In addition, the Union points out that Leadbetter did not specify the flue gas NO_x rate of change, in pounds of NO_x per hour per minute, for various operational states of the reheat furnace. Without this information, the Union argues, there is "no support for the vendor quotes in the cost effectiveness analysis." *Id.*

28-29 & ex. 3 at 2-4. Second, the Union argues that the cost-effectiveness analyses contained in the record “grossly exaggerate the costs of SCR by using cost factors for other, more expensive technologies and innumerable technically flawed assumptions, documented in [Union Pet’n] Exhibit 3.”⁴⁷ Union Pet’n at 28. Third, the Union contends that the cost-effectiveness analyses failed to consider both average and incremental costs, contrary to the recommendations of the *NSR Manual* guidance. Union Pet’n at 29 (citing *NSR Manual* at B.41). Fourth, the Union claims IDEM failed to compare SDI’s projected costs to the costs incurred by other similar sources, again in contravention of *NSR Manual* guidance. *Id.* (citing *NSR Manual* at B.31-32).

Although the Union included many of these charges in its June 30th comments, IDEM addressed none of them in its response to comments. *See* ATSD at 1-4. IDEM therefore presents its first written responses in its appellate briefs. First, IDEM claims that an incremental cost analysis, which compares two or more control options, is “illogical and without meaning” because low-NO_x burners are built into rehear furnaces and allegedly cannot be separately costed and compared to a

⁴⁷In its June 30th comments (Union Pet’n ex. 3), the Union identified the following alleged overestimated or unnecessary costs: (1) \$56,000 for a “noise dampened compressor housing”; (2) \$80,000 for a “CEM ammonia system”; (3) \$206,000 for instrumentation (temperature probes, inlet flowrate, NO_x measurements); (4) \$103,000 for freight costs; (5) \$299,000 for foundations and supports; (6) \$996,000 for handling and erection of the SCR system; (7) \$747,000 for piping; (8) \$249,000 each for engineering/supervision and construction/field expenses; (9) \$99,000 per year plus benefits for 1.5 full-time SCR operators; (10) \$360 per ton for ammonia, including vaporizer rental; (11) \$249,000 for emergency response training; (12) \$125,000 every two years for catalyst replacement; and (13) \$457,000 for overhead. Union Pet’n ex. 3 at 6-9; *id.* ex. 6-8. In each case, the Union provided a facially plausible explanation of why the costs were overestimated or not needed or requested further documentation. *See id.* ex. 3 at 6-9.

stand-alone system such as SCR.⁴⁸ IDEM Resp. at 23-24. Second, IDEM claims that it did provide average and incremental cost estimates, contrary to the Union's charge. *Id.* at 24; *see id. ex. E.* Third, IDEM contends that Leadbetter, the reheat furnace vendor, supplied adequate design specifications to the two SCR vendors, enabling the SCR vendors to design and cost their SCR systems accurately. *Id.* at 24. Finally, IDEM claims that SDI's final revised cost estimate, which is titled "Overly Conservative Estimated Capital and Operating Costs," contained changes to SDI's original estimate that were based on the Union's June 30, 1999 comments. *Id.* at 25. According to SDI, even after it incorporated "most" of the Union's "unrealistic and unfounded" assumptions in the estimate, it still computed SCR's cost-effectiveness as a "staggering" \$19,546 per ton of NO_x removed. SDI Resp. at 48-49.

Amici weigh in on the Union's side, claiming that the economic analysis contains no comparison of SCR costs to those of similar sources. Amicus Br. at 26. Amici also argue that cost data for the major pieces of equipment within the SCR system are lacking. *Id.* at 22, 26. Amici state:

Considering that SDI's cost effectiveness escalated dramatically from \$4,300 to over \$30,000, then reduced to a purportedly final figure of \$19,546, calculated after close of public comment period, and that no cost comparison with similar sources or any costs or basis for costs of major pieces of equipment was provided, more comprehensive and detailed project cost data should have been provided.

⁴⁸The Union disputes this, stating that "low-NO_x burners are never 'inherently part of' any piece of fired equipment, including heaters. They are typically separately manufactured by specialty vendors and are never used unless required for regulatory purposes because they are more expensive than conventional burners." Union Reply at 23-24 (footnote omitted).

Id. at 26 (supporting argument by quoting *NSR Manual* at B.35, which states, “[W]here initial control cost projections on the part of the applicant appear excessive or unreasonable (in light of recent cost data)[,] more detailed and comprehensive cost data may be necessary to document the applicant’s projections.”).

We agree with the Union’s and Amici’s assessment of this situation. The *NSR Manual* suggests that where the top pollution control candidate -- here SCR -- is found to be inappropriate due to economic impacts, the rationale for the finding should be “fully documented for the public record.” *NSR Manual* at B.29; see *In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 15 (EAB, Feb. 4, 1999), 8 E.A.D. ___ (“A permitting authority’s decision to eliminate potential control options * * * due to collateral impacts[] must be adequately explained and justified.”). IDEM has not fully documented, for public review, its economic analysis. We have been unable to detect, nor have we been directed to, any information in the administrative record about SCR costs at other steel mills or other facilities. Yet this kind of information is recommended for inclusion in a complete and thorough cost-effectiveness analysis.⁴⁹ *NSR Manual* at B.31-.32, .35; see *In re Masonite Corp.*, 5 E.A.D. 551, 564 (EAB 1994) (cost-effectiveness data are “compared with what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant”); *In re Inter-Power of New York, Inc.*, 5 E.A.D. 130, 149 (EAB 1994) (absence of comparative cost-effectiveness data “makes a cost-effectiveness determination more vulnerable to attack”).

⁴⁹SDI disputes the contention that cost-comparison data are required as part of the BACT economic analysis. SDI Reply at 15. As support, SDI argues that our decision in *Masonite* “found that a permitting agency could *not* use other facilities’ cost estimates as a basis for its BACT determination.” *Id.* at 15 n.20. *Masonite* simply cannot be read to support such a broad proposition. See *In re Masonite Corp.*, 5 E.A.D. 551, 563-69 (EAB 1994) (finding that other facilities were not similarly situated to *Masonite* because they did not already have regenerative thermal oxidizer technology installed on-site); see also *id.* at 567 n.22 (“We reject [petitioner’s] argument that [cost] comparisons to other facilities are irrelevant.”).

IDEM and SDI argue that no cost data exist for Beta Steel's SCR because Beta adopted the technology voluntarily; IDEM and SDI also contend that no other similar facilities exist. IDEM Reply at 6-7; SDI Reply at 15. Amici rightly point out that IDEM could have -- and indeed should have -- asked Beta's SCR vendor to describe whether, how, and why SDI's SCR cost estimate differed from Beta Steel's. Amicus Reply at 19. In addition, Amici note that several other recent NO_x BACT analyses have been conducted for reheat furnaces, and "[t]hrough these facilities rejected SCR, an explanation of the differences between SDI's estimate and these estimates still could have been [provided]." *Id.* Finally, in light of the fact that SDI's cost-effectiveness estimate appears to be five-to-ten times higher than any of five recent reheat furnace/SCR estimates calculated for other steel mills (which Amici found ranged from \$3,000 to \$6,000 per ton of NO_x removed, *id.* at 17-18), IDEM should have carefully investigated and independently evaluated the cost analyses submitted by SDI.

We have also found in the record and briefs no costing information on the major pieces of equipment within the SCR system. According to SDI's analysis, that equipment consists of "catalyst, housing, ammonia injection grid, internal support structure, housing and frame, inlet ductwork, and ammonia/air dilution skid." Union Pet'n ex. 6-8 (Estimated Capital and Operating Costs tables). IDEM and SDI suggest that it is impossible to separate out these costs, *see* IDEM Reply at 6; SDI Reply at 15, but surely at least some of the figures, such as catalyst costs, could be independently priced.⁵⁰

In this case, it is important to specify these costs, to the greatest extent possible, not only because the *NSR Manual* suggests doing so is part of a sound economic analysis, *see NSR Manual* at B.32-.33, but also because of the multiplying effect the costs have on the rest of the

⁵⁰According to SDI's economic analysis, catalysts must be replaced on a regular basis. *See* Union Pet'n at ex. 6-8 (Estimated Capital and Operating Costs tables) (specifying costs for catalyst replacement every two or six years).

analysis. Thirteen of the other items listed in SDI's estimated cost tables are determined as percentages of the total purchased equipment cost ("PE"), of which the SCR cost is the largest component. For example, in SDI's "Overly Conservative Estimated Capital and Operating Costs" table, the total PE is \$5,483,500. The SCR portion of this figure is \$5,250,000. Cost items such as "engineering and supervision," "construction and field expenses," and "contractor fees" are each calculated as ten percent of PE, or \$548,000 each.⁵¹ See Union Pet'n ex. 6-8. One only need compare these costs to those contained in the original cost estimate, which were \$249,000 for each of these three cost items (based on a total PE of \$2,489,000), to understand how important it is that the PE estimate be as accurate as possible.

For the foregoing reasons, we agree with the Union and Amici that IDEM's decision to reject SCR on economic infeasibility grounds was clearly erroneous because IDEM's cost-effectiveness analysis was incomplete. See *Knauf*, slip op. at 28, 8 E.A.D. ___ (finding BACT determination incomplete and therefore clearly erroneous because permitting agency rejected legitimate questions on the particular design of BACT without any explanation); *Masonite*, 5 E.A.D. at 566 (BACT decision clearly erroneous because based on incomplete cost-

⁵¹We note that SDI did not adjust its 10%-of-PE estimate for these items, despite its claim to have incorporated most of the Union's comments into the Overly Conservative Estimated Capital and Operating Costs table. In its June 30th comments, the Union had stated:

The engineering/supervision and construction/field expenses are *both* estimated as 10% of the PE [for a total of 20%], based on the OAQPS Manual. However, * * * SCR systems are relatively simple compared to most pollution control systems[, consisting only of a reactor, catalyst, and ammonia grid and control system]. Thus, they are inexpensive to engineer and build. Costs to design and construct an SCR system is typically no more than 10% of the [PE costs].

Union Pet'n ex. 3 at 7 (nos. 6, 8) (emphasis added).

effectiveness analysis). We therefore remand this issue to IDEM for reconsideration.

c. Remand Conditions

On remand, IDEM is directed to perform a complete analysis of SCR's cost-effectiveness, including comparisons of costs to other facilities and to other technologies,⁵² *see NSR Manual* at B.31-.46, document its findings, submit those findings to public review, and consider and respond to significant public comments in its documentation of the final permit decision. In executing this task, IDEM must consider comments currently in the record, including the Union's June 30th comments, as well as any new comments received on reproposal. If IDEM decides to base its decision on the ground that SCR is technically infeasible, and thus an economic infeasibility analysis is unnecessary, the Department must nonetheless consider and respond to all significant technical feasibility-related comments currently in the record in the documentation of its final permit decision.

4. BACT for PM Emissions from Slag-Handling Operations

Next, petitioners challenge IDEM's analysis of BACT for SDI's slag-handling operations. Slag, a mixture of lime, silica, and other impurities found in iron ore and scrap metal, is a natural byproduct of the steelmaking process. Slag is separated from molten steel exiting the blast furnace, poured into slag pots, and transported to a mill's slag-processing

⁵²For instance, we note that IDEM originally found SNCR to be technically feasible but rejected it after finding its cost-effectiveness to be \$5,300 to \$5,700 per ton of NO_x removed. TSD app. B at 24. Because these numbers fall within the range of costs Region V has found to be economically feasible, and because this has not been refuted by IDEM, we would expect IDEM would compare and contrast SCR costs to those of SNCR, as well as to any other top options. We would also expect that IDEM would evaluate the five steel mills Amici reviewed and found had anticipated SCR costs of \$3,000 to \$6,000, as well as any other steel mills or other relevant facilities that have recently examined -- and costed -- SCR application to their reheat furnaces.

area. There, the molten slag is dumped into pits, cooled with water, excavated, crushed, and screened to desired aggregate sizes for off-site use or disposal. Union Pet'n ex. 7. Dry, solidified slag, called "skull," is typically added to the bottom of slag pots to aid in molten slag removal, and the skull is periodically dumped into skull slag pits and reused. Union Pet'n at 30.

