IN RE NORTHERN MICHIGAN UNIVERSITY RIPLEY HEATING PLANT

PSD Appeal No. 08-02

ORDER DENYING REVIEW IN PART AND REMANDING IN PART

Decided February 18, 2009

Syllabus

On May 12, 2008, the Michigan Department of Environmental Quality ("MDEQ" or "Department") issued a federal prevention of significant deterioration ("PSD") permit to Northern Michigan University ("NMU"), pursuant to Clean Air Act § 165, 42 U.S.C. § 7475. The permit authorizes NMU to construct a new circulating fluidized bed ("CFB") boiler at the Ripley Heating Plant on its campus in Marquette, Michigan. As permitted, the CFB boiler will function as a cogeneration unit that provides both electrical power and heat to NMU's facilities through the burning of wood, coal, and natural gas.

On June 13, 2008, Sierra Club filed a petition for review of this PSD permit pursuant to 40 C.F.R. part 124. In so doing, Sierra Club challenged a number of MDEQ's decisions and responses to comments pertaining to Best Available Control Technology ("BACT") requirements for the boiler's emissions of sulfur dioxide ("SO_2"), fine particulate matter ("$PM_{2.5}$"), carbon dioxide ("CO_2"), and nitrous oxide ("N_2O"). Sierra Club also challenged several aspects of the air quality analysis for the boiler, including the Department's calculation of PSD increment consumed by other emissions sources, its alleged failure to account in the air quality modeling for the CFB boiler's worst-case emissions, its refusal to require site-specific preconstruction monitoring, and its use of certain criteria to excuse analysis of impacts to "Class I" wilderness and wildlife areas.

Held: The Environmental Appeals Board ("Board") remands certain issues raised in Sierra Club's petition for review and denies review as to the remaining issues.

SO_2 BACT. The Board holds that MDEQ clearly erred in selecting BACT limits for the proposed boiler's emissions of SO_2. The Board finds that in analyzing this issue, MDEQ failed to follow the U.S. Environmental Protection Agency's ("Agency") New Source Review Manual or any other method faithful to statutory and regulatory guidelines. The Board finds that, instead, the Department prematurely narrowed the focus of its BACT analysis to a combination of minimal wood burning and predominant use of coal from two local power plants. In so doing, MDEQ failed to provide in the record the necessary threads of logic or data to sustain these fuel choices as requiring NMU to achieve emissions limitations clean enough to be BACT. The Board also rejects MDEQ's contention that requiring NMU to burn coal from sources other than the two identified local power plants would "redefine the source," holding that the record fails to sustain such a claim.

Accordingly, the Board remands the permit to MDEQ to reconsider the BACT limitations chosen for SO_2 emissions from the CFB boiler.

BACT for $PM_{2.5}$. The Board finds no clear error, abuse of discretion, or other basis for granting review of MDEQ's decision to substitute an alternative particulate matter BACT analysis for the requisite $PM_{2.5}$ BACT analysis, pursuant to the Agency's so-called "surrogate policy."

BACT for Greenhouse Gases CO_2 and N_2O. The Board remands the permit for MDEQ to analyze whether CO_2 and N_2O emissions from the CFB boiler should be limited pursuant to BACT. The Board directs MDEQ to be guided by its recent decision in *In re Deseret Power Electric Cooperative*, 14 E.A.D. 212 (EAB 2008).

PSD Increments. The Board remands the permit for MDEQ to reevaluate and clarify its analysis of PSD increment consumption/expansion in the area affected by proposed CFB boiler emissions. In so doing, the Board rejects Sierra Club's argument that the "plain language" of the statute and regulations require that *all* the emissions from a source that undergoes a major modification after an applicable "baseline" date must be treated as increment consuming. Rather, the Board holds that, under the statute, regulations, and long-standing Agency interpretation, pre-baseline emissions of a source modified after the baseline date remain as part of the baseline concentration, and only the post-baseline change in emissions from the modified source, whether upward or downward, is factored into the PSD increment consumption/expansion calculus.

Modeling of Worst-Case Emissions. The Board remands the permit so that MDEQ can ensure that the source impact modeling analyses for SO_2, particulate matter, nitrogen oxide, and carbon monoxide are conducted on the basis of the maximum, "worst-case" emissions rates of those pollutants. The Board finds that the Department failed to adequately document this analytical step in the record or meaningfully respond to significant comments questioning the modeling inputs.

Preconstruction Monitoring. The Board remands the permit for MDEQ to reevaluate the issue of preconstruction monitoring and explain, in the record, how its ultimate decisions on this topic comply with the applicable provisions of the statute and regulations and reflect Agency guidance. In so holding, the Board rejects Sierra Club's argument that the "plain language" of the statute and regulations mandate the use of site-specific, sole-purpose preconstruction ambient air quality data. The Board holds that such an argument overlooks explicit statements of congressional intent allowing the use of alternative data, and long-established Agency guidelines implementing that intent.

Class I Increment Analysis. Finally, the Board holds that MDEQ adequately addressed concerns about protecting air quality at national parks and wilderness areas that might be affected by emissions from NMU's new boiler. The Board denies review on this ground.

Before Environmental Appeals Judges Edward E. Reich, Charles J. Sheehan, and Anna L. Wolgast.

Opinion of the Board by Judge Sheehan:

On May 12, 2008, the Michigan Department of Environmental Quality ("MDEQ" or "Department") issued a federal prevention of significant deterioration

("PSD") permit to Northern Michigan University ("NMU" or "University"), pursuant to Clean Air Act § 165, 42 U.S.C. § 7475. The permit authorizes NMU to construct a new circulating fluidized bed ("CFB") boiler at the Ripley Heating Plant on the University's campus in Marquette, Michigan. As permitted, the CFB boiler will function as a cogeneration unit that provides both electrical power and heat to NMU's facilities through the burning of wood, coal, and natural gas. On June 13, 2008, Sierra Club filed a petition for review of this PSD permit pursuant to 40 C.F.R. part 124, requesting on a number of grounds that the permit be remanded to MDEQ for further consideration. For the reasons set forth below, the Environmental Appeals Board ("Board") remands certain issues raised in Sierra Club's petition for review and denies review as to the remaining issues.[1]

I. *BACKGROUND*

A. *Statutory and Regulatory Background*

In 1977, Congress enacted the PSD provisions of the Clean Air Act ("CAA" or "Act") with a number of specific goals in mind. Among other things, Congress intended "to insure 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). Congress also intended "to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decisionmaking process." CAA § 160(5), 42 U.S.C. § 7470(5).

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[1] MDEQ is authorized to administer the PSD permitting program within the State of Michigan pursuant to a delegation agreement with Region 5 of the U.S. Environmental Protection Agency. *See* 40 C.F.R. § 52.21(u); 45 Fed. Reg. 8348 (Feb. 7, 1980). In accordance with the delegation agreement and applicable regulations, MDEQ-issued PSD permit decisions are considered for procedural purposes to be federally issued PSD permit decisions. *See* 40 C.F.R. § 124.41 (the terms "EPA" and "Regional Administrator" mean the delegate agency and its head, respectively, when a state exercises delegated authority to administer the PSD permit program); 45 Fed. Reg. 33,290, 33,413 (May 19, 1980) ("For the purposes of Part 124, a delegate [s]tate stands in the shoes of the Regional Administrator. Like the Regional Administrator, the delegate must follow the procedural requirements of part 124. * * * A permit issued by a delegate is still an 'EPA-issued permit.'"). Consequently, appeals of MDEQ's PSD permit decisions are required to be brought pursuant to 40 C.F.R. § 124.19 and heard by EPA's Environmental Appeals Board. *See, e.g.*, *In re Hillman Power Co.*, 10 E.A.D. 673, 675 (EAB 2002); *In re Gen. Motors, Inc.*, 10 E.A.D. 360, 362 & n.2 (EAB 2002); *In re Tondu Energy Co.*, 9 E.A.D. 710, 711-12 n.1 (EAB 2001); *In re Indeck-Niles Energy Ctr.*, PSD Appeal No. 04-01, at 1 (EAB Sept. 30, 2004) (Order Denying Review); *In re S. Shore Power LLC*, PSD Appeal No. 03-02 (EAB June 4, 2003) (Order Denying Review); *In re Tallmadge Generating Station*, PSD Appeal No. 02-12, at 1 (EAB May 21, 2003) (Order Denying Review in Part and Remanding in Part); *In re Select Steel Corp. of Am.*, PSD Appeal No. 98-21, at 1 n.1 (EAB Sept. 11, 1998) (Order Denying Review).

Toward these ends, Congress established a PSD permitting program that is applicable 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," or "NAAQS." *See* CAA §§ 161, 165, 42 U.S.C. §§ 7471, 7475. Congress charged the U.S. Environmental Protection Agency ("EPA" or "Agency") with developing NAAQS for air pollutants whose presence in the atmosphere above certain concentration levels could "reasonably be anticipated to endanger public health and welfare." CAA § 108(a)(1)(A), 42 U.S.C. § 7408(a)(1)(A); *see* CAA § 109, 42 U.S.C. § 7409. To date, EPA has promulgated NAAQS for six air contaminants: (1) sulfur oxides (measured as sulfur dioxide ("SO_2")); (2) particulate matter (measured as "PM_{10}," denoting particulates 10 micrometers or less in diameter, or as "$PM_{2.5}$," denoting particulates 2.5 micrometers or less in diameter);[2](3) carbon monoxide ("CO"); (4) ozone (measured as volatile organic compounds ("VOCs") or as nitrogen oxides ("NO_x")); (5) nitrogen dioxide ("NO_2"); and (6) lead. 40 C.F.R. §§ 50.4-.12.

In geographical areas deemed to be in "attainment" for any of these pollutants, the ambient air quality meets the NAAQS for that pollutant. CAA § 107(d)(1)(A)(ii), 42 U.S.C. § 7407(d)(1)(A)(ii). In areas designated "unclassifiable," air quality cannot be classified on the basis of available information as meeting or not meeting the NAAQS. CAA § 107(d)(1)(A)(iii), 42 U.S.C. § 7407(d)(1)(A)(iii). Areas may also be designated as "nonattainment," meaning that the concentration of a pollutant in the ambient air does not meet the NAAQS for that pollutant. CAA § 107(d)(1)(A)(i), 42 U.S.C. § 7407(d)(1)(A)(i). The PSD program is not applicable, however, in nonattainment areas. *See* CAA § 161, 42 U.S.C. § 7471.

Parties that wish to construct "major emitting facilities"[3] in attainment or unclassifiable areas must obtain preconstruction approval, in the form of PSD permits, to build such facilities. CAA § 165, 42 U.S.C. § 7475. Applicants for these

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[2] "Particulate matter" 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." National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652, 38,653 (July 18, 1997). As noted above, particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as "PM_{10}." *Id.* at 38,653 n.1; *see* 40 C.F.R. § 50.6(c). PM_{10} is comprised of two principal fractions, referred to as "fine" and "coarse" particulate matter. 62 Fed. Reg. at 38,654. Fine particulate matter, labeled "$PM_{2.5}$," has an aerodynamic diameter of 2.5 micrometers or less, while coarse particulate matter has an aerodynamic diameter greater than 2.5 but less than or equal to 10 micrometers. *Id.* nn.5-6; *see* 40 C.F.R. § 50.7(a). EPA has promulgated separate NAAQS for PM_{10} and $PM_{2.5}$. *See* 40 C.F.R. §§ 50.6-.7.

[3] A "major emitting facility" is a stationary source in any of certain listed stationary source categories that, in new or modified form, emits or has the potential to emit 100 tons per year ("tpy") or more of any air pollutant, or any other new or modified stationary source that has the potential to emit 250 tpy or more of any air pollutant. *See* CAA § 169(1), (2)(C), 42 U.S.C. § 7479(1), (2)(C).

permits must achieve emissions limits established by the "best available control technology," or "BACT," for pollutants emitted from their facilities in amounts greater than applicable levels of significance.[4] CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(b)(23), (j)(2)-(3). Applicants also 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 exceedance of any applicable air quality standard or related criterion. *See* CAA § 165(a)(3), 42 U.S.C. § 7475(a)(3) (listing three categories of compliance standards); 40 C.F.R. § 52.21(k)-(m).

B. *Factual and Procedural Background*

On February 5, 2007, NMU filed an application with MDEQ for permission to construct a new CFB boiler on its campus near Lake Superior in Michigan's Upper Peninsula. *See* Petition for Review Ex. 4 (NTH Consultants, Ltd., *Permit to Install Application for a Circulating Fluidized Bed (CFB) Boiler at Northern Michigan University* (Feb. 5, 2007)) ("Permit Appl."). The boiler, which will include a steam turbine, generator, and associated equipment, is designed to serve as a cogeneration unit that provides 120,000 pounds of steam per hour and ten megawatts of electrical power to NMU's facilities. Permit Appl. § 2.0, at 3; Petition for Review Ex. 5 (MDEQ, *Public Participation Documents for Northern Michigan University Ripley Heating Plant: Fact Sheet* 1 (Oct. 19, 2007)) ("Fact Sheet"). By proposing this project, NMU hopes to expand the reliability and efficiency of its existing powerhouse operations, which are conducted out of the Ripley Heating Plant on the north end of campus.[5] Fact Sheet at 1.

At present, the Ripley Heating Plant is comprised of three natural gas- and No. 2 fuel oil-fired boilers, the oldest of which has been in operation since 1967, along with emissions control equipment and associated infrastructure. *See id*.; Permit Appl. § 6.2, at 57 & app. A (site drawings). NMU plans to construct the CFB boiler in a new building immediately adjacent to the building housing the three existing boilers. Permit Appl. §§ 2.0, 6.2, at 3, 57; Fact Sheet at 1. The new boiler, unlike the older ones, will be designed to burn solid fuels, including bituminous and subbituminous coals and wood. Permit Appl. § 2.1, at 3; *see* Fact Sheet at 1. The boiler will also be designed to combust natural gas, which NMU

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[4] The level of significance is, for example, 100 tpy for CO, 40 tpy for NO_x, 40 tpy for SO_2, 25 tpy for total particulate matter, and 15 tpy for PM_{10}. 40 C.F.R. § 52.21(b)(23)(i) (listing various air pollutants and levels of emissions deemed "significant"). The level of significance for any other pollutant "regulated under the Act" but not listed in 40 C.F.R. § 52.21(b)(23)(i) is "any emissions rate." *Id*. § 52.21(b)(23)(ii).

[5] While not discussed in the administrative record, NMU indicates that there is another motive driving its new boiler proposal: namely, avoidance of $1 million or more annually in heating and electricity costs. Intervenor Northern Michigan University's Brief in Response to Petition [Corrected] 3 (Sept. 23, 2008).

proposes to use during boiler startup operations and as a backup fuel when neither coal nor wood is available. Permit Appl. § 2.1, at 3.

NMU plans to obtain coal exclusively from two "nearby" utilities: (1) the Marquette Board of Light and Power ("Marquette"); and (2) We Energies' Presque Isle Power Plant ("Presque Isle"). *Id.*; Fact Sheet at 2. The University also plans to obtain wood from independent suppliers and pipeline-quality natural gas from its campus natural gas supplier. Permit Appl. § 2.1, at 3; Fact Sheet at 2. NMU has arranged for shipments of the solid fuels to arrive by truck every day on average, except weekends, with a typical shipment consisting of forty tons of coal "and/or" forty tons of wood. Permit Appl. §§ 2.2, 2.2.1, at 4. The University plans to construct silos to hold a three-day supply of the coal and/or wood fuels, which will allow boiler operation through weekends and holidays.[6] *Id*. § 2.2, at 4. NMU projects that the annual maximum deliveries of solid fuels for the boiler will be in the range of "68,669 tons of bituminous coal, 95,329 tons of [Powder River Basin] coal, and 199,533 tons of wood." *Id*. § 2.2.1, at 4.

NMU's proposed installation of a new CFB boiler at the Ripley Heating Plant is considered a "major modification" that will result in a significant net increase in emissions of SO_2, PM_{10}, CO, and NO_x from the facility. *See* Permit Appl. §§ 4.1 tbl. 4-1, 5.0, 6.0, at 24, 33, 51-52 (three existing boilers' potential to emit SO_2, PM_{10}, CO, and NO_x is limited by permit to 99.9 tpy for each pollutant, while projected emissions from the new CFB boiler are 388.9 tpy of SO_2, 26.9 tpy of PM_{10}, 152.6 tpy of CO, and 89.8 tpy of NO_x); 40 C.F.R. § 52.21(b)(23)(i) (net emissions increase levels deemed "significant" are 40 tpy for SO_2, 15 tpy for PM_{10}, 100 tpy for CO, and 40 tpy for NO_x). Moreover, the University is located within Marquette County, Michigan, an area designated as attainment or unclassifiable for SO_2, CO, ozone, PM_{10}, and NO_2. *See* 40 C.F.R. § 81.323 (Michigan air quality status). Accordingly, PSD compliance is required under federal law.

