

**FOR PUBLICATION**

**UNITED STATES COURT OF APPEALS  
FOR THE NINTH CIRCUIT**

NATIONAL PARKS CONSERVATION  
ASSOCIATION; MONTANA  
ENVIRONMENTAL INFORMATION  
CENTER; SIERRA CLUB,

*Petitioners,*

v.

U.S. ENVIRONMENTAL PROTECTION  
AGENCY and LISA P. JACKSON,  
Administrator, United States  
Environmental Protection Agency,

*Respondents,*

PPL MONTANA, LLC,

*Respondent-Intervenor.*

No. 12-73710

PPL MONTANA LLC,

*Petitioner,*

NATIONAL PARKS CONSERVATION  
ASSOCIATION, MONTANA

ENVIRONMENTAL INFORMATION  
CENTER, AND SIERRA CLUB,

*Intervenors,*

v.

U.S. ENVIRONMENTAL PROTECTION  
AGENCY and LISA P. JACKSON,

*Respondents.*

No. 12-73757

EPA No.  
EPA-R08-OAR-  
2011-0851

OPINION

On Petition for Review of an Order of the  
Environmental Protection Agency

Argued and Submitted  
May 16, 2014—Seattle, Washington

Filed June 9, 2015

Before: Diarmuid F. O'Scannlain, Marsha S. Berzon,  
and Richard C. Tallman, Circuit Judges.

Opinion by Judge O'Scannlain;  
Concurrence by Judge Berzon

**SUMMARY\***

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**Environmental Law**

The panel granted in part and denied in part petitions for review brought by environmental organizations and PPL Montana, LLC, the operator and partial owner of hydroelectric power plants in Montana, challenging the Environmental Protection Agency's regional haze regulations for the State of Montana, which prescribe emission limits at certain power plants.

The Clean Air Act requires that all implementation plans require installation of the "best available retrofit technology" (BART) to reduce emissions from certain emission sources that were operational between 1962 and 1977. PPL Montana operates and partially owns coal-fired and hydroelectric power plants in Montana, including the Colstrip Steam Electric Generating Station and the J.E. Corette Steam Electric Station.

Concerning the Colstrip station, the panel held that EPA's BART determination for Nitrogen Oxide emissions at Colstrip Units 1 and 2 was arbitrary and capricious. The panel also held that EPA's determination of BART to control sulphur dioxide emissions at Colstrip Units 1 and 2 was arbitrary and capricious. The panel held that the seeming inconsistency in EPA's BART determinations at Colstrip Units 1 and 2 and Corette, absent explanation, was arbitrary and capricious. The panel further held that EPA did not

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\* This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

meaningfully address PPL Montana's comment concerning the EPA's use of the CALPUFF visibility model in determining BART at Colstrip Units 1 and 2.

Concerning the Corette station, the panel held that EPA's determination – that installation of additional technology to control emissions from the Corette station was not cost effective – suffered the same failure of explanation as its BART determinations at Colstrip. The panel noted that the Final Rule tightened the emissions limits identified for Corette in the Proposed Rule. The panel held that after EPA found Corette already had BART technology in place, it was authorized by the Regional Haze Rule to skip the remaining analyses in the section. The panel further held that PPL Montana's contention that EPA was nevertheless required to proceed with the remaining BART analysis was a challenge to the provision of the Regional Haze Rule itself, and was not properly asserted in the challenge to the Montana Final Implementation Plan. The panel also held that EPA properly set emissions limits for Corette on a 30-day rolling average. The panel rejected the environmental groups' contention that EPA's decision not to require any additional emission-reducing technology at Colstrip Units 3 and 4 was arbitrary and capricious because it failed to satisfy the Clean Air Act's reasonable progress requirements.

The panel vacated the portions of the Final Rule setting emissions limits at Colstrip Units 1 and 2 and Corette, and remanded to EPA for further proceedings.

Concurring, Judge Berzon wrote separately to emphasize her understanding that the lead opinion is not impugning the EPA's use of the CALPUFF model generally, but only requiring a sufficiently reasoned response to a particular

comment regarding CALPUFF's usefulness in these specific circumstances.

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### COUNSEL

Lisa S. Blatt, Arnold & Porter LLP, Washington, DC, argued the cause and filed the briefs for petitioner PPL Montana. With her on the briefs were Jonathan S. Martel and Christopher A. Jaros, Arnold & Porter, LLP, Washington, DC.