Particulate matter is emitted at many points during these slag operations. According to IDEM, PM emissions

will be associated with slag pot dumping, deskulling, slag cooling, digging of slag pits by a front-end loader, loading of grizzly feeder by a front-end loader, crushing, screening, conveyor transfer points, loading of materials into piles, wind erosion of storage piles, load out of materials from piles, and vehicle movement around piles. All [PM] emissions from slag handling and processing will be fugitive in nature.

TSD app. B at 26.

IDEM determined that BACT for PM emissions from these operations would consist of the use of skull slag to suppress emissions during dumping of molten slag into pits; water suppression using spray bars and other means; minimization of slag drop heights;⁵³ a roofed, open-sided enclosure over the slag-dumping pits; and associated visible emissions limits for each operational stage. ATSD at 12-13; Permit

⁵³During slag-handling and -processing operations, slag is repeatedly scooped up in one location and dumped in another. "Drop height" refers to the vertical distance slag is dropped during these transfer operations. See Permit att. A § 5 (Fugitive Dust Control Plan) (front end loader-to-truck drop height must be less than 48 inches; slag stacker-to-slag pile drop height must be less than 48 inches; skull slag-to-slag pot drop height must be minimized).

§ D.7.4 & att. A (Fugitive Dust Control Plan); TSD app. B at 27. The BACT requirements are summarized in the following table:

Slag Handling/Processing Operation	Control Measure	Visible Emission Limitation (% opacity)
Transferring of skull slag to slag pot	Minimizing the drop height by dumping the slag skull slowly	3% opacity on a six-minute average
Pouring of liquid slag from EAF or ladle metallurgical station ("LMS") to slag pots	EAF/LMS baghouse	3% opacity on a six-minute average
Transporting of slag pot with liquid slag to pot dumping station	<i>see</i> BACT for roadways	<i>see</i> BACT for roadways
Dumping of liquid slag from slag pot to slag pit and cooling	Skull slag from the bottom of the slag pot will suppress PM emissions during dumping and applying water; partial enclosure with roof extending over entire slag pit area will also reduce PM emissions	3% opacity on a six-minute average
Transferring of skull slag from slag pot to skull pit	None -- due to safety reasons. The skull is reused and water in the skull can cause an explosion during pouring of liquid slag into the slag pots	3% opacity on a six-minute average
Digging slag and skull slag pits	water suppression	3% opacity on a six-minute average
Stockpiling of slag adjacent to the grizzly feeder	water suppression	3% opacity on a six-minute average
Wind erosion of stockpiles	water suppression	3% opacity on a six-minute average
Crushing	water suppression via spray bars	3% opacity on a six-minute average

Screening	water suppression via spray bars	3% opacity on a six-minute average
Conveyor transfer points	water suppression via spray bars	3% opacity on a six-minute average
Continuous stacking of processed slag to stockpiles	water suppression via spray bars and minimizing the drop heights	3% opacity on a six-minute average
Load-out of processed slag from stockpiles to haul trucks for off-site shipment	water suppression	3% opacity on a six-minute average
In-plant hauling of slag pots (filled) and processed slag	water suppression of processed slag or tarping of haul trucks	3% opacity on a six-minute average

See TSD app. B at 27, *as modified by* ATSD at 12-13 & Permit §§ D.7.1, D.7.4 & att. A. In addition, IDEM placed a limitation on SDI’s annual production of slag to ensure that total PM emissions from slag handling and processing would not exceed 10.9 tons per year. See Permit § D.7.1 (SDI may not process more than 262,800 tons of slag per year).

Petitioners contend that IDEM erred in conducting the slag-handling BACT analysis because the Department allegedly: (1) failed to consider all available slag-handling controls; (2) relied on a flawed cost-effectiveness analysis; and (3) underestimated slag-handling emissions. Union Pet’n at 32-41; COW Pet’n at 12-13. Each of these contentions is addressed in turn below.

a. Consideration of All Available Slag-Handling Control Options

First, petitioners contend that IDEM failed to identify all available PM control options, in contravention of the top-down BACT guidance set forth in the *NSR Manual*. Union Pet’n at 32; COW Pet’n at 12; *see*

NSR Manual at B.5 (first step in top-down analysis is to identify all “available” control options, which are “those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation”). The Union claims that five viable control options were mentioned in materials placed in the administrative record after the close of public comment and should have been, but were not, evaluated: (1) strategically placed spray bars; (2) “excellent” pit watering practices; (3) controlling, in the melt shop, input into slag pots; (4) creating a mist shroud around slag pits; and (5) complete enclosure of the entire slag-handling operation from slag transport to slag load-out. Union Pet’n at 33; *see id.* ex. 6-12, -13 (letters relating other steel mills’ experiences).

The Union also charges that IDEM failed to consider and/or explicitly investigate: (1) spray bars for use in controlling PM emissions from slag transport, dumping, excavation, and other slag-handling operations besides crushing, screening, conveying, and stacking; (2) pit watering to reduce PM emissions (rather than simply to cool molten slag); (3) alternative controls to use when watering is not feasible due to weather conditions; (4) potential trapping of hydrogen sulfide, a toxic gas released during slag quenching, by the partial, roofed enclosure over the slag pits; (5) complete enclosures of the type purportedly in use at Beta Steel in Portage, Indiana, USX Steel in Gary, Indiana, and a steel mill in Thailand; (6) enclosure of slag-processing operations such as conveying, crushing, and stockpiling; (7) methods to ensure the forty-eight-inch drop height specified in SDI’s Fugitive Dust Control Plan is achieved; and (8) use of gravity-feed-plow reclaimers, rake reclaimers, bucket wheel reclaimers/sprays to control storage pile load-out emissions. Union Pet’n at 33-38. COW, for its part, claims that IDEM failed to consider electrostatic precipitators, high-efficiency cyclones, and high-energy scrubbers in this BACT analysis. COW Pet’n at 12-13.

IDEM’s response to this flurry of arguments is simple: the Department asserts that the issue of its purported failure to consider all available control options was not raised during the public comment period, despite being reasonably ascertainable at that time. IDEM Resp. at 26;

accord SDI Resp. at 52-53. IDEM explains that the only comments submitted regarding other controls pertained to total enclosure of the slag-handling operations. IDEM Resp. at 26; *see* ATSD at 11-12, 52. Noting that the Board generally requires issues reviewed on appeal to have been raised with specificity during the comment period, IDEM argues that none of the issues identified by petitioners have been preserved for review by the Board, except those issues related to partial enclosure of the slag pits (a new condition in the final permit) or total enclosure of all slag operations (raised during the public comment period). IDEM Resp. at 26-27 (citing 40 C.F.R. §§ 124.13, .19; *In re RockGen Energy Center*, PSD Appeal No. 99-1, slip op. at 7 (EAB, Aug. 25, 1999), 8 E.A.D. ___; *In re Pollution Control Indus. of Ind., Inc.*, 4 E.A.D. 162, 166-69 (EAB 1992)).

As to those issues, IDEM asserts that it considered and rejected the possibility of conducting slag dumping inside the melt shop because of the high costs of controlling a small amount of emissions. IDEM Resp. at 27 (citing TSD app. B at 27). IDEM also rejected total enclosure of the slag pits because of health and safety concerns but accepted partial enclosure because natural ventilation alleviated the severity of such concerns.⁵⁴ *Id.* at 29 (citing ATSD at 13; Union Pet'n ex. 6-13). Finally,

⁵⁴IDEM explained:

The applicant has concerns regarding total enclosure of [the slag dumping area] due to possible visibility and safety concerns which could occur. Although[] this operation does not have large amounts of [PM] emitted, when trapped in an enclosure with large amounts of moisture and heat, a dense fog can be created inside the structure which would risk the visibility and safety of workers. Heat dissipation is also a concern with a total enclosure being used for control. SDI is concerned that a structure built adequately to allow exhaustion to a baghouse would come into such close proximity to the slag that melting of supports and walls over a period of time would make the structure a hazard.

(continued...)

IDEM states that it considered enclosures of specific slag-handling equipment, such as feeders, crushers, and conveyors, but determined that the visible emissions limits it established for the equipment would dictate whether enclosure would be needed to achieve compliance. *Id.* Therefore, IDEM concludes that petitioners' claims are unfounded.

SDI supports IDEM's analysis and conclusions, *see* SDI Resp. at 49-56, as do Amici, who contend that the record does not support petitioners' view that IDEM clearly erred in its consideration of available control options. Amicus Br. at 29. To the contrary, Amici argue that the record clearly documents IDEM's consideration of most of the control options identified by petitioners. *See id.* (citing portions of TSD, ATSD, and Permit as proof that IDEM considered fugitive dust control, spray bars, pit watering, partial and complete enclosure, and enclosure of conveyor belts). For its part, IDEM argues that it considered most of the questioned controls and is requiring that SDI implement those or superior controls. IDEM Resp. at 28 ("SDI will be using spray bars, pit watering practices, and will be partially enclosing slag pits and using water suppression, rather than creating a mist shroud").

IDEM is correct in recognizing that reasonably ascertainable issues must be raised during the public comment period or are lost to review. *See* 40 C.F.R. § 124.13 (all reasonably ascertainable issues and reasonably available arguments supporting a position must be raised by close of public comment period); *see also In re Spokane Regional Waste-to-Energy*, 2 E.A.D. 809, 816 (Adm'r 1989) (agency's opportunity to respond to significant comments is meaningless unless interested parties clearly state their positions during public comment period). Upon review of the administrative record and all arguments pertaining to slag-handling operations, we agree that none of the control options or techniques mentioned in the petitions -- other than complete and partial enclosure of the slag dumping area and enclosure of slag-

⁵⁴(...continued)

ATSD at 13.

processing equipment -- were raised during the public comment period. Moreover, we have no reason to believe that these other issues were not reasonably ascertainable during that time. *See In re Keystone Cogeneration Sys., Inc.*, 3 E.A.D. 766, 766 (Adm'r 1992) (petitioner must demonstrate that issues raised on appeal were raised during comment period or were not reasonably ascertainable at that time); 40 C.F.R. §§ 124.13, .19(a).

With respect to the arguments that were preserved for review, petitioners have failed to establish clear error or abuse of discretion in IDEM's evaluation of slag-handling control options. In accordance with the PSD permitting rules, 40 C.F.R. § 124.17(a)(2), IDEM evaluated all options timely brought to its attention by commenters and documented its findings in the record. *See* ATSD at 11-13, 52 (discussing complete and partial enclosure of slag dumping area and enclosure of slag-processing equipment); TSD app. B at 26-28 (discussing enclosure option). We therefore deny review of IDEM's alleged failure to consider available slag-handling control options.

b. Cost-Effectiveness Analysis

Second, the Union finds fault with IDEM's reliance on SDI's estimate that complete enclosure of the slag dumping area would cost \$61,000 per ton of PM removed.⁵⁵ The Union contends that SDI submitted this estimate after the comment period closed and thus the estimate has not been subject to public review. Union Pet'n at 38. The Union also contends that the estimate is wholly unsupported, with the design basis, vendor quotes, and enclosure descriptions all conspicuously absent. *Id.* at 38-39. Moreover, the Union argues that SDI's analysis is based solely on average costs and does not include consideration of incremental costs, although *NSR Manual* guidance suggests both types

⁵⁵SDI estimated that total enclosure of the slag dumping area with baghouse control would cost \$16,000 per ton, assuming 52.56 tons of PM removed, ranging up to \$61,000 per ton, assuming 13.8 tons of PM removed. SDI Resp. at 56.

of costs should be considered. *Id.* at 39. Finally, the Union argues that the cost-effectiveness analysis is grossly overestimated and unreasonable, and thus more detail is warranted to document SDI's cost projections. *Id.* (citing *NSR Manual* at B.35).

In response, IDEM notes rhetorically that even assuming SDI's projections are double the actual costs, the average cost-effectiveness would still be over \$30,000 per ton and economically infeasible. IDEM Resp. at 30. IDEM then asserts that a specific incremental cost analysis is not necessary because most steel mills conduct slag-handling operations outdoors, and the cost of constructing and maintaining an enclosure with a baghouse is on its face significantly more expensive than outdoor control operations. *Id.* at 30-31. IDEM concludes that it did not err in determining that complete enclosure of the slag-handling operations would be economically infeasible. *Id.* at 31.