MDEQ reviewed NMU's application for a PSD permit, which included BACT and air quality analyses for the CFB boiler. *See*, *e.g.*, Response of MDEQ Ex. 7 (MDEQ, *Permit Evaluation Form: Northern Michigan University* (2007)) ("Permit Eval. Form"); *id*. Ex. 9 (MDEQ, *Air Dispersion Analysis Summary, NMU – Ripley Heating Plant* (May 8, 2007)). Upon examination of a proposed SO_2 emissions limit of 0.2 pounds per million British Thermal Units ("lb/MMBtu") of heat input, MDEQ determined that a lower BACT limit might be within reach of the boiler, so the Department requested an additional BACT analysis from NMU. Permit Eval. Form at 3. NMU complied with the Department's request by submitting a permit application addendum on September 18, 2007. *See* Letter from Jeffrey P. Jaros, Project Manager, NTH Consultants, Inc., to David Riddle, Senior

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[6] As discussed *infra* note 22 and accompanying text, MDEQ's representation at oral argument was at variance from this record, asserting that there will be three days' storage space for each fuel.

Environmental Engineer, MDEQ, *Addendum to Application No. 60-07 to Update SO_2 Emission Limit, Northern Michigan University – Ripley Heating Plant* (Sept. 18, 2007) ("Permit Appl. Add.").

On October 19, 2007, MDEQ issued a draft PSD permit containing proposed terms and conditions to regulate the CFB boiler. That same day, the Department published a notice inviting public comment on the draft permit and establishing a comment period, which ran through December 27, 2007. On November 27, 2007, MDEQ held a public hearing on the draft permit at the Marquette City Hall. The Department accepted numerous oral and written comments on the draft permit from interested individuals and organizations, including Sierra Club. *See, e.g.*, Petition for Review Ex. 2 (Letter from David C. Bender & Bruce E. Nilles, Sierra Club, to William Presson, MDEQ (Dec. 24, 2007)) ("SC Cmts."). On May 12, 2008, after reviewing the public comments on the draft permit, MDEQ issued a document responding to the comments, along with a final PSD permit authorizing NMU's construction of the CFB boiler. *See id.* Ex. 6 (MDEQ, *Response to Comments Document for PSD Permit No. 60-07, Northern Michigan University, Ripley Heating Plant* (May 12, 2008)) ("RTC Doc."); *id.* Ex. 1 (MDEQ, Permit to Install No. 60-07 (May 12, 2008)) ("Permit").

On June 13, 2008, Sierra Club filed PSD Appeal No. 08-02 with this Board. *See* Petition for Review and Request for Oral Argument (June 13, 2008) ("Pet'n"). At the request of the Board, and after a granted motion for an extension, MDEQ submitted a response to the merits of the petition for review on August 5, 2008. *See* Response of the Michigan Department of Environmental Quality (Aug. 5, 2008) ("MDEQ Resp."). On August 21, 2008, by leave of the Board, Sierra Club filed a reply to MDEQ's response. *See* Petitioner's Reply Brief (Aug. 21, 2008) ("Reply to MDEQ"). On September 5, 2008, NMU filed a motion to intervene as a party, which the Board granted, and, on September 23, 2008, the University filed a corrected response to Sierra Club's petition. *See* Intervenor Northern Michigan University's Brief in Response to Petition [Corrected] (Sept. 23, 2008) ("NMU Resp."). Sierra Club then sought and received permission to file a reply to NMU's response, which the Board accepted as filed on October 3, 2008, after Sierra Club sought leniency for an out-of-time filing. *See* Sierra Club's Reply to Intervenor Northern Michigan University's Brief in Response to Petition (Oct. 3, 2008) ("Reply to NMU"). On October 22, 2008, the Board heard oral argument in this dispute. *See* Oral Argument Transcript (Oct. 22, 2008) ("OA Tr."). The case now stands ready for decision by the Board.

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(a); 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 [permit issuer's] level." 45 Fed. Reg. at 33,412; *accord In re Cardinal FG Co.*, 12 E.A.D. 153, 160 (EAB 2005). The burden of demonstrating that review is warranted rests with the petitioner, who must raise objections to the permit and explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review. *In re BP Cherry Point*, 12 E.A.D. 209, 217 (EAB 2005); *In re Steel Dynamics, Inc.*, 9 E.A.D. 740, 744 (EAB 2001).

The question presently before the Board is whether Sierra Club has made a sufficient showing that any condition of the PSD permit is clearly erroneous or involves an important matter of policy or exercise of discretion warranting review. In its petition, Sierra Club begins by challenging MDEQ's decisions regarding BACT requirements for SO_2, $PM_{2.5}$, carbon dioxide, and nitrous oxide emissions from the CFB boiler. We address each of these matters in Parts II.A.1-.4 below. Sierra Club then raises a series of challenges to MDEQ's air quality analysis for this permit.[7] We address these matters in Parts II.B.1-.4 below.

A. *BACT Issues*

1. *Introduction*

As noted above, NMU proposes a new solid fuel-fired CFB boiler near its Ripley Heating Plant. "In support of the Governor's 21st Century Energy Plan," the boiler is "designed to allow operation on Renewable Resources (specifically wood chips) up to 100% of the total heat input." Letter from Michael G. Hellman, Facilities Specialist/Planner, NMU, to Mary Ann Dolehanty, MDEQ 1 (Feb. 5, 2007) (permit application cover letter). This "preference" for renewable resources, however, yields to coal and natural gas if renewable resources are unavailable or not economically feasible. *Id*. The result, notwithstanding NMU's stated intention as late as its permit application addendum that wood be the "primary fuel," Permit Appl. Add. at 1, is a permit allowing coal burning over twenty-two days per month. Fact Sheet at 4.

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[7] Sierra Club also argued that MDEQ erred in its treatment of several matters pertaining to boiler startup, shutdown, and malfunction ("SSM"). *See* Pet'n at 38-39 (alleging failure to ensure SSM plan received appropriate public notice and comment), 42-43 (alleging failure to model potential uncontrolled emissions during SSM periods). Sierra Club withdrew these elements of its appeal after receiving clarification of SSM matters in MDEQ's response to the petition. Reply to MDEQ at 20-21, 22 & n.10; *see* MDEQ Resp. at 17-18. For this reason, we do not address SSM issues further.

2. *Overview of Legal Requirements*

As mentioned in Part I.A above, the Act and Agency PSD regulations make major new stationary sources and major modifications, such as the NMU facility, subject to BACT for emissions of certain pollutants. CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j)(2). The BACT requirement is defined as follows:

> [BACT] means an emissions limitation based on the maximum degree of reduction of each pollutant subject to regulation under [the Act] emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.

CAA § 169(3), 42 U.S.C. § 7479(3); *accord* 40 C.F.R. § 52.21(b)(12) (similar regulatory definition of BACT).

This high threshold demands corresponding exertions from permitting authorities. Proceeding "on a case-by-case basis," CAA § 169(3), 42 U.S.C. § 7479(3), taking a "careful and detailed" look, *In re Cardinal FG Co.*, 12 E.A.D. 153, 162 (EAB 2005), attentive to the "technology or methods appropriate for the particular facility," *In re Prairie State Generating Co.*, 13 E.A.D. 1, 121 (EAB 2006), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007), they are to seek the result "tailor-made" for that facility and that pollutant. *In re CertainTeed Corp.*, 1 E.A.D. 743, 747 (Adm'r 1982), *cited in*, *e.g.*, *In re Christian County Generation, LLC*, 13 E.A.D. 449, 454 (EAB 2008); *In re Three Mountain Power, LLC*, 10 E.A.D. 39, 47 (EAB 2001).

The analytical rigor demanded by Congress has found widely adopted expression in a guidance manual issued by EPA's Office of Air Quality Planning and Standards in 1990. *See generally* Office of Air Quality Planning & Standards, U.S. EPA, *New Source Review Workshop Manual* (draft Oct. 1990) ("NSR Manual"). While not binding Agency regulation or the required vehicle for making a BACT determination, *Prairie State*, 13 E.A.D. at 13, the NSR Manual offers the "careful and detailed analysis of [BACT] criteria" required by the CAA and regulations. *Cardinal*, 12 E.A.D at 162. For this reason, it has guided state and federal

permitting authorities on PSD requirements and policy for many years.[8] *E.g.*, *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 183 (EAB 2000) ("[t]his 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"); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 129 n.14, 134 n.25 (EAB 1999) (same). The Board has commonly used it as a touchstone for Agency thinking on PSD issues. *E.g.*, *In re Deseret Power Elec. Coop.*, 14 E.A.D. 212,220 n.7 (EAB 2008); *In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 133 n.13, 158-59 & n.65 (EAB 2006).

The NSR Manual's "top-down" method is simply stated: assemble all available control technologies, rank them in order of control effectiveness, and select the best. So fixed is the focus on identifying the "top," or most stringent alternative, that the analysis presumptively ends there and the top option selected – "unless" technical considerations lead to the conclusion that the top option is not "achievable" in that specific case, or energy, environmental, or economic impacts justify a conclusion that use of the top option is inappropriate. NSR Manual at B.2, .7-.8, .24, .26. In those events, remaining options are then reranked, the several factors applied, and so on until a "best" technology emerges out of this winnowing process.[9]

More specifically, the top-down method unfolds over five steps. *E.g.*, NSR Manual at B.5-.9; *see Prairie State*, 13 E.A.D. at 13-14 (summarizing steps). The first step requires the permitting authority to identify all "potentially" available control options. NSR Manual at B.5. Available control options are those technologies, including the application of production processes or innovative technologies, that have "a practical potential for application to the emissions unit and the regulated pollutant under evaluation," *id*., including technology required under the

[8] In 2007, EPA reaffirmed the viability of the NSR Manual for guiding BACT analyses. 72 Fed. Reg. 31,372, 31,380 (June 6, 2007) ("it remains EPA's policy to use the five-step, top-down process [set forth in the NSR Manual] to satisfy the [BACT] requirements when PSD permits are issued by EPA and delegated permitting authorities").

[9] As a general matter, the Board will not fault a BACT analysis simply for deviating from the NSR Manual's five-step structure. We will, however, carefully examine each analysis to ensure a defensible BACT determination that reflects consideration of all relevant statutory and regulatory criteria in the PSD permitting program. *See*, *e.g.*, *In re ConocoPhillips Co.*, 13 E.A.D. 768, 787-94 (EAB 2008) (remanding BACT determination for petroleum refinery flare CO emissions due to lack of adequate analysis establishing that permit issuer considered all relevant statutory and regulatory criteria); *Knauf*, 8 E.A.D. at 134-44 (remanding BACT analysis conducted for fiberglass plant's emissions of PM_{10} because explanations of competing control options and other technical matters were insufficiently detailed to demonstrate compliance with PSD program requirements).

lowest achievable emission rate ("LAER").[10] *Id.* at B.10-.17; *see, e.g., Prairie State*, 13 E.A.D. at 14-28 (applying step one analysis); *Steel Dynamics*, 9 E.A.D. at 183-86 (evaluating challenge to permit issuer's step one analysis).

The second step eliminates "technically infeasible" options from the potentially available options. NSR Manual at B.7. This involves first determining for each technology whether it is "demonstrated," i.e., installed and operated successfully elsewhere on a similar facility, or, if not demonstrated, whether it is both "available" and "applicable."[11] *Id.* at B.17-.22. Technologies identified in step one as "potentially" available, but neither demonstrated nor found to be both available and applicable, are eliminated under step two from further analysis. *Id.*; *see, e.g., Prairie State*, 13 E.A.D. at 34-38 (evaluating step two analysis); *Cardinal*, 12 E.A.D. at 163-68; *Steel Dynamics*, 9 E.A.D. at 199-202; *In re Maui Elec. Co.*, 8 E.A.D. 1, 13-16 (EAB 1998).

In step three, remaining control technologies are ranked and then listed in order of control effectiveness for the pollutant under review, with the most effective alternative at the top. NSR Manual at B.7. A step three analysis includes making determinations about comparative control efficiencies among control techniques employing different emission performance levels and different units of measure of their effectiveness. *Id.* at B.22-.26; *see, e.g., In re Newmont Nev. Energy Inv., LLC*, 12 E.A.D. 429, 459-64 (EAB 2005) (evaluating challenge to step three analysis).

In the fourth step, energy, environmental, and economic impacts are considered and the top alternative is either confirmed as appropriate or is determined to be inappropriate. NSR Manual at B.8-.9, .26-.53. The cost effectiveness of the alternative technologies is considered under this step. *Id.* at B.31-.46. Step four thus validates the suitability of the top control option identified or provides a clear justification as to why the top control option should not be selected as BACT. *Id.* at B.26; *see, e.g., Prairie State*, 13 E.A.D. at 46-51 (applying step four analysis; evaluating all three collateral impacts); *Three Mountain Power*, 10 E.A.D.

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[10] The LAER requirement provides that all affected sources must comply with either the most stringent limit contained in a state implementation plan or the most stringent emission limit achieved in practice, whichever is more stringent. In contrast, under BACT, consideration of energy, environmental, or economic impacts may justify a lesser degree of control. *Compare* 40 C.F.R. § 52.21(b)(12) (definition of BACT) *with id.* §§ 51.165(a)(1)(xiii), .166(b)(52) (definition of LAER). The NSR Manual suggests that LAER determinations "are available for BACT purposes and must also be included as control alternatives" during step one of the BACT analysis and "usually represent the top alternative." NSR Manual at B.5.

[11] According to the NSR Manual, a technology is considered "available" if it "can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term." NSR Manual at B.17. An "available" technology is considered "applicable" if it "can reasonably be installed and operated on the source type under consideration." *Id.*

at 56-59 (evaluating environmental impacts); *Steel Dynamics*, 9 E.A.D. at 202-07, 212-13 (evaluating economic impacts).

Finally, under step five, the most effective control alternative not eliminated in step four is selected and the permit issuer sets as BACT an emissions limit for a specific pollutant that is appropriate for the selected control method. NSR Manual at B.53-.54; *see, e.g.*, *Prairie State*, 13 E.A.D. at 51-85 (step five analysis).

The NSR Manual thus exacts thoughtful, substantial efforts by reviewing authorities. Not merely an option-gathering exercise with casually considered choices, the NSR Manual or any BACT analysis calls for a searching review of industry practices and control options, a careful ranking of alternatives, and a final choice able to stand as first and best. If reviewing authorities let slip their rigorous look at "all" appropriate technologies, if the target ever eases from the "maximum degree of reduction" available to something less or more convenient, the result may be somewhat protective, may be superior to some pollution control elsewhere, but it will not be BACT.

3. *MDEQ's BACT Analysis*

The greater part of Sierra Club's challenge centers on particular BACT issues. We take up each in turn. But with conformity to federal standards the central question, and with NMU and MDEQ having chosen to rely on a state document purporting to guide them through their BACT responsibilities, *see* Permit Appl. § 5.1, at 33, we first briefly assess those state procedures.

a. *General Conformity with Clean Air Act and Federal Guidelines*

The alignment between the NSR Manual and NMU's BACT analysis, as approved by MDEQ, is, at best, imperfect. The permit application itself commences with inconsistent objectives, the first paragraph assuring that NMU performed the review "in accordance with the U.S. EPA's recommended top-down procedure outlined in the [NSR Manual]," Permit Appl. § 5.0, at 33, the second apparently quite the opposite – that the review follows a "more streamlined analysis by circumventing the rigorous approach set forth in the [NSR Manual]." *Id.* § 5.1, at 33.

The "more streamlined" procedure is MDEQ's "Operational Memorandum No. 20." *See* Air Quality Division, MDEQ, *Operational Memorandum No. 20: Best Available Control Technology (BACT) Determinations* (Aug. 24, 2005) ("State Manual"). Even brief examination shows it to run largely against the current of EPA's NSR Manual. The latter's tenet of settling on the "top" technology – "unless" that technology's achievement is demonstrably not possible, in which case additional reviews run until an achievable "best" is identified, NSR Manual

at B.2 – appears in the State Manual to transform into a four-level series of generally downward slips, away from the "top" control.[12]

Alignment with the NSR Manual appears to occur in Level 4, which liberally paraphrases the Manual's five steps in its opening words.[13] State Manual at 4. But the comparison fades with the State Manual's suggestion that their "best interests" usually counsel both applicant and MDEQ to "avoid" the NSR Manual, since the NSR Manual is "[h]ighly complex and quantitative," "[d]ifficult to agree upon," and "[t]ime and resource intensive." *Id*. at 5.