Jenny K. Harbine, EARTHJUSTICE, Bozeman, MT, argued the cause and filed the briefs for NPCA. With her on the briefs was Janette K. Brimmer, EARTHJUSTICE, Seattle, WA.

Daniel Pinkston, Environmental Defense Section, Environment and Natural Resources Division, United States Department of Justice, Denver, CO, argued the cause and filed the brief for respondents. With him on the brief were Ignacia S. Moreno, Assistant Attorney General, Environment and Natural Resources Division, United States Department of Justice, Denver, CO, and Elizabeth B. Dawson, Environmental Defense Section, Environment and Natural Resources Division, United States Department of Justice, Denver, CO.

Michael G. Jenkins, Assistant General Counsel, PacifiCorp Energy, Salt Lake City, UT and E. Blaine Rawson, Ray Quinney & Nebeker, P.C., Salt Lake City, UT, filed the brief for Amicus Curiae PacifiCorp.

**OPINION**

O'SCANNLAIN, Circuit Judge:

We must decide whether the Environmental Protection Agency's regional haze regulations for the State of Montana lawfully prescribe emission limits at certain power plants.

**I**

Petitioner PPL Montana operates and partially owns coal-fired and hydroelectric power plants in Montana, including the Colstrip Steam Electric Generating Station (“Colstrip”) and the J.E. Corette Steam Electric Station (“Corette”). Petitioners National Parks Conservation Association, Montana Environmental Information Center, and Sierra Club (collectively, “NPCA”) are nonprofit conservation organizations whose members enjoy wilderness areas impacted by EPA's regional haze regulations for the State of Montana. Both petitioners are dissatisfied with such regulations. PPL Montana argues, in essence, that they are too stringent; NPCA argues, to the contrary, that they do not do enough to remedy visibility impairment caused by regional haze in various relevant wilderness areas.

**A**

Regional haze is “visibility impairment caused by geographically dispersed sources emitting fine particles and their precursors into the air.” *Am. Corn Growers Ass'n v. EPA*, 291 F.3d 1, 3 (D.C. Cir. 2002) (per curiam) (citing Regional Haze Regulations, 64 Fed. Reg. 35,714 (July 1, 1999) (codified at 40 C.F.R. Pt. 51)). Congress enacted §§ 169A and 169B of the Clean Air Act (the “CAA” or the

“Act”) to address the problem of regional haze. *Id.* at 3–4; *see* Clean Air Act Amendments of 1977, Pub. L. No. 95–95, § 128, 91 Stat. 685, 742 (current version at 42 U.S.C. § 7491); Clean Air Act Amendments, Pub L. No. 101–549, § 816, 104 Stat. 2695 (1990) (current version at 42 U.S.C. § 7492). These provisions establish as a national goal the “prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I areas which impairment results from manmade air pollution.”<sup>1</sup> 42 U.S.C. § 7491(a)(1).

The Act imposes several requirements on States and on EPA relevant to this case. First, the Act requires EPA to promulgate regulations to “assure . . . reasonable progress toward meeting the national goal” of regional haze reduction. 42 U.S.C. § 7491(a)(4). Second, the Act invites each State to submit to EPA a “State Implementation Plan” (“SIP”) setting forth emission limits and other measures necessary to make reasonable progress toward the national visibility goal. *See* 42 U.S.C. §§ 7410(a), 7491(b)(2). If, like Montana, a State chooses not to submit such a plan, the Act requires EPA to produce a “Federal Implementation Plan” (“FIP”) for that State. *See* 42 U.S.C. § 7410(c)(1)(A).

The Act further provides that all implementation plans must require installation of the “best available retrofit

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<sup>1</sup> Class I areas include, *inter alia*, national wilderness areas exceeding 5,000 acres in size and national parks in existence on August 7, 1977 exceeding 6,000 acres in size. *See* 42 U.S.C. § 7472(a). The term “mandatory class I federal areas” describes those that “may not be designated as other than class I.” *Id.* § 7491(g)(5). Relevant here, Yellowstone National Park, Glacier National Park, UL Bend National Wildlife Refuge, and Medicine Lake Wilderness Area have been designated mandatory Class I areas. *See* 40 C.F.R. §§ 81.400, 81.417.

technology” (“BART”) to reduce emissions from certain emission sources that were operational between 1962 and 1977 (“BART-eligible sources”). *See* 42 U.S.C. § 7491(b)(2), (g). Five statutory factors determine which type of emissions-reducing technology constitutes BART for such sources:

- (a) the costs of compliance;
- (b) the energy and non-air quality environmental impacts of compliance;
- (c) any existing pollution control technology at a source;
- (d) the remaining useful life of the emission source; and
- (e) the degree of visibility improvement anticipated[.]