Citing Board precedent, Amici agree that where “the cost of employing a particular technology may be so obviously excessive in relation to the removal efficiency of the technology,” the technology may be rejected without engaging in exhaustive cost-effectiveness calculations. Amicus Br. at 30 (quoting *In re Masonite Corp.*, 5 E.A.D. 551, 566 (EAB 1994)). According to Amici, IDEM sufficiently demonstrated that baghouse controls for a slag enclosure would not control PM emissions in a cost-effective manner. *Id.*

We note that “if a particular technology has a cost that is exceptionally high relative to another technology, but has only a negligibly higher emissions reduction efficiency, its greater cost (economic impact) might justify rejecting it as BACT.” *In re World Color Press, Inc.*, 3 E.A.D. 474, 480 n.18 (Adm'r 1990). Here, IDEM estimated that “the difference in controlled emissions between the use of a baghouse and wet suppression would only be 0.003 tons per year.” TSD app. B at 27. In such a case, it is facially clear, as IDEM contends, that the costs associated with constructing and maintaining a complete enclosure of the slag dumping area are unduly high when compared to the costs of more modest but nearly equally efficacious water-based controls. We find no

clear error or abuse of discretion in IDEM's reliance on SDI's cost estimates, even though the estimates do lack the details the Union alleges. *Cf. In re Genesee Power Station*, 4 E.A.D. 832, 845-48 & nn.13-14 (EAB 1993) (requiring electric power plant to spend more than \$5 million to reduce PM emissions by 23 tons per year is not cost-effective).

c. Slag-Handling Emissions Estimates

Third, petitioners argue that IDEM substantially underestimated PM emissions from SDI's slag-handling operations. The Union contends that IDEM's estimates assume fifty percent control for slag and skull dumping, achieved via water suppression and by placing skull in the bottom of the slag pots to facilitate slag removal. Union Pet'n at 40. The Union found no evidence in the record that watering and skull use would be optimized to reduce PM emissions, as opposed to cooling and aiding in the removal of slag. Thus, the Union concludes that no reduction in emissions is warranted for these two operations. *Id.* The Union also objects to IDEM's assumption that only a single slag drop will occur. According to the Union, slag will be dropped at least seven times: from pit excavators into trucks; from trucks into storage piles; from storage piles into grizzly feeder; from grizzly feeder into crusher; from crusher onto conveyors/screens; from stacker into storage piles; and from storage piles into trucks for off-site transport. *Id.* at 40-41. The Union therefore concludes that IDEM's drop emissions estimate is seven times less than actual emissions. *Id.* at 41. Finally, the Union claims that IDEM's estimate excludes six sources of fugitive emissions: (1) adding/removing skull to/from slag pot; (2) excavating cooled slag from slag pits; (3) wind erosion of stockpiles; (4) crushing; (5) conveying; and (6) transporting slag within the facility. *Id.* According to the Union, the "underestimated emissions bias the cost-effectiveness analysis, making attractive slag-handling control options appear to be economically infeasible." *Id.* at 39-40.

IDEM defends its analysis by pointing out that the Union's arguments are based on IDEM's original slag calculations, which are

printed in Appendix A of the TSD but were substantially altered for the final permit. IDEM Resp. at 31. IDEM recalculated SDI's slag-handling emissions in accordance with factors provided by EPA during the comment period, adjusted to include the correct slag production total.⁵⁶ See IDEM ex. F (Region V e-mail to IDEM regarding predictive emission factor equations for SDI's slag-handling operations). IDEM adopted EPA's suggested emission factors for PM emissions from the tops of slag pots, from slag/skull dumping, and from slag processing; in so doing, IDEM claims that all emissions from slag-handling operations were encompassed in its calculus. IDEM Resp. at 32. IDEM also adopted more conservative control estimates based on EPA's comments, choosing fifty (rather than ninety) percent control for the dumping of slag and skulls due to water suppression and skull slag use, even though the slag pit will also be partially enclosed. Moreover, IDEM assumed no control for emissions from the top of the slag pots during transport and fifty percent control for enclosure and water suppression of slag processing operations. *Id.* Amici conclude from this that petitioners have not shown IDEM's final estimate, which uses these multiple conservative assumptions, underestimates actual emissions. Amicus Br. at 31.

IDEM considered the parties' comments on this issue and recalculated its emissions estimates in accordance with suggestions from EPA Region V. IDEM's analysis appears to incorporate a number of conservative assumptions, purportedly to ensure that emissions are not underestimated and the cost-effectiveness analysis not unduly biased. See ATSD at 11-12; IDEM ex. F. The matters at issue here are essentially technical, and we have historically deferred to a permit agency

⁵⁶EPA Region V submitted comments on the draft permit claiming IDEM had substantially underestimated slag-handling emissions of PM. See ATSD at 11. After reviewing EPA's calculations, IDEM explained that EPA had used an incorrect yearly-slag-processed figure. EPA used the steel production capacity of 200 tons per hour to determine slag emissions, but according to IDEM "a very conservative estimate would give 15% slag produced for every ton of steel," for a total of 262,800 tons of slag per year. *Id.* at 12.

on issues -- such as this one -- heavily dependent on that agency's technical expertise. *See, e.g., In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (EAB 1998) (“Board traditionally assigns a heavy burden to persons seeking review of issues that are quintessentially technical”) (quoting *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 403 (EAB 1997)), *review denied sub nom. Penn Fuel Gas, Inc. v. U.S. EPA*, 185 F.3d 862 (3d Cir. 1999). Petitioners’ arguments here were premised on an outdated calculation and did not take into account IDEM’s revisions based on EPA’s suggested predictive emission factor equations. *Compare* TSD app. A at 3-4 *with* ATSD at 12 *and* IDEM Resp. ex. F. As a result, we find that petitioners have not carried their burden of showing clear error or abuse of discretion on IDEM’s part. We therefore deny review on this ground.

C. *Enforceability Issues*

Moving on from their direct challenges to IDEM’s BACT determinations, petitioners next target the enforceability of numerous BACT-related provisions in SDI’s permit. As foundation for their arguments, petitioners rely on EPA guidance in the *NSR Manual*, which states:

To complete the BACT process, the reviewing agency must establish an enforceable emission limit for each subject emission unit at the source and for each pollutant subject to review that is emitted from the source. * * *

* * * BACT emission limits or conditions must be met on a continual basis at all levels of operation (e.g., limits written in pounds/MMbtu or percent reduction achieved), demonstrate protection of short term ambient standards (limits written in pounds/hour), and be enforceable as a practical matter (contain appropriate averaging times, compliance verification procedures and recordkeeping requirements).

NSR Manual at B.56; *see* Union Pet'n at 41-42 (quoting *NSR Manual*).

According to petitioners, SDI's permit has nine categories of unenforceable permit provisions: (1) single emissions limits for multiple commonly vented emissions units; (2) emissions limits that cannot ensure continuous compliance at all levels of operation; (3) raw material sulfur limits; (4) no continuous emissions monitoring requirements for SO₂ or NO_x; (5) slag production and emissions limits; (6) transportation fugitive dust conditions; (7) limits on NO_x, SO₂, and PM emissions from the EAF; (8) lead limits; and (9) the Preventative Maintenance Plan requirement. Union Pet'n at 42-61; COW Pet'n at 13-15. Petitioners take the position that "[t]he heart of the PSD permitting process is establishing enforceable limits to ensure that BACT determinations are implemented and compliance with permitted emission levels may be adequately determined." COW Pet'n. at 13; *see* Union Pet'n at 41. "Without enforceable limits," petitioners continue, "the permit is a hollow promise." Union Pet'n at 41.

Amici echo many of petitioners' concerns, contending that "if the Board finds the permit limits cannot be enforced as a practical matter to ensure compliance on a continuous basis at all levels of operation, remand is required. Amici believe IDEM is entitled to discretion in formulating the mechanisms by which it will achieve these requirements. The failure to include any adequate mechanisms, however, is an abuse of discretion and should be held to be clear error." Amicus Reply at 22; *see* Amicus Br. at 32 n.19 (referencing EPA guidance on practical enforceability and maintaining that "the very definition of 'emission limitation' in section 302(k) of the [CAA] refers to a requirement '[that] limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.' * * * This subsumes the practical ability to determine whether a limit is being met on a continuous basis.") (quoting CAA § 302(k), 42 U.S.C. § 7602(k)).

With this as background, we address each of petitioners' nine contentions below.

1. *Venting Multiple Emission Units Through a Single Stack*

First, petitioners identify several emissions units that, as presently configured, will vent through a common stack but purportedly without provision for separate emissions limits or compliance procedures for the differing units. Specifically, the ladle metallurgical station (“LMS”), continuous caster, and EAF will all vent to the EAF baghouse stack, while four ladle preheaters, one ladle dryer, one tundish nozzle preheater, two tundish preheaters, and one tundish dryer (“heaters/dryers”) will vent to the melt shop roof monitor. Permit §§ D.2-.4. In the permit, IDEM limits SDI’s emissions of filterable PM from each of the LMS and the caster to 58.5 pounds per hour, whereas SDI’s emissions of NO_x from each of the nine heaters/dryers is limited to 0.1 pounds per MMBtu. *Id.* §§ D.2.2, D.3.1, D.4.2. Petitioners claim, however, that the permit contains “no compliance procedures whatsoever” for either the LMS or the caster individually.⁵⁷ Union Pet’n at 44. Petitioners also note that the permit “boldly proclaims that ‘[t]esting of the [heaters/dryers] is not required.’” *Id.* Thus, petitioners conclude that IDEM has erroneously failed to establish enforceable permit limits for these eleven emissions units. *Id.*; *see* COW Pet’n at 13.

a. *LMS/Continuous Caster*

To establish that the LMS/caster issue was raised during the public comment period (and thus may be reviewed as part of this appeal), the Union quotes a comment submitted by EPA: “Since the continuous caster, [LMS,] and the EAF are all emitting through one stack, a compliance limit needs to be established based upon the tightest emissions limitation of the three.” ATSD at 27. The Union then claims that IDEM “wholly ignored” this EPA comment in its response-to-comments document. Union Pet’n at 43.

⁵⁷The compliance provisions for the LMS and caster both refer to Section D.1 of the permit, which addresses the EAF only. *See* Permit §§ D.1, D.2.2, D.4.2.

IDEM protests that it did not ignore EPA's comment but rather contacted the Agency, which purportedly explained that its concern hinged on the selection of a pounds-per-hour limit rather than a pounds-per-ton limit (a limit potentially more effective at controlling emissions when the mill runs at less than full capacity).⁵⁸ IDEM Resp. at 35. IDEM asserts that it responded to EPA's comment by amending Section C.5 of the permit to require SDI's consistent implementation of air pollution controls, operating practices, and raw material quality standards regardless of facility production rate.⁵⁹ *Id.*; *see* Permit § C.5. IDEM goes on to claim that any establishment of separate operational or fuel input limitations or other monitoring procedures for the EAF, LMS, and caster "would be tantamount to IDEM redefining the SDI source[.]"

⁵⁸We note that none of this information is presented in the response-to-comments document. *See* ATSD at 27-29.

⁵⁹Section C.5 states, with respect to operation of equipment throughout the steel mill:

Except as provided otherwise, all air pollution control equipment listed in section D of this permit and used to comply with an applicable requirement shall be operated at all times that the emission units vented to the control equipment are in operation. The air pollution controls, operating practices, and quality of the raw materials shall be consistently implemented so as to not reduce the effectiveness of air pollution controls as required in [s]ection D regardless of the production rate of the facilities regulated by this permit. This includes, but is not limited to, the sulfur content of raw materials, the operation of the thermal oxidation and negative pressure at the DEC air gap, the oil content and other quality control parameters of the scrap management program, fan amperage consistent with furnace operating mode, and burner operation.

Permit § C.5.

which is inconsistent with the PSD rules and the NSR Manual.”⁶⁰ IDEM Resp. at 35 (citing *In re Hawaiian Commercial & Sugar Co.*, 4 E.A.D. 95, 99 (EAB 1992)). Finally, IDEM argues that nothing in the *NSR Manual* suggests that specific permit limits (here, 0.0018 gr/dscf for filterable PM and 0.0052 gr/dscf for total PM from the EAF stack), accompanied by periodic stack tests using EPA-sanctioned measurement methods (here, one initial test and then one repeat test at least once every five years), are unenforceable permit conditions. *Id.* at 36; see Permit §§ D.1.6, D.1.15(c), D.2.1-2, D.4.1-2.