The adequacy of MDEQ's BACT determinations turn on their individual merits. The foundation beneath them, however, the State Manual, stands apart from federal standards.

b. *SO_2 BACT: Clean Fuels*

In its brief list of BACT production processes, methods, systems, and techniques, Congress sounds one prominent note: fuels. CAA § 169(3), 42 U.S.C. § 7479(3). In addition to "fuel cleaning" and "treatment or innovative fuel combustion techniques," the remaining listed control is "clean fuels." *Id*. Congressional direction to permitting applicants and public officials is emphatic. In making BACT determinations, they are to give prominent consideration to fuels. Board cases frequently underscore this charge. *See, e.g.*, *In re Prairie State Generating Co.*, 13 E.A.D. 1, 14-28 (EAB 2006), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007); *In re Hillman Power Co.*, 10 E.A.D. 673, 677-79, 688-92 (EAB 2002); *In re Maui Elec. Co.*, 8 E.A.D. 1, 7-16 (EAB 1998); *In re Inter-Power of N.Y., Inc.*, 5 E.A.D. 130, 134 (EAB 1994); *In re Old Dominion Elec. Coop.*, 3 E.A.D. 779, 793-94 (Adm'r 1992).

The cleanest fuel choice for the NMU facility, argues Sierra Club, is wood.[14] Its permit limits, however, allow NMU to burn coal "more than"

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[12] Level 1, for example, begins tracking NSR Manual language by requiring identification of the "top control," i.e., LAER. State Manual at 2. It then departs from the NSR Manual's "unless" clause by allowing non-selection of LAER for no stated reason, sending the applicant to Level 2. Levels 2 and 3 continue to point the permit applicant toward successively less stringent options. Neither Level 2's identification of BACT for "the same or similar source types anywhere in the nation," *id.*, nor Level 3's for "different processes or industry types," *id.* at 3, purport to seek out the "top" technology.

[13] Indeed, the permit applicant ventures the view that Level 4 "mirrors" the NSR Manual's top-down approach. Permit Appl. § 5.1, at 35.

[14] The parties do not dispute that wood produces lower sulfur emissions when burned than coal. For information on contaminants emitted during the combustion of these fuels, see Office of Air Quality, Planning & Standards, U.S. EPA, I *Compilation of Air Pollutant Emission Factors AP-42: Stationary Point and Area Sources* chs. 1.1.3, 1.6.3, at 1.1-3 to -5, 1.6-2 to -3 (5th ed. 1995, rev'd Sept. 1998 & Sept. 2003).

twenty-two days per month and wood just over seven days per month. Fact Sheet at 4 (discussion of basis for SO_2 limits); Permit Eval. Form at 3 (comparing relative wood-to-coal fuel mix allowed by various SO_2 emission limits). Coal will be supplied from two, and only two, sources: Marquette and Presque Isle, both "nearby" electrical generating facilities. Fact Sheet at 2; RTC Doc. at 19-20. Each facility will supply coal that is restricted, by its own PSD permit, to a specified maximum sulfur content. BACT limits were "established based on the characteristics" of the coal with the higher allowable sulfur content of the two, 1.5%. RTC Doc. at 20; *see* Permit spec. cond. 1.3, at 7 (sulfur content of coal burned in CFB boiler "shall not exceed a maximum of 1.5 percent by weight, calculated on the basis of 12,000 Btu per pound of coal").[15] Because these fuel choices – minimal use of wood and primary use of Marquette and Presque Isle coal – form the two pillars beneath the ultimate BACT limits, we carefully examine the basis for each.[16]

i. *Record for State Conclusions: Minimal Use of Wood and Exclusive Use of Marquette and Presque Isle Coal*

(a) *Minimal Use of Wood*

MDEQ's permit evaluation form presents three scenarios of days-of-wood-burning per month to days-of-coal-burning per month, ranging from a high of 500 hours (i.e., twenty days plus twenty hours) of wood burning to a low of 184 hours (i.e., seven days plus sixteen hours) of wood burning. *See* Permit Eval. Form at 3-4. The 500-hours scenario yields the lowest sulfur emission limit on a thirty-day average, 0.07 lb/MMBtu. *Id*. at 3. The 184-hours option produces the highest limit, 0.15 lb/MMBtu. *Id*. MDEQ selected the highest limit. *Id*.; Permit spec. cond. 1.1e, at 6 (thirty-day rolling average SO_2 limit).

Parsing the record for the reasoning behind MDEQ's choice yields little light. As between the availability of wood and coal, the documentation is neutral, their characteristics indistinguishable. Both the fact sheet and the permit evaluation form acknowledge storage limited to "three days['] fuel supply" but do not differentiate between wood and coal such that either would be in greater supply.

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[15] Inconsistent statements in the record hinder absolute certainty on the source of the higher sulfur coal. *Compare* Permit Eval. Form at 4 (stating that Marquette is limited by permit to 1.5% sulfur coal and Presque Isle to 1.0% sulfur coal), *and* Permit Appl. Add. at 2 (Marquette coal has 1.5% sulfur content at 12,500 Btu/lb), *with* RTC Doc. at 20 (Presque Isle coal "may, by permit, contain up to 1.5% sulfur").

[16] MDEQ generally complimented NMU's BACT determination efforts. *See, e.g.*, RTC Doc. at 17 ("[t]he BACT limits are appropriate for this facility"); *id*. at 20 (MDEQ "completed a thorough BACT review").

Fact Sheet at 2; Permit Eval. Form at 4. Likewise, both recognize inclement weather's possible disruption of "any" fuel deliveries, again without either fuel singled out as more likely to suffer the effects. Fact Sheet at 2; Permit Eval. Form at 4. Yet, at the critical point of allocating fuel proportions in the permit, wood's demonstrably lower sulfur emissions and apparent equal availability to coal seemingly have no persuasive weight and are dismissed without explanation. The result is MDEQ's decision: coal usage over wood, by a margin of nearly three to one.

(b) *Exclusive Use of Marquette and Presque Isle Coal*

Commitment to these two coal sources alone was early and, through to the latter stages of the process, unvarying. From the initial permit application to the much later permit evaluation, NMU and MDEQ settled on precisely the same expression of their wishes – that all coal "will" come from either Marquette or Presque Isle. Permit Appl. § 2.1, at 3; Permit Eval. Form at 4; *see also* Permit Appl. Add. at 2 ("it is expected that the coal will come from" Marquette with Presque Isle "as a backup supplier"). This unwavering preference echoes elsewhere in the record, for example, in the Department's claim of "no [storage] space" beyond that set aside for coal from these "local power plants." RTC Doc. at 20. Indeed, although the record reflects that other coal, relative to Marquette and Presque Isle coal, will produce the lowest sulfur emissions, MDEQ proceeds without explaining why these sources are unavailable or not technically feasible.[17]

In one striking instance, the Department notes that "[o]ne of the lowest [power plant] emission limits found" in its database review is 0.05 lb/MMBtu, using 0.9% sulfur coal. Permit Eval. Form at 3 (twenty-four hour average SO_2 limit for 270-megawatt power plant; permit issued in 2004). Although this limit is considerably less than NMU's final permitted limit, MDEQ nonetheless declined to consider it as BACT, offering not a word of explanation for not choosing it.

In another part of the record, drawing in on particular characteristics of the proposed NMU plant (i.e., CFB boiler without scrubbers), MDEQ assembles a list of five similar permitted coal burning facilities and their sulfur emission limits. *See* Permit Eval. Form at 3. The lowest limit of the five is 0.103 lb/MMBtu for a

[17] MDEQ also neglects to fully analyze the possibility of natural gas as a fuel source. NMU identifies natural gas in its permit application as a fuel that "will be used primarily for boiler startup" and at "any other times when solid fuel firing may not be available" as a backup fuel source. Permit Appl. § 2.1, at 3. NMU explains further that its existing natural gas supplier will provide it with "pipeline quality gas," *id*., and mentions in its own BACT analysis that "pipeline quality natural gas and wood are lower in sulfur content than coal fuels." *Id*. § 5.3, at 40. Despite these references (which imply that natural gas is an available and technically feasible fuel for the CFB boiler), MDEQ's BACT analysis contains no evaluation of this fuel as a technological option that could potentially allow NMU to achieve very low emissions of SO_2 or other pollutants.

44-megawatt facility – closest in power production by a wide margin to NMU's[18] – and, since permitted in 2006, the most currently reviewed facility of the group. *Id*. Again, the lower limit is not chosen and compelling BACT data are inexplicably passed over without the Department attempting even the barest justification.

ii. *Reasonableness of MDEQ's Conclusions*

(a) *Minimal Use of Wood*

(1) *Inclement Weather*

MDEQ roots its commitment to only some seven days of wood burning per month in its determination that winter snows impede wood delivery. RTC Doc. at 19. This finding does not withstand the implications of its own record.

First, if snow makes uncertain the availability of "any" fuel deliveries, the Department fails to clarify why the consequences fall only on wood, and not on Marquette or Presque Isle coal deliveries.[19] *See* RTC Doc. at 19, 24; Permit Eval. Form at 4; Fact Sheet at 2. Discrepancies in the record with such an overwhelming tilt in favor of coal erode confidence in MDEQ's conclusion. For example, many statements expressly connect winter weather to disruptions not just of coal, but of "any" fuel supplies. *E.g.*, RTC Doc. at 24; Permit Eval. Form. at 4.[20]

Second, even assuming, as did the permit, disproportionate weather impacts on the order of making coal three times as available as wood, *see* Permit Eval. Form at 3, the factual predicate does not sustain the conclusion. The furthest reach of inclement weather is "winter or * * * spring," RTC Doc. at 19, yet the permit sets a static, year-round assumption of twenty-two days of coal to seven days of wood availability per month.[21]

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[18] The four other facilities have one or two CFB boilers that range in size from 250 to 660 megawatts. Permit Eval. Form at 3.

[19] "If only coal can be obtained * * * " – so the Department paints the sole consequence of severe winter weather. RTC Doc. at 24. Absent without explanation is the no less plausible result of winter snows: that only wood can be obtained.

[20] A lone phrase in one of MDEQ's responses to comments, without explanation and implausibly, converts weather's undifferentiated effects to restricting only the "wood supply." RTC Doc. at 19.

[21] MDEQ cites federal government reports to sustain its claim of severe weather in northern Michigan. MDEQ Resp. at 13 n.49 (citing National Climatic Data Center website for storm events). Without deciding whether this extra-record information is properly before us, we note that, in any event, even enhanced data about local weather conditions would not, without more, bear on the relative availability of particular fuels.

Third, the record tells merely of wood provided by unidentified "independent suppliers." Permit Appl. § 2.1, at 3; Permit Eval. Form at 4. Whether these suppliers are nearer or more distant than Marquette or Presque Isle, and thus more or less likely to suffer delivery disruptions due to poor weather, the record does not say. In the absence of this information, the true effects of inclement weather on wood deliveries cannot be known.

(2) *Storage Restrictions*

While MDEQ makes claims that storage room for combined wood and coal supplies is limited to three days,[22] substantiating documentation is missing. MDEQ identifies no particular physical, structural, or other impediment to back its assertions. The record's single pointer allowing any independent judgment as to storage limitations is the site diagram showing a facility of apparently spacious storage capacity. *See* Permit Appl. app. A (detailed Ripley Heating Plant diagram). It outlines wood silos with no visible spacial restraints inhibiting larger or additional silos.[23] It demarcates a "wood handling building" and "wood hopper" of dimensions comparable to the wood silo, both clearly suggesting additional on-site capacity for greater supplies of wood. *See id*. Expanses of seemingly empty "lot" space (denominated as Lots #19 and #22) and an unlabeled area ringing much of the coal containment area – all many times the size of the outlined wood silo – also call into question why such large tracts are unavailable for wood storage. *See id*. Nor does the diagram account for the storage possibilities of substantial other areas of apparently empty space interspersed throughout the facility. Given that purported storage limitations are central to the BACT analysis in this case, one reasonably should expect a robust presentation of evidence in the record to establish limited space as a fact.[24]

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[22] We take MDEQ's frequent finding of only three days' storage, e.g., Fact Sheet at 2; RTC Doc. at 20, 24, at its logical word – storage of combined wood and coal supplies, not separate three-day supplies for each. At oral argument, however, MDEQ stated that NMU will have three days' storage space for each fuel. OA Tr. at 44-45; *see also* MDEQ Resp. at 2 ("[w]ood and coal will be stored in silos that have the capacity to store up to a three-day supply of each fuel"). We defer to the record, not counsel's representations. *E.g., In re Wash. Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 589 (EAB 2004) (a permit issuer "cannot through its arguments on appeal augment the record upon which the permit decision was based").

[23] We recognize that MDEQ, accommodating community concerns about possible odors from stored, wet wood, barred stockpiling wood outside fuel silos. Permit spec. cond. 3.2, at 11; *see* RTC Doc. at 4. To sensibly confine fuel storage to silos, however, does not address or explain MDEQ's sanctioning of NMU's failure to propose construction of additional storage silos on a site the University's own diagram appears to show fully capable of handling more.

[24] At oral argument, MDEQ instead suggested that NMU intended its diagram to show only the details of the Ripley Heating Plant, and not what structures or uses might be present on or intended for the seemingly capacious empty spaces surrounding the plant. OA Tr. at 47.

(b) *Exclusive Use of Marquette and Presque Isle Coal*

Had it come after "careful and detailed" consideration, *In re Cardinal FG Co.*, 12 E.A.D. 153, 162 (EAB 2005), or been attentive to "[appropriate] technology or methods," *In re Prairie State Generating Co.*, 13 E.A.D. 1,12 (EAB 2006), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007), MDEQ's unqualified declaration that "[c]oal will be obtained" from Marquette or Presque Isle might have withstood scrutiny.[25] *See* Permit Eval. Form at 4. But all indications are otherwise, suggesting a fixed, preselected outcome, or at least one never subjected to serious examination.[26]

First, the four corners of the record itself, including the facility diagram noted above, belie claims of no storage space for coal other than Marquette or Presque Isle coal. Second, even were storage space limited to three days' supply, shutting out any coal but Marquette or Presque Isle coal raises an obvious question to which the record gives no answer: why even a storage-limited site is incapable of accommodating non-Marquette or non-Presque Isle coal. Third, taking MDEQ at its word of severe weather disruptions to "any" fuel supply, the argument that Marquette and Presque Isle coal deliveries will somehow – and unique among all other coals or wood – prevail over such weather, and resoundingly enough to write their use into the permit twenty-two days per month, year round, is unsustainable.

The record is silent as to why other coal sources, whether more distant or more proximate, were not considered. This gap is particularly troubling on a record that spotlights at least two coal-fired, lower sulfur-polluting facilities, both employing low sulfur coal or other low sulfur emission technological features apparently achievable but inexplicably rejected for the NMU facility.[27] *See* Permit

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[25] NMU itself acknowledged single-focus coal procurement: "MDEQ correctly [considered] * * * *the* [Marquette and Presque Isle] coal * * * that would be available to NMU when biomass is unavailable." NMU Resp. at 23 (emphasis added).

[26] MDEQ provides some indication why it holds so persistently to these two coal sources alone. The Department claims the 1.5% sulfur content of the higher sulfur coal is "legally allowed," as if to suggest that use of "legal" fuel ends the permit authority's BACT obligations to seek the cleanest fuel available. *See* MDEQ Resp. at 16 (explaining that coal used at Presque Isle is allowed by permit to contain a maximum of 1.5% sulfur by weight) (citing RTC Doc. at 20).

[27] If MDEQ implicitly argues that severe weather disruptions to fuel deliveries necessitate exclusive use of Marquette or Presque Isle coal because both sources are nearby and presumably more likely to prevail during poor weather, *see, e.g.*, RTC Doc. at 19, it does so unsuccessfully. Proximity alone is insufficient on a record devoid of attempts to identify other technically feasible sources as proximate as, or more proximate than, Marquette or Presque Isle. NMU offers Marquette and Presque Isle proximity as conferring a coal storage advantage (i.e., space limitations necessitate "just in time"

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Eval. Form at 3 (considering 24-hour average SO_2 BACT limits of 0.05 lb/MMBtu for 270-megawatt plant and 0.103 lb/MMBtu for 44-megawatt plant).