42 U.S.C. § 7491(g)(2).

Pursuant to the Act, EPA promulgated its Regional Haze Regulations (the “Regulations”), which asked certain States, including Montana, to analyze sources of emissions within the State and to develop a plan to eliminate all man-made visibility impacts by 2064. *See* 64 Fed. Reg. at 35,714; 40 C.F.R. § 51.308. The Regulations require any implementation plan to include (1) “reasonable progress goals”; (2) a calculation of baseline and natural visibility conditions; (3) a long-term strategy for achieving “reasonable progress goals”; and (4) additional monitoring of emission sources in Class I federal areas. *See* 40 C.F.R. § 51.308(d)(1)–(4). After the D.C. Circuit vacated the provisions of the Regulations relating to BART determinations, *see Am. Corn Growers*, 291 F.3d at 6, EPA



promulgated new BART regulations in its Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations (the “2005 Regulations”), which revised the text of the earlier Regulations. *See* 70 Fed. Reg. 39,104 (July 6, 2005).

EPA also published its Guidelines for BART Determinations Under the Regional Haze Rule (the “Guidelines”), 40 C.F.R. Pt. 51, App. Y (Sept. 6, 2005), prescribing five steps for application of the five statutory BART factors:

- (Step 1) Identify all available retrofit control technologies;
- (Step 2) Eliminate technically infeasible options;
- (Step 3) Evaluate the control effectiveness of remaining control technologies;
- (Step 4) Evaluate impacts (identified in § 7491(g)(2), *see* 40 C.F.R. Pt. 51, App. Y, § IV.D.4, 70 Fed. Reg. at 39,166) and document the results;
- (Step 5) Evaluate visibility impacts (measured in “deciviews,” *see* 40 C.F.R. § 51.301).<sup>2</sup>

*Id.* App. Y § IV.D.

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<sup>2</sup> “Deciview means a measurement of visibility impairment.” 40 C.F.R. § 51.301. “Each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility at one deciview.” Proposed Rule, 77 Fed. Reg. at 23,992.

## B

In 2006, the Montana Department of Environmental Quality notified EPA that it did not intend to produce a SIP triggering EPA's obligation to produce a FIP for the State of Montana. *See* 42 U.S.C. § 7410(c)(1)(A). EPA published a proposed FIP for Montana on April 20, 2012 (the "Proposed Rule"). *See* Approval and Promulgation of Implementation Plans; State of Montana, 77 Fed. Reg. 23,988 (Apr. 20, 2012).

The Proposed Rule required petitioner PPL Montana to take various actions to reduce emissions of two compounds—nitrogen oxide ("NO<sub>x</sub>") and sulfur dioxide ("SO<sub>2</sub>")—at two power plants it partially owns and operates, Colstrip and Corette. First, PPL Montana was required to implement several new technologies at Units 1 and 2 of the four-unit Colstrip station. To reduce NO<sub>x</sub> emissions to a 30-day rolling average of 0.15 lb/mmBtu, the Proposed Rule required PPL Montana to install two new technologies—separated overfire air ("SOFA") and selective non-catalytic reduction ("SNCR") at Colstrip Units 1 and 2. *Id.* at 24,027, 24,035. To reduce SO<sub>2</sub> emissions to a 30-day rolling average of 0.08 lb/mmBtu, the Proposed Rule required PPL Montana to implement two additional new technologies at Colstrip Units 1 and 2—lime injection and a fourth "scrubber." *Id.* at 24,028, 24,035. The Proposed Rule did not require PPL Montana to implement new technologies at Colstrip Units 3 and 4.

Second, the Proposed Rule required PPL Montana to limit NO<sub>x</sub> and SO<sub>2</sub> emissions at the Corette station. The Proposed Rule imposed 30-day average rolling emission limits of 0.40 lb/mmBtu for NO<sub>x</sub> and 0.70 lb/mmBtu for SO<sub>2</sub>. *See id.* at 24,042, 24,046. It required PPL Montana to achieve such

emissions using current technology; unlike at Colstrip Units 1 and 2, the Proposed Rule does not require installation of new technology at Corette. *Id.* at 24,043, 24,047.