SDI and Amici take a different tack, arguing that petitioners failed to establish that this issue was raised during the public comment period. SDI Resp. at 60; Amicus Br. at 35. SDI also contends that petitioners have not demonstrated clear error in IDEM’s handling of this issue. SDI Resp. at 60. Amici, however, do not echo this latter point. Instead, Amici explain in a footnote that, but for the fact that this issue has not been preserved for appeal, they otherwise

agree with Petitioners that the PM limits do not appear to be enforceable. Nothing in the permit would allow the source or an inspector to assure that emissions are effectively captured by the EAF baghouse. The general condition in C.5 requiring SDI to consistently implement controls would be of no help in determining compliance. Likewise, testing of the EAF baghouse stack, without the establishment of parameters on operation of the LMS and Continuous Caster, are inadequate to demonstrate continuous compliance.

⁶⁰“Redefining the source” is a term of art described in the *NSR Manual*. The *Manual* states that it is legitimate to look at inherently lower-polluting processes in the BACT analysis, but EPA has not generally required a source to change (i.e., redefine) its basic design. For example, substitution of a gas-fired power plant for a planned coal-fired plant would amount to redefining the source.

Amicus Br. at 35 n.21.

We are not persuaded that the issues have been preserved for review. EPA's comment, upon which petitioners rely to raise this challenge, pertains to establishing a single compliance marker for the three units that jointly vent to the EAF baghouse stack. *See* ATSD at 27. Petitioners' arguments on appeal, however, are focused on establishing separate conditions for each of the units that can be enforced if they are violated. A thread of commonality exists between the two concepts, in that LMS/caster/EAF emissions limits are in play in both instances, but the thread is not strong enough to carry the weight of petitioners' new arguments. We must deny review because the issue of separate, independent compliance conditions was not raised during the public comment period and may not be raised for the first time on appeal. *See* 40 C.F.R. § 124.19(a).

b. Heaters/Dryers

To establish that the heater/dryer issue was raised during the public comment period, the Union mentions a Sierra Club comment that questioned how compliance for each of the units would be established. Union Pet'n at 42-43. The Sierra Club asked, "Is there some operational parameter that can be measured on a continuous basis to ensure these units are operating as required?"⁶¹ ATSD at 70. IDEM responded that the projected emissions are very small relative to other NO_x emissions from the proposed mill and thus it was not necessary to require stack tests to demonstrate compliance. *Id.* IDEM also observed that there are no operational parameters that could be measured to demonstrate continuous compliance but that it is in SDI's best economic interest to ensure proper operation of the low-NO_x burners to minimize their consumption of natural gas. *Id.*

⁶¹The Union suggests that several operating parameters, such as fuel flow, firing rate, or furnace temperature, could be monitored. Union Pet'n at 43.

In its response to petitioners on appeal, IDEM repeats these arguments and also claims that it can require stack testing at any time, if it deems such testing necessary. IDEM Resp. at 36. Moreover, IDEM explains that the NO_x limit for each of these nine units “is an expression of the emission factor used in the calculation of each unit’s potential to emit when the low-NO_x burners are in use.” *Id.* SDI agrees with IDEM’s position and contends further that petitioners have not shown abuse of discretion or clear error in IDEM’s treatment of these emissions units. SDI Resp. at 61-62.

Amici agree with petitioners that the 0.1 pound per MMBtu limits are not enforceable as a practical matter because the permit does not include a mechanism for SDI to demonstrate the limits are being met on a continuous basis. Amicus Br. at 35. Amici, however, also contend that petitioners have not adequately shown how IDEM erred or abused its discretion in finding that the use of low-NO_x burners alone adequately demonstrates compliance. *Id.*; *see* Amicus Reply at 23. According to Amici, the relatively small quantities of NO_x emitted by these nine units and “the general understanding that low-NO_x burners should easily achieve the BACT limit for these sources” are reasons to uphold IDEM’s permit decision in this instance.⁶² Amicus Br. at 36.

⁶²In rebuttal, the Union asserts in strong terms that “BACT without compliance conditions turns the entire BACT regulatory program on its head and is clearly erroneous. Limits without compliance demonstration cannot be enforced and are no different than no limits at all.” Union Reply at 34. As to the mandatory use of low-NO_x burners, the Union argues:

The mere use of any control technology does not guarantee compliance with emission limits because the world is not a perfect place. Low-NO_x burners control NO_x by careful mixing of fuel and air to keep flame temperature low and dissipate heat quickly. Low-NO_x burners are not off-the-shelf technology and are individually designed and manufactured for each application on a case-by-case basis. On installation, they must be tuned to achieve the proper

(continued...)

In this case, IDEM made a decision with respect to NO_x emissions from these nine units after considering all public comments thereon. Given the unrebutted general understanding that low-NO_x burners should easily achieve the BACT limit for these sources, we find that petitioners failed to demonstrate clear error or abuse of discretion in IDEM's decision to require low-NO_x burners for the nine units without requiring any specific testing to demonstrate compliance with the 0.1 pound per MMBtu emissions limits. *Cf. In re Encogen Cogeneration Facility*, PSD Appeal Nos. 98-22 to -24, slip op. at 12 (EAB, Mar. 26, 1999), 8 E.A.D. ____ (review denied where petitioners failed to show permit agency's response to comments was inadequate); *In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 16-19 (EAB, Sept. 10, 1998), 8 E.A.D. ____ (same).

⁶²(...continued)

blend of fuel and air. Their performance must always be verified after tuning to assure that vendor-guaranteed emission limits are met. Thereafter, they require periodic maintenance and retuning because their performance degrades with use due to plugging, corrosion and deposit formation. Therefore, performance must be periodically confirmed after initial startup to assure that the burners continue to operate properly. The Permit does not require any compliance demonstration whatsoever, not even an initial source test to confirm vendor guarantees.

Union Reply at 35.

The Union's argument in rebuttal comes too late. Unlike the case of NO_x BACT for the reheat furnace (discussed in Part II.B.3 above), where the bulk of the relevant information was compiled and considered after the close of the public comment period, here we find no reason why petitioners could not have raised this rebuttal argument earlier (i.e., in their petitions in response to IDEM's conclusions on this issue in the ATSD). *See In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 8 n.9 (EAB, Feb. 4, 1999), 8 E.A.D. ____ (“[n]ew issues raised for the first time at the reply stage of these proceedings are equivalent to late-filed appeals and must be denied on the basis of timeliness”).

2. Assurance That BACT Limits Are Met Continuously and at All Levels of Operation (Dual Limits)

Second, petitioners challenge the form of the permit limits selected for the EAF, reheat furnace, and heaters/dryers. Union Pet'n at 45; COW Pet'n at 13. IDEM imposed emissions limits reflecting pollutant mass per unit of time (in pounds per hour) or pollutant mass per unit of process (in pounds per MMBtu), but not both. See Permit §§ D.1.2, D.1.7-.8 (EAF NO_x, SO₂, and CO limits in lbs/hr), D.3.1 (heater/dryer NO_x limits in lbs/MMBtu), D.5.1-.2 (reheat furnace NO_x and CO limits in lbs/MMBtu). Petitioners argue that, by themselves, these types of limits do not assure compliance with BACT at all levels of operation. Union Pet'n at 45-46; COW Pet'n at 13. The Union cites numerous provisions of the *NSR Manual* that suggest pollutants should be regulated under the PSD program using both mass-per-unit-time and mass-per-unit-process limits. Union Pet'n at 45-46 (citing *NSR Manual* at B.56, H.2, H.5, I.2, I.4). One typical provision, entitled "Effective Permit Writing," states:

In general, it is best to express the emission limits in two different ways, with one value serving as an emissions cap (e.g., lbs/hr.) and the other ensuring continuous compliance at any operating capacity (e.g., lbs/MMBtu). The permit writer should keep in mind that the source must comply with both values to demonstrate compliance.

NSR Manual at H.5, *quoted in* Union Pet'n at 46. Accordingly, petitioners contend that the limits cited above for the EAF, reheat furnace, and heaters/dryers fail to comply with EPA guidance and thus constitute error.

IDEM argues that petitioners did not preserve for review their arguments with respect to the reheat furnace and the heaters/dryers. IDEM Resp. at 38. As for the EAF issues, IDEM contends that it considered but rejected dual limits because, for batch steel operations

such as those proposed for SDI's new mill, a production limit in lbs/ton or lbs/MMBtu could be exceeded in the apparently not-uncommon situation where molten steel must be held in the EAF longer than necessary simply for processing. IDEM explains, "Because the proposed SDI facility is designed to make many different structural steel products of varying size and shape, a batch of molten steel may be held in the EAF until the [LMS] and reheat furnace are ready to accept the steel."⁶³ IDEM Reply at 9; *accord* SDI Reply at 18-19. IDEM also points to existing and new provisions in the permit that, it contends, ensure continuous compliance of the type petitioners advocate. One such provision is Section C.5, discussed in Part II.C.1.a above, while other provisions impose stack testing and low-NO_x burner requirements, mandate continuous monitoring of EAF CO emissions, and limit the sulfur

⁶³SDI's explanation of its steelmaking process is as follows:

An EAF melts steel scrap using an electrode arc and low-NO_x/oxyfuel burners. Melted steel can then be tapped into a ladle. After steel chemistry is homogenized to meet product specifications at the [LMS], molten steel is poured into the caster, which makes the various solid product shapes. The shapes are then sent to the reheat furnace or are stored temporarily, depending on production needs and capabilities at that time. The reheated steel is rolled into various final products using product-specific sets of rolls. Unlike most mills, SDI is designed to make over 250 different structural steel products, varying in size and shape. The actual production capacity during a given period of time depends on the product being made. For example, the caster takes longer to cast small structural shapes than bigger ones. This means that sometimes SDI will have to hold molten steel in the EAF until equipment downstream is ready to accept it. Also, because steel-making today is highly equipment-dependent and operates within stringent parameters, there are invariably daily unplanned delays from a few minutes to many hours. Thus, heats are not always the same length and production can vary significantly, subject to the Permit maximums.

SDI Reply at 18-19 n.26.

content of raw materials. IDEM Resp. at 37-38. In IDEM's view, petitioners have failed to identify any clear error on its part regarding these issues. *Id.* at 39; *accord* SDI Resp. at 64.

In their initial brief, Amici focus principally on the three EAF limits. *See* Amicus Br. at 36-40. With respect to the SO₂ limit, Amici contend that a production limit (e.g., in lbs/ton or lbs/MMBtu) is not needed in addition to the hourly limit, contrary to petitioners' arguments. Amici observe that BACT for SO₂ is no control and that compliance with the hourly emissions limit will be demonstrated through annual stack tests and vendor certifications that raw materials fed into the EAF meet specified limits on sulfur content.⁶⁴ *Id.* at 38 (citing Permit §§ D.1.15, D.1.22). Amici conclude that petitioners have failed to establish as clearly erroneous IDEM's treatment of the EAF's SO₂ emissions.

Amici are of a different mind regarding the emissions limits for NO_x and CO. In these instances, Amici argue that IDEM's failure to require dual limits warrants a remand. As support, Amici quote the *NSR Manual* provisions petitioners raise and then rebut each of IDEM's arguments in support of hourly emissions limits alone. For example, Amici argue that Section C.5 of the permit, which requires SDI's consistent implementation of pollution controls and operating practices, is not practically enforceable because its requirements are not easily and objectively measurable. *See* Amicus Br. at 39. Amici also contend that neither the stack testing requirement nor the continuous emissions

⁶⁴Amici explain:

Because controls are not applied to reduce SO₂, production limits [e.g., lb/ton or lb/MMBtu] are not necessary to prevent the source from attempting to meet the hourly limit by reducing production while using a less effective control. Likewise, the raw content limits prevent the source from gaming production levels to allow burning of high sulfur-content raw materials.

Amicus Br. at 38.

monitoring requirement IDEM touts are answers to petitioners' concerns because production still could be manipulated to meet the existing pound-per-hour limits. *Id.* at 40. Amici stress that the purpose of requiring dual limits is to ensure emissions are controlled regardless of the production rate or operational conditions of the facility. *Id.* at 39.