One ambiguous sentence in the record, embellished slightly in MDEQ's brief, attempts a justification. "A different plan would redefine the source as proposed," says the Department. RTC Doc. at 19; *see* MDEQ Resp. at 15. Yet, at best, this "plan" is opaque. The preceding sentence speaks in one breath of a broad "choice" of fuels and in another of MDEQ's decision to choose only Marquette and Presque Isle coal. RTC Doc. at 19; *see* Fact Sheet at 2; Permit Eval. Form at 4. At worst, MDEQ's assertion that a different coal source constitutes impermissible "redefining" is unpersuasive and not supported by the record.

MDEQ's brief also notes the difficulty of arranging transport of non-local lower sulfur coal to the Ripley Heating Plant. MDEQ Resp. at 15. Such shipments, necessitating that NMU "receive," "stockpile," and "feed" the non-local coal into the boiler, would require "changes in design of the facility," thus "impermissibly redefining the source." *Id*. The brief is not part of the administrative record for this permit, and thus we give its factual representations no weight. *See* 40 C.F.R. § 124.18(c) (administrative record for EPA-issued permit is considered complete on date final permit is issued). We do, however, address the legal argument it raises.

c. *Redefining the Source*

"Historically, EPA has not considered the BACT requirement as a means to redefine the design of the source when considering available control alternatives." NSR Manual at B.13. Board and Administrator decisions adhere firmly to this principle. *See, e.g., Prairie State*, 13 E.A.D. at 20-28; *In re Hillman Power Co.*, 10 E.A.D. 673, 691-92 (EAB 2002); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 135-44 (EAB 1999); *In re SEI Birchwood, Inc.*, 5 E.A.D. 25, 29-30 n.8 (EAB 1994); *In re Haw. Commercial & Sugar Co.*, 4 E.A.D. 95, 99-100 (EAB 1992); *In re Old Dominion Elec. Coop.*, 3 E.A.D. 779, 793 n.38 (Adm'r 1992); *In re Hibbing Taconite Co.*, 2 E.A.D. 838, 843 & n.12 (Adm'r 1989).

As more finely rendered by the Board, "certain [design] aspects" of the proposed facility are beyond the reach of BACT; "other [design] aspects" are within it. *Prairie State*, 13 E.A.D. at 20. To guide it, the Board gives central importance to "how the permit applicant defines the proposed facility's purpose or basic de-

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(continued)
deliveries from nearby coal sources, NMU Resp. at 23), but again, no record support either for this statement or the basis behind it is offered.

sign," *id*. at 28,[28] but puts the applicant's case to a "hard look." *Id*. at 34-35, 13 E.A.D. at 26; *e.g.*, *Knauf*, 8 E.A.D. at 135-44.

Accordingly, the Board takes care to identify "inherent" design elements, *Prairie State*, 13 E.A.D. at 22, part of the "fundamental purpose" of the proposed facility, *id*. 13 E.A.D. at 25 n.25, or a design such that change to it would "call into question [the facility's] existence." *See id*. 13 E.A.D. at 24. This test shields from BACT review fuel choices found "integral" to the basic design. Proposed coal-fired electrical generators need not consider a natural gas turbine, for example. *See id*. (citing *SEI Birchwood*, 5 E.A.D. at 29-30 n.8; *Haw. Commercial*, 4 E.A.D. at 99-100; *Old Dominion*, 3 E.A.D. at 793; NSR Manual at B.13).

On the other hand, the CAA promotes "clean fuels" with particular vigor. *See* CAA § 169(3), 42 U.S.C. § 7479(3). Merely equating use of lower polluting fuels to impermissible redesign in the hope of paving an automatic BACT off-ramp pointedly frustrates congressional will. The United States Court of Appeals for the Seventh Circuit is notably dismissive of such strategies. Clean fuels may not be "read out" of the Act merely because their use requires "some adjustment" to the proposed technology. *Sierra Club v. EPA*, 499 F.3d 653, 656 (7th Cir. 2007). If the only required adjustment were that a dirtier fuel be "switched" to a cleaner fuel, said the court in an illustration of near perfect aptness to NMU's CFB boiler, then low sulfur coal should be the BACT choice over high sulfur coal. *Id*.

Too late and on too meager a record, MDEQ attempts to inject the specter of major redesign. Its brief pushes forward entirely new theories – "transport" difficulties, "stockpile * * * and [boiler] feed" problems – that it claims amount to redesign or "redefining the source" were non-Marquette or -Presque Isle coal forced upon it.[29] MDEQ Resp. at 15. But the record before us does not sustain such claims. The documentary trail offers no basis to conclude that any fundamental design change, or any source or facility design change whatsoever, would result were NMU, like the facility posited in *Sierra*, to burn lower sulfur non-Marquette or -Presque Isle coal. No data show the CFB boiler incapable of burning coal from other sources. Indeed, that its design allows burning of "bituminous and subbituminous Powder River Basin * * * coals," Permit Appl. § 2.1, at 3, suggests so broad a coal range as to be nearly dispositive evidence to the

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[28] Deference to applicant characterization is not unbridled. A design motivated by cost savings, avoidance of risks inherent in new or innovative technologies, or other considerations unrelated to basic design elements will not escape BACT review. *E.g.*, *Prairie State*, 13 E.A.D. at 22 n.21.

[29] NMU adds parallel facility design concerns – e.g., infeasibility, harm to the "business plan" – also without reference to any sustaining basis in the record. *See* NMU Resp. at 23-24.

contrary.[30] No facility diagram or other reason tells why storage space designated exclusively for Marquette and Presque Isle coal cannot make way for non-Marquette or -Presque Isle coal, or why storage areas for additional non-Marquette and -Presque Isle coal is not feasible. Nor does MDEQ put before us any documentation that delivery of non-Marquette or -Presque Isle coal would work some harm, or force some change, to the basic facility design.

d. *Conclusion*

If the NSR Manual is the broad, oft-traveled thoroughfare to determining BACT, MDEQ has almost categorically declined to follow it – or any method consistently faithful to statutory and regulatory guidelines. MDEQ's SO_2 BACT analysis locks onto a combination of minimal wood burning and predominant use of Marquette or Presque Isle coal, yet offers few connecting threads of logic or data to sustain these fuel choices, justify them as enabling NMU to achieve emissions limitations clean enough to be BACT, or support the redefining-the-source claim. The Department's decision lacks a coherent, "clearly ascertainable basis," *Knauf*, 8 E.A.D. at 134, or "careful and detailed" look, *In re Cardinal FG Co.*, 12 E.A.D. 153, 162 (EAB 2005), and we are unable to conclude that it "meets the requirement of rationality." *In re Gov't of D.C. Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 343 (2002). Therefore, under part 124, we remand the permit to MDEQ for reconsideration of the BACT limitations chosen for SO_2 emissions from the CFB boiler.

4. *Pollutants with No BACT Controls*

a. *BACT Analysis for $PM_{2.5}$ Emissions from the CFB Boiler*

In comments on the draft permit and in its opening brief, Sierra Club notes the PSD program's requirement of BACT limits for "each pollutant subject to regulation." SC Cmts. at 7 (citing CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j)(2)); Pet'n at 8 (citing 40 C.F.R. § 52.21(j)(2)). Sierra Club observes that $PM_{2.5}$ is a "pollutant subject to regulation under the Act" because EPA established NAAQS for that specific air contaminant in July 1997. Pet'n at 8 (citing National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652 (July 18, 1997) (codified as amended at, *inter alia*, 40 C.F.R. § 50.7)). Sierra Club then contends that MDEQ erred in issuing NMU's permit because it substituted a PM_{10} BACT analysis for the requisite $PM_{2.5}$ BACT analy-

[30] "Bituminous" or "soft" coals are the largest group of coals and have lower fixed carbon and higher volatile matter than anthracite (i.e., hard coal). Office of Air Quality, Planning & Standards, U.S. EPA, I *Compilation of Air Pollutant Emission Factors AP-42: Stationary Point and Area Sources* ch. 1.1, at 1.1-1 (Sept. 1998). "Subbituminous" coals "have higher moisture and volatile matter and lower sulfur content than bituminous coals and may be used as an alternative fuel in some boilers originally designed to burn bituminous coals." *Id.*

sis, pursuant to the Agency's so-called "surrogate" policy.[31] SC Cmts. at 6-8; Pet'n at 8-11.

EPA released the surrogate policy in October 1997, just a few months after it promulgated the $PM_{2.5}$ NAAQS. *See* MDEQ Resp. Ex. 5 (Memorandum from John S. Seitz, Director, Office of Air Quality Planning & Standards, U.S. EPA, to Regional Air Directors, *Interim Implementation of New Source Review Requirements for* $PM_{2.5}$ (Oct. 23, 1997)) ("Seitz Policy"). In so doing, EPA noted "significant technical difficulties" attending full implementation of PSD requirements for $PM_{2.5}$, largely resulting from a lack of adequate tools for calculating $PM_{2.5}$ emissions, and authorized interim use of PM_{10} as a "surrogate" for $PM_{2.5}$ in meeting the PSD requirements. *Id*. at 1-2. EPA later reaffirmed the Seitz Policy in April 2005, noting that the Agency had not yet promulgated an implementation rule for $PM_{2.5}$ and thus administration of PSD requirements for $PM_{2.5}$ emissions remained "impractical." *Id*. Ex. 6, at 4 (Memorandum from Stephen D. Page, Director, Office of Air Quality Planning & Standards, U.S. EPA, to Regional Offices, *Implementation of New Source Review Requirements in PM-2.5 Nonattainment Areas* 4 (Apr. 5, 2005)).

On May 12, 2008, the date MDEQ issued NMU's PSD permit, and all throughout the preceding development period for this permit, the $PM_{10}/PM_{2.5}$ surrogate policy represented the Agency's recommended approach for regulating $PM_{2.5}$ emissions. MDEQ indisputably relied on that policy in developing NMU's BACT limits for $PM_{2.5}$. Permit spec. conds. 1.1bb, 1.1cc & n.*; *see* RTC Doc. at 18.

On appeal, Sierra Club attempts to establish clear error in MDEQ's reliance on this approach by asserting that "no provision nor legal basis in the regulations" allows for such an approach, Pet'n at 9, and by claiming that substitution of PM_{10} limits for $PM_{2.5}$ limits is "arbitrary" in light of the differing health impacts of $PM_{2.5}/PM_{10}$.[32] *Id*. at 10-11. These arguments essentially repeat contentions Sierra Club made in comments on the draft permit. *See* SC Cmts. at 6-8. The Department responded to these arguments by referencing the "administrative impracticab[ilities]" – i.e., lack of measurable standards and calculation tools – EPA cites

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[31] Notably, Sierra Club does not challenge the adequacy of the PM_{10} analysis, only the use of PM_{10} as a surrogate for $PM_{2.5}$.

[32] Sierra Club also makes arguments relating to a final $PM_{2.5}$ implementation rule EPA issued on May 16, 2008, just four days after MDEQ issued NMU's permit. Pet'n at 9-10; Reply to MDEQ at 2-3; Reply to NMU at 5; *see* Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$), 73 Fed. Reg. 28,321 (May 16, 2008) (to be codified in scattered sections of 40 C.F.R. pts. 51-52). In light of Sierra Club's dismissal of these arguments as irrelevant to the permit at issue in this case, *see* Reply to MDEQ at 3 & n.1; OA Tr. at 22-23, we do not address them.

as justification for the surrogate policy, and also presented some comparative information on $PM_{2.5}$ limits at other facilities. RTC Doc. at 18.

We hold on this record that MDEQ properly relied on the surrogate policy to evaluate BACT requirements for the CFB boiler's emissions of $PM_{2.5}$. Sierra Club failed to make any showing of clear error, abuse of discretion, or other grounds for a grant of review of the Department's permit decisions pertaining to $PM_{2.5}$. *See* 40 C.F.R. § 124.19(a). Accordingly, we deny review on this basis.

b. *BACT Analyses for CO_2 and N_2O Emissions from the CFB Boiler*

Lastly, Sierra Club argues that MDEQ erred by declining to conduct BACT analyses for carbon dioxide ("CO_2") and nitrous oxide ("N_2O") emissions from the CFB boiler. Pet'n at 11-18; Reply to MDEQ at 4-11; Reply to NMU at 6-20. In brief, Sierra Club claims that these two pollutants are "subject to regulation" under the CAA and thus BACT limits must be developed for them. In Sierra Club's view, CO_2 is regulated under the Act because section 821 of Public Law 101-549, enacted in 1990, provides for monitoring and reporting of CO_2 emissions from certain stationary sources. Sierra Club's arguments in this regard closely and substantially track those made in *In re Deseret Power Electric Cooperative*, a case recently the subject of detailed analysis and remand by this Board. *See generally In re Deseret Power Elec. Coop.*, 14 E.A.D. 212 (EAB 2008). For the reasons set forth in that decision, we similarly remand the CO_2 issue here, directing MDEQ, guided by our findings in *Deseret*, to undertake the same consideration whether the CAA's "pollutant subject to regulation" language requires application of a BACT limit to CO_2 emissions.

In addition, with respect to the questions whether approval by EPA of CO_2- or N_2O-related provisions in several state implementation plans ("SIPs") constitutes CO_2 or N_2O regulation under the Act, we instruct the Department to fully consider these issues on remand, its response to comments having failed to do so. *See* RTC Doc. at 8, 18-19, 29-30. Lastly, Sierra Club contends for the first time that CO_2 is one of the constituents of municipal solid waste landfill emissions (subject to CAA § 111 and implementing regulations) and therefore is regulated under the Act. As this argument was not presented to MDEQ during the public comment period, it is not preserved for consideration in this appeal. *In re ConocoPhillips Co.*, 13 E.A.D. 768, 800-05 (EAB 2008); *In re Christian County Generation, LLC*, 13 E.A.D. 449, 457-63. However, since the remand requires a fresh analysis of whether CO_2 and N_2O are "subject to regulation," the Department should consider in the remand proceeding this or any other issue pertaining to possible BACT limits for CO_2 and N_2O emissions from NMU's boiler.

B. *Air Quality Issues*

We turn our attention next to a second focal point of the PSD program: *air quality*. In section 165 of the Clean Air Act, Congress directs owners and operators of proposed major emitting facilities to demonstrate that emissions from the construction or operation of their facilities "will not cause, or contribute to, air pollution in excess of any (A) maximum allowable increase or maximum allowable concentration for any pollutant in any area to which this part applies more than one time per year, (B) national ambient air quality standard in any air quality control region, or (C) any other applicable emission standard or standard of performance under this chapter." CAA § 165(a)(3), 42 U.S.C. § 7475(a)(3). EPA's regulations implement this provision by requiring, among other things, that each applicant for a PSD permit conduct a "source impact analysis," as follows:

> The owner or operator of the proposed source or modification shall demonstrate that allowable emission increases from the proposed source or modification, in conjunction with all other applicable emissions increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of:
>
> > (1) Any national ambient air quality standard in any air quality control region; or
> >
> > (2) Any applicable maximum allowable increase over the baseline concentration in any area.

40 C.F.R. § 52.21(k).

The national ambient air quality standards, or NAAQS, referenced in the first prong of the source impacts analysis are (as noted in Part I.A above) maximum ambient air concentrations for specific pollutants that EPA has determined are necessary to protect public health and welfare. *See* CAA §§ 108(a)(1)(A), 109, 42 U.S.C. §§ 7408(a)(1)(A), 7409; 40 C.F.R. §§ 50.4-.12. The maximum allowable increase over a baseline referenced in the second prong of the analysis is called a "PSD increment" or "air quality increment." EPA designates increments as amounts of specific pollutants that can be added to the ambient air over certain baseline concentrations of those pollutants without causing significant deterioration of air quality from the baseline levels. *See* CAA § 165(a)(3)(A), 42 U.S.C. § 7475(a)(3)(A); 40 C.F.R. § 52.21(c). The smallest increments are available (thus allowing for the smallest degree of air quality deterioration) in "Class I" areas, which consist of national parks and wilderness areas. Larger increments are available in "Class II" areas, which are areas in which "normal well-managed industrial growth" is anticipated, and the largest increments are available in "Class III" areas,

which are designated for more intensive development.[33] *See* CAA §§ 162, 163(b)(1), 42 U.S.C. §§ 7472, 7473(b)(1); 40 C.F.R. § 52.21(c); NSR Manual at C.4-.5.