Both PPL Montana and NPCA commented on the Proposed Rule. At the conclusion of the notice and comment period, EPA issued its final FIP for Montana on September 18, 2012. *See* Approval and Promulgation of Implementation Plans; State of Montana (the “Final Rule” or the “Rule”), 77 Fed. Reg. 57,864 (Sept. 18, 2012) (codified at 40 C.F.R. § 52.1396). The Final Rule implemented the Proposed Rule in almost all respects relevant to this appeal.<sup>3</sup>

## C

PPL Montana and NPCA both filed petitions for review of EPA’s BART determinations at Colstrip and Corette, which petitions were consolidated for purposes of this appeal. PPL Montana contends that the emissions limits set forth in the Rule for NO<sub>x</sub> and SO<sub>2</sub> at Colstrip Units 1 and 2—as well as the BART determinations underlying such limits—are essentially too stringent. It argues that EPA failed reasonably to explain the Rule’s BART selections and that EPA’s visibility model does not reasonably anticipate visibility improvement as a result of the Rule’s requirements. PPL Montana also challenges the emissions set forth in the Rule for Corette.

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<sup>3</sup> Although the Final Rule did not alter EPA’s BART determinations for either Colstrip or Corette, it did lower the Proposed Rule’s emission limits for NO<sub>x</sub> and SO<sub>2</sub> at Corette from 0.40 lb/mmBtu to 0.35 lb/mmBtu and from 0.70 lb/mmBtu to 0.57 lb/mmBtu, respectively. *See* Final Rule, 77 Fed. Reg. at 57,911.

NPCA also challenges the Rule's emissions limits and BART determinations at Colstrip Units 1 and 2 and Corette, contending essentially that such limits are not stringent enough. According to NPCA, EPA's decision not to require installation of more advanced technology at these locations was unexplained, arbitrary, and capricious. Moreover, according to NPCA, EPA's decision not to require installation of any new technologies at Colstrip Units 3 and 4 fails to satisfy the requirement that the Rule make reasonable progress toward visibility improvement.

#### D

EPA's implementation of the regional haze plan is governed by Section 307(d) of the Act, 42 U.S.C. § 7607(d). The statute requires that EPA explain the basis for its decisions, including underlying factual bases, methods of analysis, and legal and policy considerations. *Id.* § 7607(d)(6)(A). EPA must also respond to the comments, criticism, and new data submitted during the comment period. *Id.*

When we review an agency action “involv[ing] primarily issues of fact,” and where “analysis of the relevant documents ‘requires a high level of technical expertise,’ we must defer to ‘the informed discretion of the responsible federal agencies.’” *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 377 (1989) (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 412 (1976)). However, we do not defer to EPA actions that are “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law,” or that exceed EPA's statutory jurisdiction. 42 U.S.C. §§ 7607(D)(9)(A), (C). EPA's actions must be reasoned; EPA acts in an arbitrary and capricious manner if it fails to consider an important aspect

of a decision or if its explanation contradicts the evidence before it. *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). EPA's actions must also be consistent; an internally inconsistent analysis is arbitrary and capricious. *Gen. Chem. Corp. v. United States*, 817 F.2d 844, 857 (D.C. Cir. 1987) (per curiam).

## II

PPL Montana and NPCA each contest the Rule's BART determinations and prescribed limits for NO<sub>x</sub> and SO<sub>2</sub> emissions at Colstrip Units 1 and 2—and, for similar reasons, Corette.

### A

The heart of the dispute about EPA's BART selection at Colstrip Units 1 and 2 is its determination that use of SNCR in addition to SOFA is cost-effective, and that use of selective catalytic reduction ("SCR")—a more aggressive technology—in addition to SOFA is not. Both parties urge that EPA's cost-effectiveness analysis fails appropriately to consider the costs of compliance and degree of visibility impairment, as required by the Act, *see* 42 U.S.C. § 7491(g)(2), at Step Three of EPA's BART analysis under the Guidelines, *see* 40 C.F.R. Pt. 51, App. Y § IV.D.

The Rule requires PPL Montana to reduce NO<sub>x</sub> emissions at Colstrip Units 1 and 2 to 0.15 lb/mmBtu over a 30-day rolling average. *See* 40 C.F.R. § 52.1396(c)(1). EPA concluded that such reduction could be achieved by installing both SOFA and SNCR technologies. *See* Final Rule, 77 Fed. Reg. at 57,866. NPCA contends that EPA offered insufficient

justification for its rejection of SCR as BART in favor of SOFA and SNCR together, and argues that PPL Montana should be required to install SCR instead of SNCR, and in addition to SOFA, at all four Colstrip units. PPL Montana makes a related point, but on the other side of the argument, contending that EPA offered insufficient justification for requiring SOFA and SNCR as BART instead of SOFA alone—a remedy PPL Montana does not oppose. EPA responds that the BART determination is discretionary and that it considered all of the relevant factors in reaching its conclusions.