IDEM and SDI respond by pointing out that petitioners and Amici have not provided "any plausible scenario" in which SDI might manipulate its operations in ways those parties fear. IDEM Reply at 10; *see* SDI Reply at 17. They also criticize petitioners' and Amici's use of the *NSR Manual*, claiming that the parties place reliance on portions of the *Manual* that are not relevant to the PSD program. IDEM Reply at 10; SDI Reply at 16, 19. Finally, IDEM contends that Amici are attempting improperly to establish new policy (or even law, as SDI argues) by means of arguments in its briefs. IDEM Reply at 11; *see* SDI Reply at 20.

In our view, petitioners and Amici have supplied several plausible scenarios describing ways in which SDI could potentially conduct its operations to comply with an hourly emissions, but not a production, limit. In comments on the proposed permit, the Union stated:

Because permit limits are expressed in terms of pounds per hour, rather than pounds per ton, the more usual metric, a 1-hr source test could be conducted over a low-emitting heat. Alternatively, the source test could be conducted over a long time period, averaging out routine spikes and excursions. Both situations would bias the results, making it appear that the EAF is in compliance when it is not.

Union/Fox Cmts at 31, *quoted in* ATSD at 28. In their reply brief, Amici further explain:

IDEM first determined that BACT for NO_x emissions from the EAF was the 'use of low-NO_x burners with a

limit of 0.35 lbs/ton.’ This BACT limit was multiplied by the production rate limit of 200 tons per hour to derive the emission rate of 70 pounds per hour. * * * [However], if the production rate were to fall to 100 pounds per hour, the hourly equivalent to the 0.35 lb/ton BACT limit would be 35 pounds per hour. If the production rate slows, the ‘finely tuned’ operational practices [which SDI will have 540 days to develop under the permit] may no longer be necessary to meet the 70 pound per hour limit. If the source continues to emit at 70 pounds per hour despite the lowered production rate, it is clear that the source is no longer meeting BACT. Yet the permit would not deem such operations to constitute a violation, assuming they could be detected in the first place.⁶⁵

Amicus Reply at 30 (citations omitted).

In addition, the Union notes that in the TSD, IDEM listed EAF permit limits for CO at fourteen other steel mills and for NO_x at fifteen

⁶⁵Amici further observe that:

IDEM has noted on several occasions that the CO emissions are related to the carbon content of the materials charged into the EAF and that the carbon content of the charged material is driven by the particular steel product being made. In certain situations when using particularly high carbon-containing charge materials, it might be easier for the source to meet a pounds per hour limit by slowing production rates than by improving the efficiency of the control devices.

Amicus Reply at 33 (citation omitted).

other steel mills.⁶⁶ See TSD app. B at 4-5, 10-11. The Union observes, correctly, that “[e]very single one of these other permits established emission limits for CO and NO_x from the EAF as either lb/ton and lb/hr or lb/ton alone. The majority of the permits (62%) correctly established both lb/ton and lb/hr limits.” Union Reply at 37. The Union argues that these data -- IDEM’s own -- prove the opposite of IDEM’s position that continuous limits in lbs/ton are not appropriate for batch steelmaking processes such as EAFs. *Id.* The Union also argues that if there is truth in IDEM’s contention that production limits will be exceeded because of potential false emissions increases caused by nonstandard molten-steel holding times in the EAF, then IDEM failed to establish BACT for SDI’s EAF. *Id.* at 38. This is because IDEM based the BACT limits for the EAF on lbs/ton limits achieved in practice at other facilities, and then simply converted the lbs/ton figures to lbs/hour figures when SDI commented that it could not meet lbs/ton limits. *Id.*

IDEM does not dispute that, under the PSD program, BACT limits must be established to ensure compliance on a continuous basis at all levels of operation. Indeed, IDEM states in the ATSD that it “agrees with the concern that BACT limitations must be established to ensure compliance on a continual basis at all [levels] of operation. [IDEM] understands that the permit must prevent situations where control devices may be used less efficiently than intended because production has decreased.” ATSD at 28; *see also* CAA § 302(k), 42 U.S.C. § 7602(k) (emissions limits (such as BACT) are designed to restrict air pollutant emissions “on a continuous basis”); *cf. In re Genesee Power Station*, 4 E.A.D. 832, 856-57 (EAB 1993) (“because it contains neither numerical limits on the lead content of wood being burned at the facility nor work

⁶⁶These mills produce a variety of products, including coiled strip, coiled plate, and discrete plate at IPSCO Steel in Iowa; thin slabs and structural coils at Trico Steel in Alabama; blooms and beams at NUCOR-Yamato Steel in Arkansas; structural steel at Roanoke Electric Steel Company in Virginia; and round bars at Mac Steel in Arkansas. TSD app. B at 4-5, 10-11.

practice standards, the permit does not provide a means of determining compliance with the fuel cleaning requirements”).

Moreover, of fifteen other EAFs at steel mills across the country (which presumably are similar enough to SDI’s proposed mill to warrant their use in establishing BACT limits for SDI), none have CO or NO_x emissions limits in pounds per hour only. *See* TSD app. B at 4-5, 10-11. As the Union points out, the majority of these mills have lbs/hr *and* lbs/ton limits for these pollutants, and the minority have lbs/ton limits only.

These facts are compelling. IDEM clearly drew its BACT limits for SDI from the experiences of these other mills, but we have found no adequate explanation in the record explaining why the forms of the limits deviate from those of the other mills. It may be that SDI’s proposed mill is dramatically different, in relevant respects, from the fifteen comparative mills, but if that is so, that fact must be clearly documented in the record to a greater degree than heretofore. *See In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 15 (EAB, Feb. 4, 1999), 8 E.A.D. ___ (“The BACT analysis is one of the most critical elements of the PSD permitting process. As such, it should be well documented in the administrative record.”); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 431 (EAB 1997) (interested parties must be given full notice of the basis for final permit decisions); *In re Austin Powder Co.*, 6 E.A.D. 713, 718-20 (EAB 1997) (administrative record must reflect “considered judgment” necessary to support permit issuer’s decisions); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 453-54 (EAB 1992) (same); *cf. NSR Manual* at B.19 (when comparing sources for technical feasibility purposes, applicant must describe unusual circumstances or significant differences between its facility and others to establish infeasibility).

We conclude that the BACT limitations for NO_x and CO emissions from the EAF must be remanded to IDEM for reconsideration. We find that IDEM clearly erred in choosing, without adequate explanation, CO and NO_x limits of a type completely different from those of the fifteen representative steel mills used to determine BACT limits in

this case. IDEM is ordered to explain why the limits it imposed are in lbs/hr (rather than in lbs/hr *and* lbs/ton, or lbs/ton alone), in particular explaining in detail the specific differences (if any) between SDI's proposed mill and the fifteen polled mills that would justify exclusive lbs/hr limits for CO and NO_x. Even if IDEM is able to make such a demonstration, it must incorporate other provisions in the permit that would fully address and protect against the types of permit abuses described above by the Union and Amici. Alternatively, IDEM is ordered to impose production limits in addition to the hourly limits for these pollutants.

As for the other pending issues here, we agree with IDEM that petitioners have not preserved the reheat furnace and heater/dryer compliance issues for review. We can find no reference to these issues in the comments on the proposed permit, and none have been pointed out to us. Thus, review of these issues is denied. *See* 40 C.F.R. §§ 124.13, .19(a). Review of the permit conditions pertaining to SO₂ emissions from the EAF is also denied. The sulfur-related conditions in the permit (i.e., vendor certifications, stack tests) and the fact that BACT for SO₂ is no control alleviate any concerns about SO₂ emissions exceeding the BACT limit at any given rate of production. *See supra* note 64 and accompanying text.

3. *Raw Material Sulfur Limits*

Third, in its comments on the proposed permit, the Union explained that “[s]teel is made by adding direct reduced iron (“DRI”) and carbon to scrap steel.” Union/Fox Cmts at 33. Here, petitioners challenge the sulfur-content limit IDEM selected for DRI (0.2% sulfur), claiming the limit is so high as to allow the EAF emissions ceiling for SO₂ (50 lbs/hr) to be continually exceeded. Union Pet’n at 47; COW Pet’n at 14; *see* Permit §§ D.1.7, D.1.22(a). According to the Union, a DRI sulfur limit of 0.2% corresponds to 88 lbs/hr of SO₂ emissions, or 38 lbs/hr in excess of the 50 lbs/hr SO₂ limit. Union Pet’n at 47-48; Union/Fox Cmts at 33. The Union also points out that scrap steel is responsible for 37% of the sulfur introduced into the EAF, and yet IDEM

did not add any permit condition to limit the sulfur content of scrap. Union Pet'n at 48. Finally, the Union complains that IDEM replaced (in response to SDI comments) a raw material monitoring requirement with a condition requiring only that SDI obtain vendor verification of the sulfur content of raw materials. *Id.* Petitioners argue that these conditions are not enforceable and should be remanded.

In its response to comments, IDEM stated that it did not believe it was "feasible to require a lower sulfur content in the DRI" than that proposed in SDI's permit. ATSD at 15. IDEM elaborated on this assertion by reciting and distinguishing examples from two steel mills that have SO₂ limits lower than 0.2 lbs/ton (Roanoke Electric Steel in Virginia, at 0.168 lbs/ton, and Nucor-Yamato Steel in Arkansas, at 0.15 lbs/ton). *Id.* at 16-17. IDEM also distinguished the circumstances of eight other facilities with low SO₂ limits and provided further detailed information in response to comments. *Id.* at 17-18. For instance, IDEM addressed the scrap issue, explaining that a scrap management plan, such as the one required in SDI's permit, is the only means it is aware of to assure low sulfur content in scrap. *Id.* at 15. IDEM also addressed the issue of raw material monitoring versus vendor certification. After laying out SDI's reasons for requesting the change, IDEM acted to allay concerns about fluctuations in SO₂ emissions by changing the once-every-five-year stack test requirement to an annual stack test requirement, and by requiring SDI to submit data showing the sulfur content of raw materials used during each stack test as compared to the sulfur content of raw materials used over the past year of operation. *Id.* at 24, 84.

On appeal, petitioners repeat the charges they made during the comment period, but they have not supplied any information or argument to rebut the explanations provided in IDEM's detailed response to comments. *See* Union Pet'n at 47-48; COW Pet'n at 14. We have repeatedly held that where petitions merely restate previously submitted comments without indicating why the permit agency's responses thereto were clearly erroneous or otherwise warranted review, review will be denied. *See, e.g., In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 19 (EAB, Sept. 10, 1998), 8 E.A.D. ___; *In re SEI Birchwood, Inc.*,

5 E.A.D. 25, 27 (EAB 1994). Because the circumstances surrounding these sulfur issues fall into this category, review of the issues must be denied.

4. *Continuous Emissions Monitoring for SO₂ and NO_x*

Fourth, petitioners challenge IDEM's decision not to require continuous emissions monitors ("CEMs") for SO₂ and NO_x emissions from the EAF and for NO_x emissions from the reheat furnace. Petitioners argue that without CEMs, the emissions limits IDEM established as BACT for these pollutants -- i.e., SO₂ # 50 lbs/hr and NO_x # 70 lbs/hr from the EAF, and NO_x # 0.11 lbs/MMBtu from the reheat furnace -- cannot be enforced. Union Pet'n at 48; COW Pet'n at 14; *see* Permit §§ D.1.2, D.1.7, D.5.1. Petitioners contend, on the basis of guidance in the *NSR Manual*,⁶⁷ that CEMs must be required unless they are demonstrated to be infeasible. Union Reply at 41; COW Pet'n at 14. Amici agree with petitioners' contention and assert that IDEM clearly

⁶⁷As discussed below, petitioners' reference to the *NSR Manual* appears for the first time in their petitions; the comments on which the petitioners predicate their challenge here did not include such a reference.

erred by rejecting CEMs without finding them infeasible.⁶⁸ Amicus Br. at 42.