A permit applicant establishes compliance with the NAAQS and PSD increment elements of the source impact analysis through the vehicle of an "ambient air quality analysis," which applicants must prepare under the permitting rules for each regulated pollutant their proposed facilities will emit in "significant" amounts.[34] 40 C.F.R. § 52.21(b)(23)(i), (m)(1)(i). This analysis predicts a pollutant's future concentration in the ambient air by modeling a proposed facility's expected emissions of the pollutant against the backdrop of existing ambient conditions. To conduct an air quality analysis, a permit applicant compiles data on the proposed facility's physical specifications and anticipated emission rates, local topography, existing ambient air quality, meteorology, and related factors. *See*, *e.g.*, 40 C.F.R. § 52.21(*l*), (m); *id*. pt. 51 app. W (Guideline on Air Quality Models); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 145-48 (EAB 1999); NSR Manual at C.16-.23, .31-.50. These data are then processed using mathematical models that calculate the rates at which pollutants are likely to disperse into the atmosphere under various climatological conditions, with the goals of determining whether emissions from the proposed source will cause or contribute to a violation of either the NAAQS or the PSD increments. *See* 40 C.F.R. § 52.21(*l*); *id*. pt. 51 app. W; NSR Manual at C.24-.27, .51-.70.

As a general matter, an air quality analysis will unfold in two phases. First, the permit applicant will conduct a "preliminary analysis" using dispersion modeling to evaluate whether emissions of the pollutant from the proposed facility will – by themselves, without consideration of existing ambient air quality – exceed certain "significant ambient impact levels," or "SILs."[35] *See* NSR Manual at C.24

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[33] Congress expressly designated all international parks, national wilderness areas/memorial parks over 5,000 acres in size, and national parks over 6,000 acres in size as Class I areas. CAA § 162(a), 42 U.S.C. § 7472(a). Congress also initially designated all other areas falling within state-determined attainment and unclassifiable areas as Class II areas. CAA § 162(b), 42 U.S.C. § 7472(b). These latter areas may be redesignated as Class I or Class III upon state or tribal proposal and EPA approval as a revision to the applicable state implementation plan. 40 C.F.R. § 52.21(g).

[34] More precisely, each applicant for a proposed major stationary source that has the potential to emit any regulated pollutant in a "significant" amount, or for a proposed major modification that will result in a "significant net emissions increase" of any regulated pollutant, must include in the permit application an ambient air quality analysis for each such pollutant. 40 C.F.R. § 52.21(m)(1)(i). The emissions rates deemed "significant" for these purposes are rates equal to or in excess of the following: for CO, 100 tpy; for NO_x or SO_2, 40 tpy; and for PM_{10}, 15 tpy. *Id.* § 52.21(b)(23)(i) (listing significant rates for these and other pollutants).

[35] As we observed in *Knauf*, the SILs are "just one set of several standards in the PSD program that make use of the word 'significant.' These levels are not to be confused with the significance levels

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& tbl. C-4, at C.28 (listing SILs recommended for use in Class II areas). If the new emissions do not exceed these levels, the proposed facility will have successfully demonstrated compliance with the NAAQS and PSD increments. *See In re Prairie State Generating Co.*, 13 E.A.D. 1, 103-08 (EAB 2006) (citing Agency guidance on use of SILs), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007); *In re AES Puerto Rico, LP*, 8 E.A.D. 324, 331, 343-44 (EAB 1999), *aff'd sub nom. Sur Contra La Contaminacion v. EPA*, 202 F.3d 443 (1st Cir. 2000). If the new emissions do exceed these levels, then a second phase, called a "full impact analysis," will typically be conducted. In this second phase, the permit applicant will use dispersion models to estimate the ambient concentrations that will result from its proposed emissions in combination with emissions from existing sources. NSR Manual at C.24-.53; *see* Air Quality Division, MDEQ, *Air Dispersion Modeling Guidance Document* § 1.0, at 1 (June 2008). These figures will then be used to determine whether the proposed facility causes or contributes to a violation of the NAAQS and PSD increments. *See*, *e.g.*, *AES Puerto Rico*, 8 E.A.D. at 345-47; *Knauf*, 8 E.A.D. at 148-54.

In the present case, NMU's proposed installation of a new CFB boiler at the Ripley Heating Plant is considered a "major modification" that will result in a significant net increase in emissions of SO_2, PM_{10}, CO, and NO_x from the facility, as noted in Part I.B above. Accordingly, the ambient air quality analysis requirements apply with respect to each of these four pollutants. However, upon conducting preliminary air quality analyses, NMU determined that the proposed boiler will emit only one pollutant, SO_2, at levels in excess of the SILs. Permit Appl. §§ 6.0, 6.5, at 51-52, 69-76. Thus, the University conducted a full impact air quality analysis solely for that pollutant. *See id*. §§ 6.5.2-.3, at 71-74. MDEQ reviewed and approved NMU's air quality modeling and conclusions regarding the boiler's impact on the NAAQS and PSD increments. *See* Fact Sheet at 2-3; MDEQ Resp. Ex. 9 (MDEQ, *Air Dispersion Analysis Summary, NMU – Ripley Heating Plant* (May 8, 2007)) ("Air Analysis Summary").

On appeal, Sierra Club challenges four aspects of the air quality analysis performed for the CFB boiler and approved by MDEQ, claiming as follows: (1) the Department's attempt to account for PSD increment-consuming emissions from the nearby Presque Isle Power Plant is erroneous as a matter of law; (2) the Department failed to account for worst-case emissions in the air quality modeling used to establish compliance with NAAQS and PSD increment standards; (3) the Department failed to require that NMU conduct site-specific preconstruction monitoring mandated by the CAA; and (4) the Department employed improper

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(continued)
that govern PSD review generally." 8 E.A.D. at 149 n.40; *cf*. 40 C.F.R. § 52.21(b)(23)(i) (listing of the latter significance levels).

standards in excusing NMU from conducting PSD increment analyses for Class I-designated areas. We address each of these issues in turn below.

1. *Consumption/Expansion of PSD Increment*

a. *Legal Background*

As noted above, PSD increments are designed to "prevent significant deterioration" of air quality in locations that already have relatively clean air by ensuring that contaminants projected to be contributed by proposed new or modified sources, combined with levels of contamination already present in the ambient air as of a specific baseline date, will fall within bounds established by the Agency. To date, EPA has established PSD increments for just three pollutants – SO_2, PM_{10}, and NO_2. The increments consist of numeric concentrations, measured in micrograms of pollutant per cubic meter of air, that vary according to averaging period (3-hour, 24-hour, or annual averages) and geographic location (Class I, II, or III). *See* 40 C.F.R. § 52.21(c) (table of increment levels).

As PSD permits are issued over the course of time, newly authorized emissions are said to "consume" a portion of the PSD increment available in a given area, thus "shrinking" or reducing the remaining amount of increment available for new development.[36] *In re W. Suburban Recycling & Energy Ctr., LP*, 8 E.A.D. 192, 195 (EAB 1999); *see* 72 Fed. Reg. 31,372, 31,376-77 (June 6, 2007); 45 Fed. Reg. 52,676, 52,717-20 (Aug. 7, 1980); 43 Fed. Reg. 26,388, 26,400-02 (June 19, 1978). Conversely, as sources reduce their emissions or close down completely, pollutant levels that previously existed are eliminated, thus "freeing up" portions of increment – i.e., "expanding" the increment – and making it available again for new development. 72 Fed. Reg. at 31,376-77; 45 Fed. Reg. at 52,717-20; 43 Fed. Reg. at 26,400-02; NSR Manual at C.10-.11. In the State of Michigan, MDEQ policy specifies that no single facility may consume more than 80% of applicable Class II increment standards, in order to allow for future industrial growth. *E.g.*, Air Quality Division, MDEQ, *Air Dispersion Modeling Guidance Document* § 1.0, at 1 (June 2008); *see* Permit Appl. § 6.0, at 51.

b. *Procedural Background*

In its petition, Sierra Club argues that MDEQ's attempt to account for increment-consuming emissions from the nearby Presque Isle Power Plant is erroneous as a matter of law. Pet'n at 39. By way of background, Sierra Club explains that in the original source impact analysis prepared by NMU for its permit application, the University had assumed emissions from all existing stationary sources in the

[36] The *amount* of increment consumed by a source that has undergone a major modification is at issue in this appeal and is addressed in the following analysis.

vicinity of the new powerhouse – including Presque Isle – were included in the baseline concentration and thus did not consume any increment. *Id*. at 40 (citing Permit Appl. § 6.5.2, at 71). In preparing that analysis, NMU had actively sought MDEQ's input to ensure evaluation of a complete inventory of emissions sources, but neither the Department nor NMU identified Presque Isle as an increment-consuming source. *See* Permit Appl. §§ 6.4, 6.5.2, at 67, 71. In comments on the draft permit, however, Sierra Club pointed out that Presque Isle had undergone construction through one or more major modifications since the date designated as the "major source baseline" for SO_2 (i.e., January 6, 1975), and emissions attributable to those modifications could not, by virtue of their timing, possibly be reflected in the baseline concentration. It took the position that it was improper to exclude not only post-January 6, 1975 emissions, but that *all* of Presque Isle's emissions (whether pre- or post-January 6, 1975) should have been modeled as consuming some portion of the PSD increment available in the ambient area near NMU's campus. SC Cmts. at 44-54 (cited in Pet'n at 40).

In its response to comments, MDEQ did not acknowledge any error in its review and approval of NMU's original PSD increment analysis. Instead, the Department simply changed course, treating Presque Isle as an increment-consuming source for purposes of calculating that facility's effect on the air quality modeling. MDEQ explained its revised analysis as follows:

> The SO_2 major source baseline date was set by the [CAA] to be January 6, 1975. Emissions associated with modification at a major stationary source consume increment after this date. A comparison was made between the reported SO_2 emissions from Presque Isle for 1973 and 2006 which were found to be 15,274 tpy and 16,609 tpy respectively. This increase of 1335 tpy should not be part of the baseline and should be considered in the PSD increment analysis. New modeling was conducted by [MDEQ] which added the 1335 tpy to the increment analysis and the results indicated that this change had no effect on either the 3-hr or 24-hr PSD maximum (100%) SO_2 PSD increment levels. However, the addition of the 1335 tpy did cause the annual PSD increment concentration to increase to approximately 10 percent which is still well below the State's 80% allowable Class II PSD increment criterion.

RTC Doc. at 14.

c. *Arguments on Appeal*

On appeal, Sierra Club asserts that "[t]here is no legal basis for the 1,355 tons used" by MDEQ in its revised analysis, Pet'n at 41, and continues to claim that the Department should have used all of Presque Isle's "actual emissions" to calculate increment consumption. As authority for its proposition, Sierra Club points to the PSD regulations, which specify, in its view, that all "actual emissions" from new and modified major stationary sources constructed after the major source baseline date should be excluded from the baseline concentration and instead analyzed as consuming part of the PSD increment. *Id*. (citing 40 C.F.R. § 52.21(b)(13)(ii)(a)). Sierra Club notes that "actual emissions" are defined as "'the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation.'" *Id*. (quoting 40 C.F.R. § 52.21(b)(21)(ii)). Alternatively, a source's "actual emissions" can be presumed to be its "allowable emissions." *Id*. (referring to 40 C.F.R. § 52.21(b)(21)(iii)).

Employing these definitions, and drawing on Presque Isle emissions data taken from EPA's Acid Rain Database, Sierra Club concludes that "[a]t a minimum, the 'actual emissions' from [Presque Isle] would be the average rate during the representative two years preceding the date of permit issuance for the NMU plant; while MDEQ did not calculate this amount, it is approximately between 14,235 and 16,690 tons of SO_2." Reply to MDEQ at 21 n.9 (citing Pet'n at 42 & n.6, which provides the Acid Rain Database reference as www.epa.gov/airmarkets). Sierra Club criticizes MDEQ for choosing Presque Isle emissions data from two "random" years, 1973 and 2006, calculating the difference between the two emissions rates, and thereby deriving a figure for use in the increment-consumption analysis that, in its view, is ten times lower than it should be. *Id*. at 22; Pet'n at 42; OA Tr. at 27-28.

d. *Analysis*

Upon review of the briefs, we find that the parties generally do not disagree on what law applies to this issue. Indeed, each side quotes portions from the same regulatory and statutory provisions, albeit for differing purposes. *Compare* Pet'n at 39-42, Reply to MDEQ at 21-22, *and* Reply to NMU at 26-30, *with* MDEQ Resp. at 19-20, *and* NMU Resp. at 24-25. Their disagreement lies in how these provisions should be interpreted, which leads to a dispute over the method that should be used to determine how much increment a modified source consumes (or relinquishes) as a result of the modification. MDEQ and NMU cite the statute, regulations, and long-standing Agency guidance to support their view that any post-baseline *change* in a facility's emissions (be it upward or downward) resulting from a major modification must be factored into the increments analysis. *See* MDEQ Resp. at 19-20; NMU Resp. at 24-25. Thus, only the emissions impact of the change consumes (or relinquishes) increment. Sierra Club urges a contrary

interpretation based on the "plain language" of the relevant authorities, suggesting that *all* emissions from a source that has undergone a major modification since the baseline date must be treated as increment-consuming, not just the emissions associated with the change. *See* Reply to MDEQ at 21-22; Reply to NMU at 26-30; OA Tr. at 27, 109-10.

i. *Congressional Intent*

To resolve these competing interpretations, we look first to the statute and legislative history to see what those sources might tell. We learn, at the outset, that Congress largely left to EPA the task of defining the methods by which PSD increments are deemed consumed or expanded. *See* CAA § 165(e)(1), (3), 42 U.S.C. § 7475(e)(1), (3) (directing EPA to promulgate regulations implementing PSD program); *see also* 72 Fed. Reg. at 31,379 (the CAA "provide[s] no guidance on increment consumption calculations"); 45 Fed. Reg. at 52,718 (same). Congress did, however, define several parameters for the "baseline concentration" of pollutants, which are relevant to the increments analysis. *See* 45 Fed. Reg. at 52,718 ("Increment consumption or expansion is directly related to baseline concentration. Any emissions not included in the baseline are counted against the increment.").

Under Congress' definition, the "baseline concentration" of a pollutant in a particular area is the concentration present in the ambient air at the time the first PSD permit application affecting that area is submitted. CAA § 169(4), 42 U.S.C. § 7479(4); *Ala. Power Co. v. Costle*, 636 F.2d 323, 374 (D.C. Cir. 1979). This concentration must *include* emissions from major emitting facilities upon which construction commenced prior to January 6, 1975 (even those not yet operational by the date of the first PSD application), and *exclude* emissions from major emitting facilities that commence construction after January 6, 1975. CAA § 169(4), 42 U.S.C. § 7479(4); S. Rep. No. 95-127, at 97-98 (1977), *reprinted in* 3 A Legislative History of the Clean Air Act Amendments of 1977, at 1471-72 (1978). Emissions from the latter (excluded) category of sources must, under Congress' definition, instead "be counted against the maximum allowable increases in pollutant concentrations established under this part" – i.e., against the PSD increments. CAA § 169(4), 42 U.S.C. § 7479(4); *Ala. Power*, 636 F.2d at 376-77.

Industry expressed concern that the latter portion of Congress' definition could adversely affect future development if it were interpreted to deny the idea of a "negative increment" (i.e., the increment expansion concept). Industry explained:

> After defining the baseline to be the ambient concentrations of [pollutants] in existence at the time the first applicant for a nondeterioration permit is filed, this section goes on to state that * * * [pollutants] emitted from any

> major emitting facility on which construction is commenced after January 6, 1975, will not be included in the baseline, but must be subtracted from the available increment. Thus even when an existing unit is shut down, creating an emission reduction below baseline, its replacement unit is classed as a new source and therefore must be subtracted from the available increment as if it were above the baseline. Since the increment is a non-renewable value which, once exhausted, ends future growth, it is foreseeable that in the long run every existing major emitting facility in nondeterioration areas will be forced to cease operations. This could occur because worn-out boilers and other sources vital to operation would not be able to be replaced by new boilers once the increment has been used up – even though the ambient air quality may be better than it was during the baseline year, and even though the replacement boiler would probably emit less than the existing boiler.
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> Surely no one intended this absurd result – yet a careful reading of the language in either version of [the proposed legislation] inescapably leads to this anomalous result. It is clear that the language provides a disincentive to modernize older inefficient sources. Since owners would be given no credit for cleanup, they would be forced to go to boundless effort to keep such sources operational in order to avoid using up any of that precious allowance for expansion in the area.