IDEM argues that CEMs are generally required only in cases where (1) an add-on pollution control device is used; (2) there is a limited amount of information available to document compliance; and (3) emissions could adversely affect air quality if not accurately monitored. IDEM Resp. at 41; ATSD at 50. IDEM takes the position that none of these factors is in play here, so CEMs are not needed. IDEM and SDI also argue that because there is no legally binding PSD requirement that CEMs be employed for NO_x and SO₂ emissions from steel mills, IDEM did not err in choosing not to mandate their use as part

⁶⁸As support for their position, petitioners and Amici rely on the following EPA guidance:

The construction permit should state how compliance with each [BACT] limitation will be determined[.] * * * These permit compliance conditions must be very clear and enforceable as a practical matter[.] * * * Where continuous, quantitative measurements are infeasible, surrogate parameters must be expressed in the permit.

NSR Manual at H.6, *quoted in part in* Amicus Br. at 42.

Continual and continuous emissions performance monitoring and recordkeeping (direct and/or surrogate) should be specified where feasible.

Id. at H.10, tbl. H.2, *quoted in* Union Pet'n at 49.

Emissions limits should reflect operation of the control equipment, be short term, and, where feasible, the permit should require a continuous emissions monitor.

Id. app. C at c.4, *quoted in part in* Union Pet'n at 49. Notably, as discussed below, Region V's comments to IDEM on this issue did not reference the *NSR Manual*.

of SDI's construction permit. IDEM Resp. at 41; SDI Resp. at 67-68; SDI Reply at 22. IDEM and SDI accordingly charge that petitioners and Amici are improperly attempting to extract legal requirements from the *NSR Manual*, which is interpretive guidance only and not law.⁶⁹ See IDEM Reply at 12-13; SDI Resp. at 67-68; SDI Reply at 22-23.

IDEM and SDI argue further that SDI's permit does not lack enforcement provisions for these pollutants. As IDEM explained in its response to comments and as SDI reiterates in part on appeal, the permit contains process control, operating practice, and testing requirements for NO_x and SO₂ emissions from the EAF and reheat furnace. See ATSD at 50-51; SDI Resp. at 67-68. These requirements include: (1) annual stack tests for EAF emissions; (2) a stack test at least once every five years for reheat furnace emissions; (3) certifications from vendors of all materials fed into the EAF (except scrap steel) that the sulfur content of those materials is beneath a prescribed limit; and (4) use of ultra-low-NO_x burners on the reheat furnace and of low-NO_x/oxyfuel burners as the EAF auxiliary burners. Permit §§ D.1.15(a)-(b), D.1.22, D.5.1, D.5.3. In addition, the permit gives SDI a 540-day period in which to experiment with EAF operating practices that affect NO_x generation (e.g., controlling oxygen levels, temperature variations, slag formation,

⁶⁹In related fashion, IDEM argues in its reply brief that:

Amici now, and without previous warning to the state permitting agency (in this case IDEM), seem to suggest that the NSR Manual *requires* the use of CEMs on facilities that have no add-on control devices * * *. Amici not only seek to have the [Board] establish a new policy on their behalf, but ask the [Board] to read more into the NSR Manual language than is there. * * * Amici take a position that would result in requiring CEMs for *all* emission units for *all* future proposed major sources because it is unlikely that the source or permitting authority could ever demonstrate the "infeasibility" of installing CEMs.

IDEM Reply at 12-13 (footnote omitted).

and other factors) so that it can achieve its NO_x BACT limit of 70 lbs/hr. Permit § D.1.15(a)(2); *see* ATSD at 21. These requirements, IDEM and SDI suggest, are legitimate surrogates to CEMs, even by the lights of the *NSR Manual*. *See* IDEM Resp. at 40-41; SDI Resp. at 66-68. Thus, they argue, petitioners' and Amici's arguments on this ground are baseless.

As one final argument, SDI posits that these issues have not been preserved for review. SDI Resp. at 66-67. SDI points to each of the two comments on which petitioners base their appeal.⁷⁰ The first comment, submitted by EPA, stated:

A NO_x CEM will develop more detailed information regarding impact of these new emissions with the ambient Ozone levels. The USEPA would like to discuss the potential benefits of this device for possible NO_x trading opportunities.

ATSD at 29. IDEM responded to this comment by remarking that it believed "more frequent stack testing [(i.e., annual as opposed to once per five years)] would provide adequate information for PSD compliance as well as information for possible NO_x trading opportunities." *Id.* The second comment, submitted by "several concerned citizens," stated:

The applicant is required to install [CEMs] for only CO and VOC emissions. The applicant should be required to provide continuous monitoring for any pollutant where feasible, including opacity, SO₂, NO_x, PM₁₀, and lead. In addition, the monitoring should be required to be performed by an outside agent for the life of the plant

⁷⁰COW also cites comments that address compliance monitoring for SO₂. *See* COW Pet'n at 14. While those comments discuss recordkeeping, vendor analysis, and other proposed requirements, we can find no mention of CEMs therein. *See* ATSD at 23-24.

with language that specifically forbids the applicant from petitioning in the future to have the monitors removed. Also, the results should be publicly disclosed.

Id. at 50. IDEM responded at length to this comment, explaining many of the factors discussed above about its perceived lack of need for SO₂ and NO_x CEMs and its imposition on SDI of alternative compliance conditions. *See id.* at 50-51. On appeal, SDI argues the issues raised in the petitions and the Amicus Brief are not on all fours with these comments and may not be reviewed for the first time by the Board. SDI Resp. at 66-67.

On balance, we agree that the CEMs issue, as framed in the petitions and in Amici's briefs, was not adequately preserved for review. The linchpin of petitioners' and Amici's arguments is the language in the *NSR Manual* calling for CEMs if feasible, with each maintaining that IDEM is required to engage in CEMs feasibility analysis or be remanded on clearly erroneous grounds. This reference to the *NSR Manual* as an authority requiring CEMs feasibility analysis is nowhere presented in the comments on the proposed permit, and IDEM therefore had no opportunity to grapple with it during its permit decisionmaking process.⁷¹ As we have observed in the past, the purpose of rules requiring parties to have properly preserved issues for appeal is

to ensure that the permitting authority * * * has the first opportunity to address any objections to the permit, and that the permit process will have some finality. *See [In re] Encogen [Cogeneration Facility]*, PSD Appeal Nos. 98-22 to -24, slip op. at 8 [(EAB, Mar. 26, 1999)], 8 E.A.D. ___ (“The effective, efficient, and predictable

⁷¹Instead, IDEM appears to have construed the comment advocating the use of CEMs where “feasible” in the general sense of that word (i.e., as “possible,” “capable of being done”), and not in the sense that is urged on appeal (i.e., that feasibility is the legal linchpin to CEM's mandatory use).

administration of the permitting process demands that the permit issuer be given the opportunity to address potential problems with draft permits before they become final.”). “In this manner, the permit issuer can make timely and appropriate adjustments to the permit determination, or, if no adjustments are made, the permit issuer can include an explanation of why none are necessary.” *In re Essex County (N.J.) Resource Recovery Facility*, 5 E.A.D. 218, 224 (EAB 1994) (quoting *In re Union County Resource Recovery Facility*, 3 E.A.D. 455, 456 (Adm’r 1990)).

In re Sutter Power Plant, PSD Appeal Nos. 99-6 & 99-73, slip op. at 9-10 (EAB, Dec. 2, 1999), 8 E.A.D. _____. Moreover,

[w]hile it is appropriate to hold permitting authorities accountable for a full and meaningful response to concerns fairly raised in public comments, such authorities are not expected to be prescient in their understanding of * * * imprecise comments * * *. “At a minimum, commenters must present issues with sufficient specificity to apprise the permit issuing authority of the issues being raised. Absent such specificity, the permit issuer cannot meaningfully respond to comments.”

Sutter, slip op. at 19 (quoting *In re RockGen Energy Center*, PSD Appeal No. 99-1, slip op. at 17 (EAB, Aug. 25, 1999), 8 E.A.D. ____).

In our decisions, we have often emphasized that “all reasonably available arguments” supporting a position must be raised by the close of the public comment period. 40 C.F.R. § 124.13. Moreover, petitioners must demonstrate “that the issue to be reviewed on appeal was specifically raised during the public comment period.” *In re Maui Elec. Co.*, PSD Appeal No. 98-2, slip op. at 11 (EAB, Sept. 10, 1998), 8 E.A.D. _____. On this basis, we have often denied review of specific

issues that were raised in a general manner during the public comment period. See *In re Florida Pulp & Paper Assoc.*, 6 E.A.D. 49, 54-55 (EAB 1995) (comment regarding sludge testing being unnecessary is not sufficient to preserve for appeal the question of legal authority to require any sludge testing); *In re Pollution Control Indus. of Ind., Inc.*, 4 E.A.D. 162, 166-69 (EAB 1992) (comments on two aspects of testing requirement in permit are not sufficient to raise, on appeal, general objection to any testing requirement); see also *Maui*, slip op. at 10-15, 8 E.A.D. ____ (comments raising general issue of whether particular fuel is available from fuel suppliers not sufficient to preserve objection raised on appeal that permit issuer had found this fuel to be available in recent permit decision).

In this case, the comments on this issue did not reference the *NSR Manual*, which effectively deprived IDEM of the opportunity to respond to the particular issue now before us. Not surprisingly then, there is no discussion in the response-to-comments document of the *NSR Manual*'s "legal requirements" for a CEMs feasibility analysis. Accordingly, we will not reach the merits of an issue IDEM was not presented with during the public comment period with sufficient clarity to enable a meaningful response. See, e.g., *In re Encogen Cogeneration Facility*, PSD Appeal Nos. 98-22 to -24, slip op. at 10 n.12 (EAB, Mar. 26, 1999), 8 E.A.D. ____ (where "an issue is raised only generically during the public comment period, the permit issuer is not required to provide more than a generic justification for its decision, and the petitioners cannot raise more specific concerns for the first time on appeal"); *In re Knauf Fiber Glass, GmbH*, PSD Appeal Nos. 98-3 to -20, slip op. at 35 (EAB, Feb. 4, 1999), 8 E.A.D. ____ (issues raised in general manner warrant general justifications from permit issuer).⁷²

⁷²In their reply brief, in addition to their concerns about the lack of a feasibility analysis for CEMs and their concerns about dual limits, Amici forcefully argue the issue of practical enforceability as it pertains to the limitations on NO_x emissions from the EAF and reheat furnace. See, e.g., Amicus Reply at 24-26, 28-30. Amici are complaining
(continued...)

5. *Slag Production and Emissions Limits*

Fifth, petitioners contend that IDEM erred by not including in SDI's permit daily slag production limits, daily slag recordkeeping requirements, continuous fence-line opacity monitoring, limitations on the slag area's potential to emit PM, and a condition requiring the submittal and public review of design specifications for the slag processing enclosure. Union Pet'n at 52-56; COW Pet'n at 14.

IDEM responds by pointing out that the opacity monitoring and potential-to-emit issues were not raised during the public comment period and thus were not properly preserved for review by this Board. IDEM Resp. at 43-45. The Union cites an EPA e-mail to the IDEM permit writer sent during the comment period as the record source for the opacity issue, but EPA did not later incorporate that issue into its formal comments on the draft permit. See COW Pet'n ex. 2 (EPA Cmts). Thus, IDEM argues, the issue may not be raised here for the first time.⁷³ *Id.* at 43-44; accord SDI Resp. at 69. With respect to the purportedly deficient slag production and recordkeeping requirements, IDEM explains that neither the annual production limit it placed in the final permit (i.e., 262,800 tpy) nor even petitioners' proposed daily limit is necessary to

⁷²(...continued)

here not about the form of the limits but about whether compliance with the limits can be demonstrated at any time (e.g., whether a five-year stack test for the reheat furnace is sufficient to verify compliance). We cannot find this complaint in the comments on the draft permit, however, see ATSD at 23-24, 27-30, 46, 50-51, 58-59, 69-70, and if it exists, the parties have not brought it to our attention. Thus, although we generally agree that permit emissions limits must be enforceable, see CAA § 302(k), 42 U.S.C. § 7602(k); *In re Genesee Power Station*, 4 E.A.D. 832, 856-58 (EAB 1993), we cannot reach the merits of the specific concerns now raised on appeal. See *Encogen*, slip op. at 10 n.12, 8 E.A.D. ___; *Knauf*, slip op. at 35, 8 E.A.D. ___.

⁷³IDEM suggests the issue was subsequently discussed with Region V by telephone and thereafter not pursued by the Region in its final comments or otherwise. IDEM Resp. at 43-44.

enforce BACT, which consists of the use of skull slag, water suppression, minimal drop heights, and visible emissions limits for various points in the slag processing operations. IDEM Resp. at 42-43; *see* TSD app. B at 27-28. Moreover, IDEM points out that it included a recordkeeping requirement in the permit that will ensure SDI's compliance with the annual production limit, and IDEM may inspect the supporting documentation if need be. IDEM Resp. at 43. Finally, IDEM notes that it did not include specific design parameters for the slag enclosure because this is not the type of complicated structure that would require conditional design plans. *Id.* at 45.

The Union insists that the opacity issue is preserved for review, citing *In re Masonite Corp.*, 5 E.A.D. 551 (EAB 1994), to support its position. In that case, the Board ruled that an issue raised by a citizen group in a meeting with EPA held during the public comment period was properly preserved for review. *Masonite*, 5 E.A.D. at 560. The Union notes that the permit regulations require only that issues be raised during the comment period, not that they be submitted as part of formal comments. Union Reply at 42 (citing 40 C.F.R. § 124.13).

We do not believe this case, involving a distinction between formal and informal comments submitted by EPA, is controlled by *Masonite*, but in any event find it unnecessary to decide the issue. On appeal, petitioners have not met their burden of demonstrating clear error or abuse of discretion in IDEM's treatment of this opacity issue. Petitioners argue only that the six-minute opacity average "is clearly inadequate to enforce the BACT determination," Union Pet'n at 54, presumably (for they do not say so expressly) for the reasons expressed in Region V's original e-mail. That e-mail stated:

[Region V] feel[s] that a 6-minute average is a very large averaging time. This process is instantaneous, in other words, one second there might be a large plume of smoke at 60% opacity, while at the next second, there is 0% opacity. If you average these opacities out, you don't get a valid characterization of the emissions during

that whole 6-minute period. We would like to discuss a shorter averaging time.

Union Pet'n ex. 6-7 (Electronic Mail from Kushal Som, EPA Region V, to IDEM (Apr. 6, 1999)).

This is simply not enough to justify sending the opacity issues back to IDEM. To demonstrate clear error or abuse of discretion on IDEM's part in this instance, petitioners would have had to supply us with sufficient evidence that a six-minute average is out of the ordinary as compared to other similarly situated steel mills, and/or that, for specific reasons, a lower particular average (e.g., three-minute, four-minute, or only continuous monitoring) would validly characterize emissions and be practicable for this facility. We have no supportable reason, on this record, to question IDEM's technical judgment in this regard, and as a result, review of this issue is denied. Review of the potential-to-emit issue is also denied, in that instance because it was not raised during the public comment period and thus was not preserved for review on appeal.

We agree, moreover, that petitioners have failed to identify clear error or abuse of discretion on IDEM's part with respect to the other three slag-handling matters (i.e., daily slag production limits, daily slag recordkeeping, and public review of design specifications for the roofed enclosure). IDEM provided reasoned responses to the slag-related issues raised during the public comment period, and it provided reasonable explanations on appeal of new slag-related conditions added to the final permit. *See* ATSD at 12-13; Permit att. A (Fugitive Dust Control Plan); IDEM Resp. at 42-45. We therefore deny review on these grounds.

6. *Transportation Fugitive Dust Conditions*

Sixth, petitioners challenge IDEM's selection of compliance conditions for fugitive dust emissions from vehicles traveling on paved and unpaved road surfaces at the proposed facility. IDEM notes that, in addition to establishing visible emissions limits for transportation activities,

it included a Fugitive Dust Control Plan (“FDCP”) as part of SDI’s permit. That plan mandates regularly scheduled maintenance of paved surfaces by use of vehicular vacuum sweepers, wet sweepers, or water flushing; the keeping of a daily journal of the frequency and amount of vacuum sweeping, dust suppressant, and spill control activities SDI performs; and direct measurement of opacity and surface silt loadings upon request. IDEM Resp. at 45-46; *see* Permit att. A at 1-4 (FDCP). SDI adds that the FDCP also provides for unscheduled inspections by IDEM personnel to ensure the visible emissions limits are not exceeded. SDI Resp. at 72; *see* Permit § D.8.1 (setting forth visible emissions limits for paved and unpaved surfaces at proposed mill); ATSD at 55, 70 (visible emissions testing will be conducted during unannounced visits to the source).

In response to comments on these issues, IDEM explained that it had decided monitoring and recordkeeping provisions other than those it had already included in the FDCP would not be needed to ensure SDI’s compliance with its visible emissions limits. ATSD at 71. The Union contends this decision is erroneous because EPA guidance purportedly *requires* continuous, quantitative emissions monitoring and recordkeeping where feasible, and here IDEM made no effort to establish that such conditions were infeasible. Union Pet’n at 57 (citing *NSR Manual* at H.6 & tbls. H-2, I-1).

Here, Amici disagree with the Union view, finding IDEM’s conclusion appropriate. Amici state:

[R]egular monitoring of compliance activities under the [FDCP] adequately ensures compliance with the BACT limit for transportation-related emissions. The [NSR] Manual expresses a preference for continuous, direct monitoring but also recommends surrogate parameter monitoring “where direct monitoring is impractical or in conjunction with tested data.” [NSR] Manual at H.6, I.7. IDEM has adopted a compliance approach that includes parametric monitoring with periodic direct

measurement of opacity. IDEM's approach appears consistent with the approach recommended in the [NSR] Manual. Petitioners do not suggest that there is a continuous monitoring option available, but instead assert that direct measurement should be more frequent and used in place of the parametric monitoring. This approach is not clearly required by the [NSR] Manual, and Petitioners have not demonstrated why a "non-continuous" direct measure, on its own, would better ensure compliance with the BACT limit.

Amicus Br. at 44.

We agree that petitioners have failed to demonstrate that their monitoring proposal is preferable to that selected by IDEM or that IDEM clearly erred or abused its discretion in its treatment of compliance conditions for fugitive transportation emissions. The FDCP, with its requirements for daily journal entries and biweekly street cleanings, along with other provisions for direct opacity measurements upon request and unscheduled inspections, seems to us adequate to assure compliance with visible emissions limits. Thus, review of these issues is denied.

7. Permit Limits for EAF Emissions of NO_x, SO₂, and PM

Seventh, petitioners argue that IDEM failed to provide sufficient specificity in delineating the stack testing requirements for SDI's NO_x, SO₂, and PM emissions from the EAF, and thus the BACT limits for these pollutants are unenforceable. Union Pet'n at 57-59; *see* COW Pet'n at 14. In particular, the Union contends that IDEM did not consider or specify averaging times for the pollutants, did not require specific stack test methods for NO_x or SO₂, and did not specify the conditions under which the source tests would be performed for any of the three pollutants. Union Pet'n at 58-59.

IDEM had explained in the response-to-comments document that SDI would be required to prepare a stack testing protocol that ensures

tests are run during normal operating periods and are at least one hour in duration. IDEM explained further that if it were to deem the protocol, once it is developed, to be deficient in any way, it would require SDI to amend the protocol. ATSD at 29; *see* IDEM Resp. at 47. On appeal, the Union expresses concern about this decision by stating, among other things:

[T]he PSD Permit does not establish the conditions required to determine compliance, but rather leaves the establishment of such provisions to the future discretion of IDEM in approving a source test protocol. * * * There is no assurance that the establishment of a “protocol” [in accordance with State of Indiana regulations] would be subject to the public notice and review requirements of 40 C.F.R. § 52.21 & Part 124. Therefore, relying on a future source test protocol is clearly erroneous as it allows for specification of the terms of the PSD permit outside of the PSD permitting process.

Union Pet’n at 59.

Petitioners’ concern that the test protocol provision may evade the public notice and comment requirements of the federal PSD regulations was not mentioned in the comments on the draft permit, despite the presence of a clear provision in section C.7 of that permit specifying that a test protocol should be submitted to IDEM no later than thirty-five days prior to the scheduled test date. *See* Draft Permit § C.7. A concern about public review of protocols submitted pursuant to this provision was reasonably ascertainable during the public comment period, and therefore it should have been raised then. *See* 40 C.F.R. § 124.13 (commenters “must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period”). Because it was not, it will not be considered on appeal. *Id.* § 124.19(a).

Moreover, IDEM notes in response to the petitions that the issues regarding specific stack test methods and source test conditions were not raised in the comments and thus were not preserved for review. IDEM Resp. at 46-47. We agree that this is the case. The Union's comments on this subject were focused on averaging times and sampling durations, not on specific test methods or conditions under which stack tests would be conducted. See Union/Fox Cmts at 31 (in section titled "No Averaging Times Specified for EAF Emission Limits," stating, "The Permit as currently drafted does not specify any averaging times for the emission limits proposed for the EAF for NO_x, SO₂, and PM₁₀. The permit also does not specify any sampling durations for the source tests required in the compliance demonstration sections for these three pollutants."); see ATSD at 28 (quoting same). The Union contended in its comments that the variability of EAF emissions rates made it essential that averaging times be used "to assure that the full range of variability in emissions is captured during the source test." Union/Fox Cmts at 31. The Union cannot now parley this specific concern into broader remarks about test methods and test conditions, and, thus, review of these matters is denied. See, e.g., *In re Florida Pulp & Paper Assoc.*, 6 E.A.D. 49, 54-55 (EAB 1995) (comment regarding one aspect of sludge testing required by permit is not sufficient to preserve for appeal the general question of authority to require any sludge testing); *In re Pollution Control Indus. of Ind., Inc.*, 4 E.A.D. 162, 166-69 (EAB 1992) (comments on two aspects of testing requirement in permit are not sufficient to raise, on appeal, general objection to any testing requirement).

This leaves the question of whether IDEM's failure to include in the permit specific averaging times or sampling durations constituted clear error or an abuse of discretion. In its response to comments on these issues, IDEM stated:

The Department's stack testing rules, under 326 IAC 3-6, provide that the source must prepare a protocol [that] will allow testing of emissions during normal operating periods. In any case, this period cannot be less [than]

one hour for each stack test run. Historically, steel mills have used tap to tap testing runs, which can last up to ninety minutes.

ATSD at 29. Petitioners offer no evidence that stack test durations of at least one hour or tap-to-tap runs of ninety minutes are inadequate to obtain reasonable assessments of facility performance. Instead, they argue only that the “conditions” of source tests should be specified in the permit because “high variability of emissions has been alleged” due to the diversity of products to be manufactured by this mill. Union Pet’n at 58. This is not a sufficient showing of clear error or abuse of discretion to warrant a grant of review. Accordingly, review of these issues is denied.

8. Lead Permit Limits

Eighth, petitioners contend that the permit limit IDEM placed on EAF lead emissions, 0.134 pounds per hour, is not enforceable. Union Pet’n at 59-60; COW Pet’n at 14. IDEM added this limit to the final permit in response to comments, and the Union believes the limit is unenforceable because the permit does not specify a stack test method, test frequency or conditions, averaging time, or detection limit. Union Pet’n at 59-60; *see* Permit § D.1.15(d) (establishing speciation tests for HAPs emissions from EAF). The Union also objects, as it did in the foregoing section, to the provision allowing SDI to develop a testing protocol and submit it to IDEM prior to the stack test. The Union argues that such establishment of a testing protocol would circumvent public notice and comment requirements of the federal PSD program. Union Pet’n at 60.

Amici take the position (as they did in Part II.A above) that the hourly emissions limit for lead is not needed to ensure that the proposed mill remains below the significance level for lead. Amicus Br. at 45. Accordingly, Amici contend that review of the limit’s enforceability should be denied. *Id.*

For the reasons expressed in Part II.A above, we have remanded the lead BACT determination to IDEM. The materiality of the enforceability of a lead limit in this permit is entirely dependent on IDEM's conclusion on whether the proposed mill's potential to emit lead is below the PSD significance level for lead. We cannot predict at this point the outcome of IDEM's deliberations in this regard. Because the lead BACT determination has been remanded and the enforceability issues argued here may as a result of that remand become moot, we decline to review these issues.

9. Preventative Maintenance Plan Requirements

Ninth, petitioners contend that the EAF Preventive Maintenance Plan ("PMP") required by sections B.8 and D.1.14 of the permit is essential to ensure SDI complies with its BACT limits for that emissions unit. Union Pet'n at 60-61; COW Pet'n at 14; *see* Union/Fox Cmts at 34; ATSD at 30. Because IDEM has chosen to allow SDI to develop the PMP after the permit is issued, petitioners argue that the opportunity for public review and comment on this important element of SDI's permit has been erroneously foreclosed. Union Pet'n at 61; COW Pet'n at 14.