Clean Air Act Amendments of 1977: Hearing Before the Subcomm. on Environmental Pollution of the S. Comm. on Environment & Public Works, 95th Cong. 520 (1977), *reprinted in* 5 A Legislative History of the Clean Air Act Amendments of 1977, at 4170 (1978) (statement of Roger H. Watts, Assistant General Counsel, ITT Rayonier, Inc., for American Paper Institute and National Forest Products Association); *accord Clean Air Act Amendments of 1977: Hearings Before the Subcomm. on Health & the Environment of the H. Comm. on Interstate & Foreign Commerce*, 95th Cong. 1258 (1977) (similar statement of Roger H. Watts) ("We have raised this point with the Senate Committee on Environment and Public Works, where the provision originated, and have been informally advised that the staff will make the necessary adjustments. We call it to your attention in case the alteration is overlooked, because of the potentially serious impacts from this deceptively innocuous-sounding sentence.").

Congress did not alter the statutory language in response to industry's pleas, but it also left unchanged the language that assigns to the baseline the pollutant

levels emitted by pre-January 6, 1975 facilities. *Compare* S. 3219, 94th Cong. § 160(c)(2)(D) (1976) *with* Clean Air Act Amendments of 1977, Pub. L. No. 95-95, tit. I, § 127(a), 91 Stat. 685, 741 (1977) (codified as amended at CAA § 169(4), 42 U.S.C. § 7479(4)). However, the legislative history does suggest that Congress intended its definition of "baseline concentration" to be interpreted in such a way that *changes* in emissions would be the focus of the increment calculus for replaced (and, by implication, modified) sources. In a report on the CAA Amendments of 1977, the Senate Committee on Environment and Public Works explained that emissions from sources that commence construction after January 6, 1975, are not in the baseline but are increment-consuming, and then clarified that "[t]his of cour[s]e does not include facilities built as replacements for sources in existence before January 6, 1975. Only the emissions from such replacement facilities *in excess of those* from the source replaced would be deducted from the increment." S. Rep. No. 95-127, at 97 (1977), *reprinted in* 3 A Legislative History of the Clean Air Act Amendments of 1977, at 1471 (1978) (emphasis added).

ii. *Agency Implementation of Congressional Intent*

Turning from congressional to administrative intent, we find compelling evidence that EPA has long held to the principles of consumption/expansion in its implementation of the PSD increment program. In iterations of the PSD regulations going back to the 1970s and continuing to the present day, the Agency has described the method of calculating how much increment remains available to prospective permittees as one involving evaluation of increases and decreases in emissions since the baseline date. *See*, *e.g.*, 72 Fed. Reg. 31,372, 31,376-77 (June 6, 2007); 45 Fed. Reg. 52,676, 52,717-20 (Aug. 7, 1980); 43 Fed. Reg. 26,388, 26,400-02 (June 19, 1978). For instance, in the preamble to the 1978 PSD regulations, the Agency explained:

> [I]ncrement consumption can be best tracked by tallying changes in the emission levels of sources contributing to the baseline concentration and increases in emissions due to new sources. * * * Thus, to implement the air quality increment approach set forth in the Act, the reviewing authority needs to verify that all changes from baseline emission rates (decreases or increases as appropriate) in conjunction with the increased emissions associated with approved new source construction will not violate an applicable increment or NAAQS.
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> * * *
>
> * * * Increases in the baseline emissions of sources contributing to the baseline concentration will also consume

> increment * * * . Conversely, reductions in the baseline emissions of sources existing [at the time of baseline establishment] generally expand the available PSD increment(s).

43 Fed. Reg. at 26,400-01; *accord* NSR Manual at C.10 ("The amount of PSD increment that has been consumed in a PSD area is determined from the emissions increases and decreases [that] have occurred from sources since the applicable baseline date.").

The Agency confirms this approach in its most current pronouncements on this topic, contained in the preamble to a rule proposing to clarify the PSD increment analysis. *See generally* 72 Fed. Reg. 31,372 (June 6, 2007). In a background section discussing existing practice, EPA identifies the compilation of "emissions inventories" as an important, long-established element of the increments analysis, as follows:

> The inventory of emissions includes emissions from increment-affecting sources at two separate time periods – the baseline date and the current period of time. For each source that was in existence on the relevant baseline date * * * , the inventory includes the source's actual emissions on the baseline date and its current actual emissions. The change in emissions over these time periods represents the emissions that consume increment (or, if emissions have gone down, expand the available increment). For sources constructed since the relevant baseline date, all their current actual emissions consume increment and are included in the inventory.

Id. at 31,377; *accord* NSR Manual at C.31-.36 (discussing selection of sources for PSD emissions inventories).

In addition, the Agency explains that in the past, it "never adopted detailed regulations establishing a specific methodology that sources and reviewing authorities must use to calculate an increase in concentrations for purposes of determining compliance with PSD increments." 72 Fed. Reg. at 31,378. Rather, it chose to describe its recommended approaches in guidance documents, leaving room for permitting authorities to exercise discretion in each unique circumstance.[37] *See id*. at 31,376. These representations tend to minimize the importance

[37] Indeed, EPA historically has "given reviewing authorities substantial leeway within the PSD program to select data and emissions calculation methodologies that they believe are representative of
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of the "plain language" upon which Sierra Club leans so heavily in this instance.

iii. *Plausible Alternative Interpretation*

We are not convinced that the statutory, regulatory, and preamble language that Sierra Club highlights is so clear and unambiguous. As Sierra Club rightly points out, "[f]or purposes of PSD permitting, [the term] 'construction' includes modifications." Reply to NMU at 29 n.13 (citing CAA §§ 169(2)(C), 111(a)(4), 42 U.S.C. §§ 7479(2)(C), 7411(a)(4); 40 C.F.R. § 52.21(b)(8)). Therefore, references in the statute, regulations, and preamble to sources upon which "construction" commenced or took place after a relevant baseline date, *see* CAA § 169(4), 42 U.S.C. § 7479(4) (last sentence); 40 C.F.R. § 52.21(b)(13)(ii)(a); 72 Fed. Reg. at 31,377 (last sentence of fragment quoted in Part II.B.1.d.ii above), may be reasonably interpreted to include not only newly built sources, but also modified sources. Assuming *arguendo* that this interpretation is appropriate for all three textual references (which we need not decide), such a reading would not necessarily dictate the result Sierra Club advocates.

Instead, one could reasonably construe the statutory, regulatory, and preamble language to mean that *all actual emissions from the modifications to a source* consume increment, not that *all actual emissions from the modifications to the source plus actual emissions from the portions of the source that were not modified* consume increment. In this way, the emissions in question could be specifically tied back to the modifications, and only those emissions would be considered increment-consuming. This reading strikes us as plausible. Sierra Club's "plain" language reading, on the other hand, produces results that confound the very sense and policy undergirding a workable increment consumption scheme. Were Sierra Club's views to prevail, no increment credit would be given for sources that shut down, and emissions already counted in the baseline concentration would be counted again against the PSD increment – in effect, double counting. *See* OA Tr. at 29-35. This seems a manifest unfairness and does violence to what we must assume to be a prudently conceived and administered system.

iv. *Conclusion on* "*Plain Language*"

In light of all the foregoing factors, it seems apparent that the Agency, implementing Congress' intent, designed the increment calculus to unfold in a very

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actual emissions." 72 Fed. Reg. at 31,386. In proposing new regulations to refine the PSD increment modeling procedures, the Agency has signaled an interest, going forward, in making more uniform the methods by which permitting authorities may conduct these analyses. *See id*. at 31,378. In so doing, however, the Agency has retained its basic approach to increments as one that takes into account emissions increases and decreases after applicable baseline dates. *E.g., id*. at 31,380, 31,384-85. At this writing, EPA has not finalized these proposed regulations.

different way than that urged by Sierra Club. We therefore find Sierra Club's "plain language" argument to be unpersuasive. *See, e.g., In re Rochester Pub. Utils.*, 11 E.A.D. 593, 603-08 (EAB 2004) (Board generally will give effect to unambiguous regulatory language, but where the meaning of a regulation is unclear, the Board must construe the regulation in light of its context and purpose), *appeal dismissed by stip. sub nom. Minn. Ctr. for Envtl. Advocacy v. EPA*, No. 05-1113 (8th Cir. Jan. 12, 2005).

v. *Remand for Record Clarification*

All this being said, we nonetheless find fault in the Department's rather cryptic explanation of the methodology for its increment calculus. MDEQ failed to provide even brief explanations of the reasons why it selected 1973 and 2006 as the relevant years from which to draw comparative emissions data, whether those data consisted of twelve-month averages or one-month or one-day snapshots, or why the Department did not average two years of pre- and post-modification emissions data to calculate "actual emissions," as indicated by the Agency's methods and guidelines for undertaking this calculus. *See* 40 C.F.R. § 52.21(b)(13)(ii), (21); *see also id.* pt. 51 app. W § 8.1.2.i & tbl. 8-2; 45 Fed. Reg. at 52,717-19; NSR Manual at C.10-.11, .35-.36, .44-.50.

The Board has long held that the administrative record for a final permit must reflect the permit issuer's "considered judgment," meaning the permit issuer has an obligation to articulate with reasonable clarity the reasons for its conclusions and the significance of the crucial facts it relied upon in reaching those conclusions. *See, e.g., In re Wash. Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 586-90 (EAB 2004); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997); *In re Austin Powder Co.*, 6 E.A.D. 713, 720 (EAB 1997); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 453-54 (EAB 1992); *see also In re Chem. Waste Mgmt., Inc.*, 2 E.A.D. 575, 579 (Adm'r 1988); *In re Carolina Power & Light Co.*, 1 E.A.D. 448, 451 (Acting Adm'r 1978). Moreover, it remains a perennial and important requirement that permit issuers "briefly describe and respond to all significant comments on the draft permit" in their response-to-comment documents. 40 C.F.R. § 124.17(a)(2). The Board has construed this provision as meaning that responses to comments must address the issues raised in a meaningful fashion and, though perhaps brief, must nonetheless be clear and thorough enough to adequately encompass the issues raised by commenters. *See, e.g., Wash. Aqueduct*, 11 E.A.D. at 586-90 (remanding for failure to respond to commenter's data sets showing differing metals levels in facility effluent); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 174-81 (EAB 2000) (remanding for failure to address commenter's alternative calculation of potential to emit lead); *In re RockGen Energy Ctr.*, 8 E.A.D. 536, 555-58 (EAB 1999); *In re Tallmadge Generating Station*, PSD Appeal No. 02-12, at 8-12, 22-28 (EAB May 21, 2003) (Order Denying Review in Part and Remanding in Part).

In the present case, many of the facts and analyses underlying MDEQ's various conclusions about the PSD increment calculus are missing from the permit record, including the response-to-comments document. Their absence, particularly in the face of Sierra Club's significant comments, is clear error. Accordingly, we remand this issue to MDEQ for reevaluation and clarification. We expect that, on remand, the Department will analyze with as much precision as reasonably possible the consumption/expansion of PSD increments and explain its analysis in a clear and meaningful fashion, including references to relevant statutory and regulatory provisions and Agency guidance where appropriate.

2. *Modeling of Source Impacts Using* "*Maximum*" *or* "*Worst-Case*" *Emissions*

Next, Sierra Club argues that the source impact analysis conducted for the proposed CFB boiler fails to reflect "maximum" or "worst-case" emissions and, as such, is "contrary to law and established EPA policy." Pet'n at 42. As support for this position, Sierra Club cites the NSR Manual, which provides the following guidance in a section on "Source Data" inputs to the air quality analysis:

> A source's ***emissions rate***as used in a[n air quality] modeling analysis for any pollutant is determined from the following source parameters (where MMBtu means "million Btu's heat input"):
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> - ***emissions limit***(e.g., *lb/MMBtu*);
> - ***operating level***(e.g., *MMBtu/hour*); and
> - ***operating factor***(e.g., *hours/day*, *hours/year*).
>
> * * *
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> For both NAAQS and PSD increment compliance demonstrations, the ***emissions rate***for the proposed new source or modification must reflect the maximum allowable operating conditions as expressed by the federally enforceable ***emissions limit***, ***operating level***, and ***operating factor***for each applicable pollutant and averaging time. The applicant should base the emissions rates on the results of the BACT analysis * * * .

NSR Manual at C.44-.45 (quoted in Pet'n at 43). Sierra Club also cites an Agency rule revising the *Guideline on Air Quality Models*, which states the following with respect to "Source Data" inputs to air models: "For point source applications[,] the load or operating condition that causes maximum ground-level concentrations [of

air contaminants] should be established. As a minimum, the source should be modeled using the design capacity (100 percent load)."[38] 70 Fed. Reg. 68,218, 68,240 (Nov. 9, 2005) (codified at 40 C.F.R. pt. 51 app. W § 8.1.2.a) (quoted in part in Pet'n at 43).

The parties do not dispute that worst-case emissions should be employed in the modeling analyses conducted to demonstrate a facility's compliance with the NAAQS and PSD increments. *See* Pet'n at 42-45; MDEQ Resp. at 20-22; Reply to MDEQ at 22-24; NMU Resp. at 26; Reply to NMU at 30-33. They differ, however, on whether the emissions rates used in the air models in this particular case actually represented the proposed CFB boiler's maximum worst-case emissions rates or some lesser, non-worst-case rates.

Sierra Club takes the position that the modeling performed for the CFB boiler did not incorporate worst-case emissions because MDEQ used the BACT emissions limits set forth in NMU's permit, multiplied by the maximum heat input, to model the boiler's maximum emissions. Pet'n at 43-44. The permitted emissions limits, however, have relatively long averaging periods – twelve months, thirty days, and twenty-four hours for SO_2, and twelve months or an unspecified "Test Protocol" interval[39] for PM, PM_{10}/$PM_{2.5}$, CO, and NO_x – whereas the relevant NAAQS and PSD increments have averaging periods as short as one hour (for CO), three hours (for SO_2), or eight hours (also for CO), in addition to longer twenty-four hour or annual averaging periods (for SO_2, PM_{10}, and NO_2). *Compare* Permit spec. cond. 1.1a-.1j, at 6 (BACT emissions limits for PM, PM_{10}, $PM_{2.5}$, SO_2, NO_x, and CO) *with* 40 C.F.R. §§ 50.4-.8, .11 (NAAQS for SO_2, PM_{10}, $PM_{2.5}$, CO, and NO_2) *and* 40 C.F.R. § 52.21(c) (increments for PM_{10}, SO_2, and NO_2). Thus, in Sierra Club's view, the Department's approach does not align with, or satisfy, the appropriate modeling benchmark.

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[38] EPA originally published its *Guideline on Air Quality Models* in April 1978 and incorporated it by reference into the PSD regulations in June 1978. Revision to the Guideline on Air Quality Models, 70 Fed. Reg. 68,218, 68,218 (Nov. 9, 2005); *see* 40 C.F.R. § 52.21(*l*)(1) (specifying that all estimates of ambient concentrations must be based on applicable air quality models, data bases, and other requirements set forth in the Agency's *Guideline*, which is codified in 40 C.F.R. pt. 51 app. W); *see also In re Prairie State Generating Co.*, 13 E.A.D. 1, 132 (EAB 2006) (noting that although the *Guideline on Air Quality Models* has been promulgated as codified regulatory text in Appendix W, it "provides permit issuers broad latitude and considerable flexibility in application of air quality modeling"), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007).

[39] The PSD permit specifies that "[s]tack testing procedures and the location of stack testing ports shall be in accordance with the applicable federal Reference Methods." Permit spec. cond. 1.9, at 8. NMU relies on that permit condition, in conjunction with EPA's standard test methods, to argue that the length of the test protocol intervals are not, in fact, unspecified. For instance, NMU claims that the sampling time for PM emissions must be at least 120 minutes. NMU Resp. at 26 (citing 40 C.F.R. § 60.50Da(b)(2)(i)). Neither NMU nor MDEQ, however, provide any other specific information on the federally required length of the averaging periods for PM, PM_{10}/$PM_{2.5}$, CO, or NO_x.

Sierra Club argues that modeled emissions limits can only represent "worst-case" emissions when they incorporate averaging times that are equal to or shorter than those of the compliance standards against which they are being measured (here, the NAAQS and PSD increments). Pet'n at 43-45; Reply to MDEQ at 23-24; Reply to NMU at 30-33; OA Tr. at 36-38. Sierra Club contends that longer averaging periods can mask shorter-term emissions spikes (e.g., an emissions limit averaged over a twelve or twenty-four hour period can be met even if emissions are extremely high for an hour or two, as long as emissions are sufficiently low for the remainder of the twelve or twenty-four hours in the averaging period). *See* Reply to MDEQ at 23; Reply to NMU at 30-33. It is the shorter-term spikes, however, that constitute the facility's "maximum" or "worst-case" emissions, claims Sierra Club, and it is those shorter-term spikes that Sierra Club argues are not captured and appropriately modeled in the source impact analyses conducted for NMU's proposed boiler. *See* Pet'n at 43-44; Reply to MDEQ at 23-24.

Sierra Club submitted comments along these lines during the public review period for NMU's draft PSD permit and also included a suggestion that the maximum hourly heat input rate be incorporated into the permit as an enforceable limit. *See* SC Cmts. at 36-39. MDEQ's total response to the group's comments consisted of the following two sentences: "The maximum hourly heat input rate and the hourly emissions are limited by the size of the equipment. A permit limit is not required." RTC Doc. at 15. In so responding, the Department chose not to directly engage Sierra Club's contention that averaging periods exceeding an hour in length cannot provide a basis for calculating maximum emissions.

MDEQ takes a different tack now, in response to Sierra Club's petition. The Department flatly contradicts the group's assertion that the air quality analysis used NMU's permitted emissions limits to model the boiler's SO_2 impacts. MDEQ Resp. at 21. Instead, the Department states that the modeling incorporated the "maximum, worst-case, *hourly* emission rate of SO_2 emissions," as documented in NMU's permit application and the MDEQ Air Dispersion Analysis Summary. *Id.* (emphasis added). Those documents list the maximum hourly emission rate for SO_2 as 8.78E+01 pounds per hour (or 87.8 pounds per hour), which equates to a modeled emission rate of 11.06 grams per second.[40] Permit Appl. § 6.3 tbl. 6-4, at 64; Air Analysis Summary at 1-2. NMU's permit application explains:

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[40] To convert an emissions rate measured in pounds per hour to the equivalent rate measured in grams per second, multiply *x* pounds per hour by 1 hour per 3,600 seconds by 453.59 grams per pound. Thus:

87.7 lb/hr *1 hr/3,600 sec *453.39 g/lb = 11.06 g/sec

Permit Appl. § 6.3, at 64.

> The maximum emission rates have been determined on a wors[t] case basis considering each type of fuel source (i.e., highest lb/hr rate from wood, coal, natural gas).
> * * *
>
> * * *
>
> For each pollutant with standards that have an annual averaging period, it was conservatively assumed that the maximum hourly emission rate would occur continuously (i.e., 24 hours per day and 365 days per year).

Permit Appl. § 6.3, at 64. In its response brief, MDEQ explains further that the source impact modeling assumed continuous operation of the boiler (a conservative assumption, since the boiler is not authorized to operate continuously) along with the burning of 3.5% sulfur by weight coal (another conservative assumption, since the boiler will burn coal with no more than 1.5% sulfur by weight). MDEQ Resp. at 21-22. Taken together, these assumptions guarantee, in MDEQ's view, that the source impacts of the proposed boiler will fall well under the NAAQS and PSD increments. *Id*. at 22.

As a threshold matter, questions pertaining to the appropriate pollutant emissions rates and other inputs to air quality models raise scientific and technical concerns that generally are best left to the specialized expertise and reasoned judgment of the permitting authority. Indeed, the Board has a well-established body of case law articulating deference in such circumstances, absent some strong evidentiary showing or argument by the petitioner that the permit issuer clearly erred in its technical analysis. *E.g.*, *In re Carlota Copper Co.*, 11 E.A.D. 692, 720 (EAB 2004) (Board "traditionally defer[s] to the technical expertise of the permit issuer in the absence of compelling or persuasive evidence or argument to the contrary"), *appeal docketed*, No. 07-1524 (S. Ct. June 6, 2008); *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 517-19 (EAB 2002) (same); *In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 667 (EAB 2001) (Board assigns "heavy burden" to petitioners seeking review of technical issues; "clear error or a reviewable exercise of discretion is not established simply because the petitioner presents a difference of opinion or alternative theory regarding a technical matter"); *In re Envotech, LP*, 6 E.A.D. 260, 284 (EAB 1996) (in general, Board will defer to permit issuer in technical areas "absent compelling circumstances"). In the circumstances of this case, however, the spareness of MDEQ's response to Sierra Club's detailed comments on this issue, along with the thinness of the permitting record and the shifting explanations by the Department, do not provide the necessary foundation for us to extend such deference.

Here, Sierra Club raised serious and substantial concerns touching on whether the modeled emissions (not just SO_2 emissions, but also PM_{10}, NO_x, and

CO emissions, which MDEQ failed altogether to address in its response to comments or this appeal) are truly "worst-case" emissions, as all parties agree they must be for the modeling to be valid. Neither the Department's response to comments, nor the permitting documents the Department references in its response to the petition, provide a straightforward answer to Sierra Club's concerns in this regard. For example, none of the record materials directly address the notion that long averaging periods may provide unsuitable bases for analyzing worst-case emissions impacts that occur over shorter time periods, particularly in the face of a host of NAAQS and increment compliance standards expressly setting short-duration averaging periods.

Moreover, MDEQ points out now (though it did not do so in its response to comments) that the record materials identify 87.8 pounds per hour as the proposed boiler's maximum hourly SO_2 emissions rate. MDEQ Resp. at 21 n.74 (citing Air Analysis Summary at 2; Permit Appl. § 6.3 tbl. 6-4, at 64). The provenance of this figure is not immediately clear.[41] At oral argument, MDEQ stated that some of these assumptions indeed played a role in the derivation of the worst-case emissions rates, explaining specifically that the 92% control efficiency condition is drawn from the New Source Performance Standards ("NSPS") applicable to NMU's facility. OA Tr. at 87; *see* Permit Appl. tbl. 4-1 n.1, at 24 ("SO_2 emission rates are based on 3.5 percent (average max.) sulfur coal and 92 percent reduction requirement per NSPS. The limits are also based on a 30-day rolling average.").[42] For its part, Sierra Club takes issue with the 92% reduction assumption and contends that a true "worst-case" emissions rate is an uncontrolled rate, which, by its calculations, would be 512.5 pounds of SO_2 per hour. Reply to MDEQ at 24 & n.12; Reply to NMU at 32 & n.18; OA Tr. at 113.

In our view, the record for this permit lacks a coherent, persuasive explanation of MDEQ's decision to rely on particular emissions rates for each of the relevant pollutants (i.e., not just SO_2 but also PM_{10}, NO_x, and CO[43]) as "worst-case"

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[41] One can perhaps piece together from various sections of the permit application some of the operating conditions that seem to have been assumed in the derivation of this purported "worst-case" figure. These conditions include the burning of coal with a maximum sulfur content of 3.5% and the use of pollutant control equipment that would achieve 92% reduction of SO_2 emissions, with boiler emissions being averaged over a thirty-day rolling time period. *See* Permit Appl. §§ 4.1 tbl. 4-1 & n.1, 5.3.1, 6.3, at 24, 42, 64 (information gleaned from emissions estimates section, control technology review section, and ambient impact analysis section of application).

[42] At oral argument, MDEQ also denied that the 87.8 pounds/hour figure reflected in any way a thirty-day rolling average, insisting instead that it represents the proposed boiler's maximum *hourly* emissions. OA Tr. at 88-89. We are unable to determine the truth of the matter from any of the materials in this record.

[43] As noted in our air quality introduction in Part II.B above, the proposed CFB boiler is considered a "major modification" that will result in a significant net increase in emissions of these four

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values suitable for use in the source impact modeling analysis. Instead, the record contains significant comments from Sierra Club questioning these matters and a dismissive, erratic, and inadequate response to those comments from the Department. *See* SC Cmts. at 36-39; RTC Doc. at 15. The Department's late-proffered explanations in briefs and argument before this Board fail to adequately clarify matters and, in any event, are incapable of repairing the record deficiencies. *See, e.g., In re Wash. Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 589 (EAB 2004) (a permit issuer "cannot through its arguments on appeal augment the record upon which the permit decision was based"). Accordingly, we have no sound basis upon which to defer to the Department's technical judgment on this foundational aspect of the air quality analysis. As noted in Part II.B.1 above, a permitting authority has a responsibility to explain its decisionmaking processes in ways that are meaningful, clear, and thorough enough to adequately address the issues raised by commenters. MDEQ failed to achieve this standard with respect to the question of worst-case emissions in the air models for NMU's boilers. We remand these issues to the Department for reevaluation and clarification as necessary.

3. *Preconstruction Monitoring*

We turn next to the issue of preconstruction monitoring. The CAA and implementing regulations establish a program for PSD permit applicant collection and submission of twelve months of ambient air quality monitoring data, for the year *preceding* the date of permit application, showing pollutant concentrations at the site of the proposed facility and in areas that may be affected by emissions from that facility. CAA § 165(a)(7), (e), 42 U.S.C. § 7475(a)(7), (e); 40 C.F.R. § 52.21(m). These data may then be used, in conjunction with other information, to demonstrate the facility's compliance with the NAAQS and PSD increments. *See* NSR Manual at C.16-.21.

A permitting authority has discretion to exempt a facility from the preconstruction monitoring requirements if either of the following two conditions is present: (1) the facility's modeled emissions predict air quality impacts that are lower than certain pollutant levels known as "significant monitoring concentrations" ("SMCs") or "monitoring *de minimis* levels"; or (2) the existing pollutant concentrations in the areas potentially affected by the facility are less than the SMCs.[44]

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pollutants. Consequently, the CAA's ambient air quality requirements apply with respect to each of these pollutants.

[44] As designed by EPA, the SMCs are a different animal, as it were, and enter the picture at a different point, than the "significant impact levels" or "SILs" mentioned above in the introduction to the air quality analysis discussion. *See supra* Part II.B; *see also* 40 C.F.R. § 52.21(i)(5)(i)-(ii) (SMCs); NSR Manual tbls. C-3 & C-4, at C.17, .28 (SMCs; SILs for Class II areas). SMCs are used for the specific purpose of evaluating whether a proposed facility should be required to conduct preconstruc-
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40 C.F.R. § 52.21(i)(5)(i)-(ii); *see In re EcoEléctrica, LP*, 7 E.A.D. 56, 61-65 (EAB 1997); Office of Air Quality Planning & Standards, U.S. EPA, EPA-450/4-87-007, *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)* § 2.1.1, at 4 (May 1987) [hereinafter *Ambient Monitoring Guidelines*]; NSR Manual at C.16-.17 & tbl. C-3. As a general matter, the results of the preliminary air quality analysis (also discussed in Part II.B above) are used to determine whether an applicant may be exempted from preconstruction monitoring. *In re Prairie State Generating Co.*, 13 E.A.D. 1, 92 n.100 (EAB 2006), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007); NSR Manual at C.18, .24.

In the instant case, the preliminary air quality analysis indicated that combined emissions from NMU's Ripley Heating Plant, including the existing boilers and the proposed CFB boiler, would result in ambient concentrations of CO, PM_{10}, and NO_x that are each less than their respective SMCs.[45] *See* Permit Appl. §§ 6.5.1, 6.5.4-.5, at 70-71, 74-76. The preliminary analysis also indicated that the proposed boiler alone, as well as in combination with the existing boilers, would generate SO_2 impacts greater than the SMC for that pollutant.[46] *See id.* § 6.5.2 & tbl. 6-10, at 71-72; MDEQ Resp. Ex. 9, at 2. Assuming these figures accurately portray the facts, it would appear that NMU had a legal obligation to conduct preconstruction monitoring for SO_2 but not for CO, PM_{10}, or NO_x.

In comments on the draft permit, Sierra Club submitted detailed observations about the preconstruction monitoring requirements and pointed out that the permitting record for NMU's proposed boiler lacked any explicit mention of, or demonstration of compliance with, those requirements. *See* SC Cmts. at 39-44. Sierra Club consequently argued that the air quality determination was "deficient" and that MDEQ therefore could not properly issue the permit to NMU. *Id.* at 42.

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tion ambient monitoring, whereas SILs are consulted by permitting authorities at an earlier stage to determine whether a proposed facility should be required to perform a full impact analysis or just a preliminary impact analysis. *See* NSR Manual fig. C-3, at C.27 (flow chart showing that determination of whether modeled impacts exceed SILs precedes use of SMCs to determine need for preconstruction monitoring); *see also In re EcoEléctrica, LP*, 7 E.A.D. 56, 62-66 & nn.5, 10-11 (EAB 1997); 73 Fed. Reg. 28,321, 28,324 (May 16, 2008).

[45] Notably, the record materials do not explicitly mention the SMCs for these pollutants or where NMU's projected emissions fall with respect to the SMCs. Instead, they focus on the SILs and report that projected emissions are less than the relevant SILs. Upon further inquiry, we find that the SMCs for CO, PM_{10}, and NO_x are greater in magnitude than their comparable SILs, so emissions of these pollutants at levels below the SILs would necessarily also fall below the SMCs. *Compare* 40 C.F.R. § 52.21(i)(5)(i)-(ii) (SMCs) *with* NSR Manual tbl. C-4, at C.28 (SILs).

[46] Again, the record materials do not mention the SMC for SO_2 or where NMU's projected emissions fall with respect to that SMC. Upon investigation, we find that the SMC for SO_2 averaged over 24 hours is greater than the comparable SIL for that pollutant (13 g/m^3 versus 5 g/m^3), but NMU's projected 24-hour-average emissions of SO_2 (61 g/m^3) exceed both the SMC and the SIL.

MDEQ's full response to the Club's detailed comments stated that its own "experience with monitoring in the Upper Peninsula shows consistent background levels across a large geographical area including the location of this facility. Therefore, [the Department] did not require pre-construction monitoring. No written waiver was requested by the permit applicant, and none was issued by [MDEQ]." RTC Doc. at 15.

On appeal, Sierra Club essentially repeats its comments on the draft permit, choosing to continue to press its points in light of the Department's failure, in its view, to adequately respond to them. Accordingly, Sierra Club urges the Board to remand NMU's permit on several grounds. First, Sierra Club argues that the "plain language" of the CAA and implementing regulations directs PSD permit applicants to install a series of continuous ambient air quality monitors around the areas of their proposed facilities and gather twelve months of data therefrom for the sole purpose of determining whether the facilities will violate the NAAQS or PSD increments. Pet'n at 45-48; Reply to MDEQ at 25-26. In this line of argument, data gathered for other purposes (such as state air quality planning) or from monitors that are not in areas affected by the proposed facility (i.e., that are not "site-specific") would be unsuitable for use in fulfilling the preconstruction monitoring requirement. Pet'n at 46-48.

Second, Sierra Club acknowledges the existence of long-standing Agency guidance that suggests, contrary to Sierra Club's plain language argument, that the requirement to collect site-specific monitoring data can be waived in certain circumstances. Pet'n at 48-50; Reply to MDEQ at 26-28; OA Tr. at 16-21. Such waiver can occur in cases where existing ambient data are deemed sufficiently representative of air quality in the targeted area – in terms of the sufficiency of the monitoring locales selected and the quality and currentness of the monitoring data – to legitimately be substituted for site-specific data. *See* NSR Manual at C.18-.19; *Ambient Monitoring Guidelines* § 2.4, at 6-9; *see also*, *e.g.*, *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 145-48 (EAB 1999); *In re Haw. Elec. Light Co.*, 8 E.A.D. 66, 97-105 (EAB 1998); *In re Hibbing Taconite Co.*, 2 E.A.D. 838, 850-51 (Adm'r 1989). Sierra Club refuses to concede that permit issuers have legal authority to issue such waivers, Pet'n at 49 n.7, but, in the event this argument does not prevail, Sierra Club contends in the alternative that MDEQ failed to fulfill the requirements of this Agency policy. According to Sierra Club, the Department erroneously failed to include any explicit findings in the permitting record on the validity, sufficiency, or representativeness of any substitute data that might have been used to justify NMU's *de facto* preconstruction monitoring waiver. *Id*. at 48-50; Reply to MDEQ at 26-28.

Third, Sierra Club argues that even if MDEQ had attempted to demonstrate fulfillment of the conditions of EPA's waiver policy in this case, the Department would have been constrained to conclude that the substitute data were, in fact, not representative. Pet'n at 50-54. Sierra Club begins with the issue of monitor loca-

tion, noting that the record contains no evidence of monitors used other than an oblique reference to "background concentrations" collected at Escanaba, Michigan (SO_2); Two Rivers, Wisconsin (NO_x); Green Bay, Wisconsin (PM_{10}); and Milwaukee, Wisconsin (CO and lead). *Id*. at 51 (citing Permit Appl. app. C); Reply to MDEQ at 27-28. Sierra Club points out that Agency policy allows data from off-site monitors to be used if those data represent the locations of: (a) maximum concentration increase from the proposed facility; (b) maximum air pollutant concentration from existing sources; and (c) maximum combined impact area (existing sources plus proposed facility). Pet'n at 51 (citing *Ambient Monitoring Guidelines* § 2.4.1, at 6-8; *Hibbing Taconite*, 2 E.A.D. at 850-51). The record contains no evidence, claims Sierra Club, that these particular monitors, or any others for that matter, satisfy any of these requirements.[47] Pet'n at 51; *see* OA Tr. at 18-21, 114-15. Sierra Club similarly asserts that the record contains no evidence demonstrating fulfillment of Agency guidelines on the requisite *quality* (in terms of monitor calibration, data recovery, and other standards) or *currentness* (in terms of most recent three years) of the data collected from these or any other off-site monitors. Pet'n at 53-54.