IDEM argues that it responded to all comments on this issue, explaining that the portions of the PMP critical to ensuring continuous compliance are already incorporated in the permit and that the PMP will contain maintenance procedures based on vendor specifications and suggestions that may not yet be available to SDI. IDEM Resp. at 48-49 (citing ATSD at 30-31). IDEM also claims that the PMP is not a PSD requirement but rather a Title V operating permit program requirement. *Id.* at 49; *accord* SDI Resp. at 75-76. Thus, IDEM argues that review should be denied.

In our view, petitioners have failed to carry their burden of demonstrating clear error or abuse of discretion on IDEM's part with respect to this issue. In response to the comments, IDEM added a new condition that SDI keep at least 100 fresh bags on hand to ensure timely replacement of any failed bags in the EAF baghouse. ATSD at 30; *see*

Permit § D.1.21. IDEM also explained that it did not “believe it [to be] possible or necessary to circulate the PMP for public review before the permit is finalized” because the PMP will contain “many maintenance procedures that are based on vendor specifications and suggested maintenance that may not be available to the company at this time.” ATSD at 30-31. Petitioners do not provide any evidence or argument to contradict this assertion, which appears on its face to be reasonable. Petitioners also provide no reply to IDEM’s and SDI’s claim that the PMP is a Title V, and not a PSD, requirement. Thus, review of this issue is denied.

D. *Miscellaneous Issues*

We deal finally with several miscellaneous issues raised by petitioners, including challenges to IDEM’s soil and vegetation analysis, to the adequacy of the public review and comment procedures, and to a number of other issues.

1. *Soil and Vegetation Analysis*

Petitioners challenge the soil and vegetation impact analysis conducted, pursuant to 40 C.F.R. § 52.21(o), in support of the permit in this case.⁷⁴ They criticize IDEM for purportedly failing to document and explain the analysis adequately, including neglecting to identify the model

⁷⁴The PSD regulations require that the owner or operator of a proposed major source must

provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the source * * * and general commercial, residential, industrial and other growth associated with the source * * *. The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.

40 C.F.R. § 52.21(o).

used or the data relied on to estimate deposition, to identify whether the reported Fg/m^3 measurements refer to air or soil, to explain how deposition rates were converted into soil and vegetation concentrations, and to reveal whether bioaccumulation was considered. Union Pet'n at 61-62; COW Pet'n at 5-6. Petitioners also allege that the analysis is technically flawed and has not been subject to public review. Union Pet'n at 62; COW Pet'n at 5-6.

IDEM contends that very little guidance is available to instruct permit applicants and issuers on how soil and vegetation impairment analyses should be conducted. IDEM Resp. at 49. SDI echoes IDEM's sentiment, noting that the PSD regulations do not prescribe use of a particular analytical method or even specify a requisite level of detail. SDI Resp. at 77. IDEM explained this point in its response to comments, stating, "Deposition modeling is not required under PSD regulations, however IDEM has performed deposition modeling for lead and metallic hazardous air pollutants as a result of comments received." SDI Resp. at 77; ATSD at 62. IDEM consulted with EPA Region V to conduct its deposition modeling and with a dairy cow expert from Purdue University to analyze bioaccumulation issues. IDEM Resp. at 50-51; *see* ATSD at 38-40. As a consequence, both IDEM and SDI argue that IDEM went well beyond the regulatory requirements to ensure that the proposed steel mill would not have an adverse environmental impact on soils or vegetation. IDEM Resp. at 51; SDI Resp. at 76. Both parties also contend that petitioners have failed to demonstrate that IDEM's analysis is clearly erroneous or otherwise warrants review. IDEM Resp. at 50-51; SDI Resp. at 77. Amici agree on this issue with IDEM and SDI. Amicus Br. at 46-47.

The *NSR Manual* provides the following assistance in this context:

The analysis of soils and vegetation air pollution impacts should be based on an inventory of the soils and vegetation types found in the impact area. This

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inventory should include all vegetation with any commercial or recreational value. * * *

For most types of soils and vegetation, ambient concentrations of criteria pollutants below the secondary national ambient air quality standards (NAAQS) will not result in harmful effects. However, there are sensitive vegetation species (e.g., soybeans and alfalfa) [that] may be harmed by long-term exposure to low ambient air concentrations of regulated pollutants for which there are no NAAQS.

NSR Manual at D.4-.5. IDEM reports that SDI's soils and vegetation analysis examined the secondary NAAQS and found that estimated ambient concentrations from the proposed mill were below those standards.⁷⁵ IDEM Resp. at 49-50 & ex. H.

Petitioners have provided no information that contradicts IDEM's conclusion that the steel mill will not adversely affect soils and vegetation in the area. Petitioners have not shown that there are sensitive plant species that would be harmed by exposure to concentrations of pollutants below the secondary NAAQS, nor, indeed, have they proffered any rebuttal evidence whatsoever. Instead, they now claim that IDEM's analysis overlooked visibility impairment issues as well as indirect impacts from truck and commuter traffic associated with the proposed mill, contrary to the dictates of 40 C.F.R. § 52.21(o). Union Reply at 45. These new arguments were fully ascertainable at the petition stage of these proceedings and should have been raised at that time; they will not

⁷⁵While the primary NAAQS "define levels of air quality [that] the Administrator judges are necessary, with an adequate margin of safety, to protect the public health," the secondary NAAQS "define levels of air quality [that] the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant." 40 C.F.R. § 50.2(b).

be entertained for the first time here. *See* 40 C.F.R. § 124.19(a). For the foregoing reasons, review on the basis of these issues must be denied. *See In re Kawaihae Cogeneration Project*, 7 E.A.D. 107, 130 (EAB 1997) (petitioners fail to meet burden of demonstrating clear error or other basis for granting review if they fail to proffer at least some soils or vegetation evidence calling into question permit issuer's conclusion that no adverse impacts exist).

2. *Public Comment Period*

Petitioners next argue that the legion of new information submitted during and after the close of the public comment period has not been subject to public review and that, apparently, IDEM erred by choosing not to reopen the public comment period to allow public review of this information. Union Pet'n at 63-65; COW Pet'n at 3. IDEM counters by explaining that it extended the public comment period for thirty days, provided for a public hearing, and considered comments submitted by the Union after the comment period closed, all of which it had the discretion, but not a legal responsibility, to do. IDEM Resp. at 52-53 (citing 40 C.F.R. §§ 124.10(b), .12(a), .14(b)). IDEM points out that the permitting regulations anticipate that changes will occur between the draft and final permits and argues that petitioners have failed to demonstrate clear error, abuse of discretion, or other grounds for review of this issue. *Id.* (citing 40 C.F.R. § 124.19(a)); *accord* SDI Resp. at 78-81.

Where this issue has been specifically raised in the context of a particular emissions unit and/or pollutant, we have discussed it. *See, e.g., supra* Part II.B.3.b (NO_x BACT for the reheat furnace); Part II.B.4.b (PM BACT for slag-handling operations). We are not inclined to deal with it in those contexts again here, nor are we able to examine it in the broader generic sense petitioners urge. *See* Union Pet'n at 64 ("sheer number of instances of faulty findings of fact and conclusions of law and their seriousness * * * warrant recirculating a revised draft Permit for public review"). The latter option lacks sufficient specificity to merit our attention. *See, e.g., In re Envotech, L.P.*, 6 E.A.D. 260, 267-69 (EAB

1996) (under 40 C.F.R. § 124.19(a), petition for review must contain clear identification of the permit conditions at issue and argument that the conditions warrant review); *In re Beckman Prod. Servs.*, 5 E.A.D. 10, 18-19 (EAB 1994) (same). Accordingly, review on this ground is denied.

3. Other Issues Raised in COW Petition

COW raises a series of issues that do not appear in the Union's petition. These issues touch on: (1) emissions of manganese, a HAP regulated under Section 112 of the CAA; (2) use of 1996 rather than 1997 NO_x emissions data; (3) baghouse inspection frequency; (4) changes in the proposed steel mill's line of products; (5) changes in the steel mill's building location and orientation; (6) typographical errors in the permit and ATSD; (7) alleged misinterpretation and misapplication of the holding in *American Trucking Assocs., Inc. v. U.S. EPA*, 175 F.3d 1027 (D.C. Cir. 1999), *cert. granted sub nom. Browner v. American Trucking Assocs., Inc.*, 120 S. Ct. 2003 (May 22, 2000) & *American Trucking Assocs., Inc. v. Browner*, 68 U.S.L.W. 3566 (U.S. May 30, 2000); (8) public access to SDI's monitoring data; (9) construction of "cause or contribute" language in regulations; (10) ozone air quality impact analysis; and (11) notice to the State of Ohio. *See* COW Pet'n at 4, 6-9, 15, 17, 18-19. After reviewing all arguments and relevant portions of the administrative record pertaining to these issues, we find that none of the issues has merit.

First, review of issue numbers (4), (5), (8), and (11) is denied because COW did not demonstrate that these matters were raised during the public comment period and thereby preserved for review by this Board. *See, e.g., In re City of Port St. Joe*, 7 E.A.D. 275, 305 & n.48 (EAB 1997); *In re EcoEléctrica, L.P.*, 7 E.A.D. 56, 75 (EAB 1997). Second, issue number (7) has not been presented with sufficient specificity to warrant review. *See, e.g., In re Puerto Rico Elec. Power Auth.*, 6 E.A.D. 253, 255-59 (EAB 1995); *In re Inter-Power of New York, Inc.*, 5 E.A.D. 130, 153 (EAB 1994). Third, review of issue numbers (1), (2), (3), (6), (9), and (10) is denied because COW failed to

demonstrate clear error in IDEM's treatment of these issues. Accordingly, these issues will not be considered further in this appeal.

III. CONCLUSION

For the foregoing reasons, we remand three components of the permit, as summarized below, for further proceedings consistent with this opinion. First, we remand the permit for IDEM to reconsider its analysis of the proposed steel mill's potential to emit lead. IDEM must provide in the administrative record a clear rationale for its treatment of the condensable fraction of lead, including documentation of its decisionmaking process and the data upon which its decisions are based. IDEM also must consider and respond to the Union's alternative calculation of a PTE lead of 4.03 tpy.⁷⁶ *See supra* Part II.A.

Second, we remand the permit for IDEM to perform a complete analysis of SCR's cost-effectiveness as applied to SDI's reheat furnace (including comparisons of costs to other facilities and to other technologies), document its findings, submit those findings to public review, and consider and respond to significant public comments in its documentation of the final permit decision.⁷⁷ *See supra* Part II.B.3.c.

Third, we remand the permit for IDEM to reconsider the BACT limitations chosen for NO_x and CO emissions from the EAF. IDEM must explain why the limits it imposed are in lbs/hr (rather than in lbs/hr *and* lbs/ton, or lbs/ton alone), in particular explaining the differences (if any)

⁷⁶Moreover, if SDI's proposed mill is found to have a potential to emit lead in excess of the significance level, then IDEM must conduct a BACT analysis for lead emissions from the mill. In such a case, IDEM must issue its BACT determination in draft form and provide for public notice of and comment on the BACT decision.

⁷⁷If IDEM decides to base its decision on the ground that SCR is technically infeasible, and thus an economic infeasibility analysis is unnecessary, the Department must nonetheless consider and respond to all significant technical feasibility-related comments currently in the record in the documentation of its final permit decision.

between SDI's proposed mill and the fifteen similar mills discussed above in Part II.C.2 that would justify exclusive lbs/hr limits for CO and NO_x.⁷⁸ Alternatively, IDEM is ordered to impose production limits in addition to the hourly limits for these pollutants. *See supra* Part II.C.2.

Any party who participates in the remand process and is not satisfied with the Region's decision on remand may file an appeal with the Board pursuant to 40 C.F.R. § 124.19. Any such appeal shall be limited to issues within the scope of the remand. Review of all other issues is denied.

So ordered.

⁷⁸Even if IDEM is able to make such a demonstration, it must incorporate other provisions in the permit that would fully address and protect against the types of permit abuses described by the Union and Amici in Part II.C.2 above.