In response, MDEQ dismisses all of Sierra Club's arguments as baseless. First, the Department claims that nothing in the CAA requires that preconstruction monitoring data be collected by a permit applicant for the sole purpose of analyzing its proposed facility's source impacts, as Sierra Club contends. MDEQ Resp. at 22. Where existing representative data collected by others exist, any requirement imposed on an applicant to collect additional monitoring data would, in MDEQ's view, "needlessly" and "wasteful[ly]" require the applicant to "expend resources." *See id*. at 23. The Department then asserts that existing data collected by others does exist in this case, from the years 2003 through 2005, and it sanctioned their use as sufficiently representative for NMU's situation. *Id*. at 23-25; OA Tr. at 91-99.

MDEQ explains that on August 21, 2006, it sent a table of background pollutant concentrations to NMU for use in the source impact analysis. *Id*. at 23-24 (citing Permit Appl. at 69 & app. C). The table lists three monitoring samples from the years 2003 through 2005 for each of five pollutants and selects the highest sample value for each pollutant as the appropriate "background concentration" for NMU's analysis. *See* Permit Appl. tbl. 6-8, at 69, & app. C. For example,

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[47] Sierra Club also observes that NMU's boiler will be situated in a "multisource impact area," meaning its impacts will be added to those of two already existing coal-fired plants (Marquette and Presque Isle) and two mining companies (Empire Iron and Tilden Mining). Pet'n at 51-52. EPA's *Ambient Monitoring Guidelines*, claims Sierra Club, discourage substitution of off-site monitoring data in such circumstances, but MDEQ failed to acknowledge or abide by this policy. *Id*. The Department also purportedly ignored certain other Agency guidelines regarding monitor selection in areas that have multiple air pollution sources and flat terrain. *Id*. at 52 (citing *Ambient Monitoring Guidelines* § 2.4.1, at 6-8).

MDEQ chose readings collected in 2003-2004 from an SO_2 monitor in Escanaba, Michigan, 65.3 kilometers distant from NMU's campus, along with a reading collected in 2005 from an SO_2 monitor in Michigan's Seney National Wildlife Refuge, 158.5 kilometers distant, to represent the background SO_2 concentration in the ambient air around the proposed boiler in Marquette. *Id*. As the Department observes, it "determined that regional monitoring data from monitors located in Michigan and Wisconsin [were] appropriate for NMU's air quality analysis because [those data were] either representative of air quality near NMU or even more conservative because [they] reflected higher concentrations of criteria pollutants in the ambient air than those present in Marquette." MDEQ Resp. at 24; *accord* OA Tr. at 91-99.

MDEQ did not release this kind of information in its response to comments. There, the Department simply remarked on the existence of "consistent background levels" of pollutants across the Upper Peninsula, including the areas around NMU's campus. RTC Doc. at 15. In so doing, the Department may have intended to indicate that it had decided to grant NMU an *exemption* from the preconstruction monitoring requirement, pursuant to 40 C.F.R. § 52.21(i)(5)(ii), because the background pollutant concentrations were less than their respective SMCs. This interpretation of events is somewhat appealing in that it lends some consistency to MDEQ's other ambiguous statement that NMU did not request a written waiver from preconstruction monitoring and MDEQ did not issue one – instead, perhaps, the Department, *sua sponte*, simply granted an exemption and made a waiver unnecessary. *See* RTC Doc. at 15.

The situation is muddled, however. MDEQ's response on appeal seems to indicate that preconstruction monitoring was, in fact, conducted after all, for all pollutants, pursuant to a *de facto* waiver allowing the use of existing ambient data from air monitors in Escanaba, Two Rivers, Green Bay, Milwaukee, and elsewhere. *See* MDEQ Resp. at 23-25. Matters are further confused by NMU's contentions that its emissions will result in concentrations less than the SMCs for all pollutants except SO_2, and thus MDEQ required preconstruction monitoring only for that pollutant, which the Department appropriately conducted using representative off-site data. *See* NMU Resp. at 27 (citing Permit Appl. at 69). Put another way, and attempting to harmonize a discordant presentation, NMU may be claiming that MDEQ granted it a preconstruction monitoring *exemption* for PM_{10}, CO, and NO_x emissions and a *waiver* for site-specific SO_2 emissions.

At the outset, we reject Sierra Club's contention that the plain language of the CAA and implementing regulations mandate the use of site-specific, sole-purpose preconstruction ambient air quality data. *See* Pet'n at 46-48 (quoting CAA § 165(a)(7), (e)(1)-(2), 42 U.S.C. § 7475(a)(7), (e)(1)-(2); 40 C.F.R. § 52.21(m)(1)(i), (iii)-(iv)); Reply to MDEQ at 25-26. In so arguing, Sierra Club overlooks statements of congressional intent to the contrary. H.R. Rep. No. 95-294, at 171 (1977) ("preconstruction, onsite air quality monitoring may be

for less than a year if the basic necessary information can be provided in less time, or it may be waived entirely if the necessary data [are] already available"); H.R. Rep. No. 95-564, at 152 (1977) (Conf. Rep.) (one-year monitoring requirement "may be waived by the [s]tate"). EPA has long implemented the PSD program pursuant to the understanding that representative data may be substituted where circumstances warrant, *see, e.g.*, NSR Manual at C.18-.19; *Ambient Monitoring Guidelines* § 2.4, at 6-9, and the Board and its predecessors have long upheld the Agency's guidance to that effect. *E.g.*, *Knauf*, 8 E.A.D. at 145-48; *Haw. Elec.*, 8 E.A.D. at 97-105; *Hibbing*, 2 E.A.D. at 850-52. Sierra Club has failed to persuade us to deviate from these precedents here.

That being said, preconstruction monitoring is yet another element of the PSD permitting program that MDEQ failed to treat with due care in these proceedings. Sierra Club submitted detailed, significant comments on this topic during the public review period, *see* SC Cmts. at 39-44, but the Department abruptly dismissed them in its response-to-comments document with the vague three-sentence answer quoted above. *See* RTC Doc. at 15. This state of affairs does not comport with 40 C.F.R. § 124.17(a)(2) and concomitant well-settled Board case law, which place upon permit issuers an obligation to provide meaningful responses to significant comments that articulate with reasonable clarity the facts and circumstances supporting the permit issuers' decisions. *E.g.*, *In re Amerada Hess Corp.*, 12 E.A.D. 1, 14-20 (EAB 2005); *In re Wash. Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 586-90 (EAB 2004); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 174-81 (EAB 2000); *In re RockGen Energy Ctr.*, 8 E.A.D. 536, 555-58 (EAB 1999); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997); *In re Austin Powder Co.*, 6 E.A.D. 713, 720 (EAB 1997); *In re Tallmadge Generating Station*, PSD Appeal No. 02-12, at 8-12, 22-28 (EAB May 21, 2003) (Order Denying Review in Part and Remanding in Part). The Department further clouds matters, rather than clarifies them, in its brief. Accordingly, remand is warranted on this ground. On remand, the Department must reevaluate the issue of preconstruction monitoring for NMU's proposed boiler and explain the ways in which its ultimate decisions on the topic comply with the applicable provisions of the statute and regulations and reflect Agency guidance on data representativeness and related matters.

4. *Class I Increment Analysis*

Finally, Sierra Club challenges MDEQ's analysis of the proposed boiler's effects on PSD increment in several Class I areas. In brief, Sierra Club argues that the Department unlawfully used SILs and arbitrary distances to excuse NMU from preparing increment consumption analyses that otherwise would be mandated by the CAA and its implementing regulations. Pet'n at 54-58; Reply to MDEQ at 29-30.

Under the CAA and its implementing regulations, permit issuers are obliged to notify federal managers of any lands within Class I areas that "may be affected" by emissions from a proposed major emitting facility. CAA § 165(d)(2)(A), 42 U.S.C. § 7475(d)(2)(A); 40 C.F.R. § 52.21(p); *see* 40 C.F.R. § 124.42(a). EPA has interpreted the "may affect" clause as including all facilities proposing to locate within 100 kilometers ("km") – or about 62 miles – of a Class I area, as well as certain large facilities proposing to locate more than 100 km from Class I areas. *See* NSR Manual at E.16. Moreover, as discussed above, permit applicants are legally obligated to demonstrate that their proposed facilities will not cause or contribute to air pollution in violation of any PSD increment, including the Class I increments. CAA § 165(a)(3)(A), 42 U.S.C. § 7475(a)(3)(A); 40 C.F.R. § 52.21(k)(2). This latter requirement applies irrespective of distance.

Of course, as implemented, the PSD program does not mandate that each permitting record contain an increment consumption analysis for every Class I area in the country, regardless of distance from the proposed major emitting facility. As the EPA Administrator stated in a prior case:

> EPA has implicitly countenanced the view that, as a practical matter, pollution sources may be too distant from a specific area to have anything except an imperceptible or insignificant effect on the area in question. In other words, the mere possibility of pollution molecules being transported from a source to a [C]lass I area is not, by itself, sufficient reason to trigger the demonstration requirements of the [CAA].

In re Old Dominion Elec. Coop., 3 E.A.D. 779, 781 (Adm'r 1992). Thus, where reasonable, EPA has historically attempted to streamline the PSD permitting process by promulgating specific thresholds, such as SILs, beneath which impacts are deemed to be insignificant and certain complex analyses not necessary.

To date, EPA has promulgated SILs only for Class II areas, which cover most of the country. *See* NSR Manual tbl. C-4, at C.28. For Class I areas, in lieu of actual SILs, but serving roughly the same function, the Agency has chosen instead to recommend that a full source impact analysis be conducted for any proposed facility that will increase pollutant concentrations in a Class I area by 1 g/m^3 (24-hour average) or more. *Id.* at E.16-.17; *see In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 155-56 (EAB 1999). Importantly, however, EPA does not stop with this threshold. The Agency goes on to acknowledge that certain attributes of Class I areas may be sensitive to pollutant increases that are less than 1 g/m^3. NSR Manual at E.17; *see id.* at E.10-.12 (discussing special attributes of Class I areas). The Agency consequently suggests that permit issuers consult with federal land managers to decide what specific level of impact analysis is necessary in a given case. *Id.* at E.17-.18.

In the case before us, the Class I areas nearest NMU's Ripley Heating Plant are the Seney National Wildlife Refuge in Seney, Michigan, approximately 55 miles (89 km) away;[48] Isle Royale National Park on Isle Royale in Lake Superior, an unspecified distance away (although farther than Seney); and the Forest County Potawatomi Community Reservation near Crandon, Wisconsin, at least 100 miles (160 km) away. *See* RTC Doc. at 13; *see also* MDEQ Resp. Ex. 10; 73 Fed. Reg. 23,086 (Apr. 29, 2008) (final Class I designation notice for Forest County).

The permitting record indicates that in May 2007 and/or April 2008, MDEQ contacted federal representatives regarding potential CFB boiler emissions impacts to Isle Royale National Park and Seney National Wildlife Refuge.[49] *See* RTC Doc. at 13; Air Analysis Summary at 1-2; MDEQ Resp. Ex. 10 (E-mails from/to Steve Kish, MDEQ, to/from Jill Webster, U.S. Fish & Wildlife Service (Apr. 10, 2008)). The record indicates further that these representatives reported that they did not expect any adverse impacts to visibility or air quality related values on the basis of the NMU boiler information sent them by MDEQ. RTC Doc. at 13; MDEQ Resp. Ex. 10. Moreover, MDEQ explains that the air quality modeling conducted for NMU's boiler revealed a maximum increase of 0.42 g/m^3 in the 24-hour average SO_2 concentration at Seney National Wildlife Refuge, the closest Class I area to Marquette. RTC Doc. at 13. This figure, at less than half the informal significance level recommended by EPA, appears to have provided the Department with its rationale for excusing NMU from conducting increment analyses for the Isle Royale, Seney, and Forest County Class I areas.[50] *See id.*

On appeal, Sierra Club argues that the 1 g/m^3 Class I threshold lacks a legal basis and thus MDEQ erred in relying on it. Pet'n at 55. To the extent this is an argument that 1 g/m^3 is not a regulatory requirement, we agree. *Knauf*, 8 E.A.D. at 156 n.49. However, this figure is a long-established EPA guideline. NSR Manual at E.16-.17. Importantly, the NSR Manual stresses the need for permit issuers to consult with federal land managers about air quality issues, and MDEQ appears to have adequately fulfilled that responsibility here, as documented in the response to comments and elsewhere in the record. Sierra Club has failed to show

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[48] The record actually contains several estimates of the distance between NMU's facility and Seney National Wildlife Refuge. *See* RTC. Doc. at 13 (refuge is approximately 55 miles (or about 89 km) to east-southeast of NMU facility); MDEQ Resp. Ex. 10 (northwest corner of refuge is approximately 93.5 km from NMU); Permit Appl. § 3.1, at 14 & app. C (refuge is about 60 miles away; SO_2 monitor in refuge is 158.5 km away).

[49] These representatives may or may not have been the federal land managers for the affected areas; the record does not make these points clear. Sierra Club, however, does not take issue with the identity of these parties, and thus we do not address the matter further.

[50] Sierra Club's contention that MDEQ employed an arbitrary distance threshold of 100 miles to excuse NMU from analyzing impacts to the Forest County Reservation is speculative.

clear error in the Department's handling of these issues or other grounds for a grant of review on this basis. *See* 40 C.F.R. § 124.19(a).

III. *CONCLUSION*

For the foregoing reasons, we remand five components of NMU's PSD permit decision, as summarized below, for further proceedings consistent with this opinion.

First, we remand the permit for MDEQ to reconsider the BACT limitations chosen for SO_2 emissions from the proposed CFB boiler. On remand, MDEQ will be expected to ensure that a rational, defensible BACT determination is made for this pollutant, involving consideration of all requisite statutory and regulatory criteria and giving attention as appropriate to the clean fuels issue. MDEQ will also be expected to clearly document all facets of its BACT-related decisions in the administrative record. In particular, any contention that particular fuel choices or related factors would improperly "redefine the source" must be thoroughly explained and supported with references to suitable legal authority. *See supra* Part II.A.3.

Second, we remand the permit for MDEQ to analyze whether CO_2 and N_2O emissions from the CFB boiler should be limited pursuant to BACT. MDEQ should be guided in these efforts by our recent decision in *In re Deseret Power Electric Cooperative*, 14 E.A.D. 212 (EAB 2008). Included in its evaluation should be MDEQ's assessment whether approval by EPA of CO_2- and N_2O-related provisions in certain existing SIPs constitutes regulation of those pollutants under the Act. MDEQ will be expected to clearly document its decisions in the administrative record. *See supra* Part II.A.4.b.

Third, we remand the permit for MDEQ to reevaluate and clarify its analysis of PSD increments consumed/relinquished by the CFB boiler, other boilers in the Ripley Heating Plant, and other sources in relevant affected areas. On remand, MDEQ will be expected to analyze with as much precision as reasonably possible the consumption/expansion of PSD increments and explain its analysis in the record in a clear and meaningful fashion, including references to relevant statutory and regulatory provisions and Agency guidance where appropriate. *See supra* Part II.B.1.

Fourth, we remand the permit so that MDEQ can ensure that the source impact modeling analyses for SO_2, PM_{10}, NO_x, and CO are conducted on the basis of the maximum, "worst-case" emissions rates of those pollutants. MDEQ will be expected to document its decisions in this regard in a clear and meaningful fashion. *See supra* Part II.B.2.

Fifth, we remand the permit for MDEQ to reevaluate the issue of preconstruction monitoring and explain, in the record, the ways in which its ultimate decisions on this topic comply with the applicable provisions of the statute and regulations and reflect Agency guidance. *See supra* Part II.B.3.

Finally, on each of these five matters, MDEQ is directed to craft new or revised permit terms as necessary, submit any such permit terms and all other findings on remand to public review, and consider and respond to significant public comments in its documentation of the revised final permit decision. Pursuant to 40 C.F.R. § 124.19(f)(1)(iii), an appeal of the Department's decision after remand will be required to exhaust administrative remedies. Accordingly, any party who participates in the remand process and is not satisfied with MDEQ'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 Board's remand. Review of all other issues is denied.

So ordered.