The parties also challenge several more minor aspects of EPA's cost-effectiveness analysis. PPL Montana argues that EPA's use of the dollar-per-ton metric for balancing cost and visibility benefit was improper. NPCA, for its part, maintains that EPA underestimated the emissions baseline at Colstrip Units 1 and 2, and that it miscalculated the cost of implementing SCR at these units.

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EPA identified the costs of the various technologies for NO<sub>x</sub> reduction at Colstrip Units 1 and 2 as follows:

<b>Technology</b>	<b>Capital Cost</b>	<b>Annualized Cost</b>	<b>Tons per Year</b>	<b>Cost per Ton</b>
<b>COLSTRIP UNIT 1</b>				
SOFA	\$4.508 mm	\$1.090mm	1,432	\$761
SOFA + SNCR	\$13.381 mm	\$3.279mm	2,097	\$1,564
SOFA + SCR	\$82.772 mm	\$10.942mm	3,425	\$3,195
<b>COLSTRIP UNIT 2</b>				
SOFA	\$4.508 mm	\$1.090mm	1,420	\$768
SOFA + SNCR	\$13.381 mm	\$3.256mm	2,072	\$1,571
SOFA + SCR	\$82.771 mm	\$10.920mm	3,376	\$3,235

*See* Proposed Rule, Tables 66–74, 89–97, 77 Fed. Reg. at 24,024–27, 24,032–34.

The Rule offers essentially no reasoning behind EPA’s selection of SOFA and SNCR together, as opposed either to SOFA alone or SOFA and SCR together, as BART to reduce NO<sub>x</sub> emissions at Colstrip Units 1 and 2. With respect to the decision to require SNCR in addition to SOFA, EPA asserted in the Proposed Rule only that the cost of SOFA and SNCR together “is justified when the visibility improvement is considered.” *See* Proposed Rule, 77 Fed. Reg. at 24,027. In

response to PPL Montana's comment requesting that EPA explain this assertion, EPA noted that the Proposed Rule discloses the cost for both SOFA alone and SOFA combined with SNCR, and that it "selected SNCR as BART in consideration of these costs, all of which were presented to the public in our proposed rule." Final Rule, 77 Fed. Reg. at 57,886. But PPL Montana's objection is not that EPA failed to disclose the cost differential between implementing SOFA alone and SOFA along with SNCR. It contends instead that EPA failed to explain the reasons why the improvement achieved through SOFA alone was insufficient, but the improvement achieved through SOFA and SNCR together was deemed both sufficient and cost-effective.

With respect to SCR, EPA simply asserted that the cost of SOFA and SCR together (\$3,195/ton at Colstrip Unit 1) was "not justified by the visibility improvement of .404 deciviews," but that "[t]he lower cost of SOFA + SNCR (\$1,564/ton) is justified when the visibility improvement [of .264 deciviews] is considered." Proposed Rule, 77 Fed. Reg. at 24,027. EPA maintains that it did not use a set cost-effectiveness or improvement threshold to disqualify SCR, and we do not suggest that it must do so. But absent any explanation at all of how EPA determines cost-effectiveness, it is impossible for the Rule's reader to determine why EPA ruled SOFA and SNCR in and ruled SCR out.

EPA acknowledged that the Regional Haze Rule does not prevent it from implementing what it called a "bright line" rule for cost-effectiveness, but contends that its regulations do not require it to do so. *See* Final Rule, 77 Fed. Reg. at 57,872. To be sure, the Act and the Regulations do not specifically require that EPA explain its cost-effectiveness decisions through use of a "bright line" rule. But the law



does require EPA to “cogently explain why it has exercised its discretion in a given manner.” *See State Farm*, 463 U.S. at 48; *Greater Yellowstone Coalition, Inc. v. Servheen*, 665 F.3d 1015, 1030 (9th Cir. 2011) (requiring “a rational connection between the data before [the agency] and its conclusion”); *Nw. Env'tl. Def. Ctr. v. Bonneville Power Admin.*, 477 F.3d 668, 691 (9th Cir. 2007). EPA’s unexplained assertions that the combination of SOFA and SNCR is cost-effective, but that SOFA alone is insufficient, and that the combination of SOFA and SCR is not cost-effective, are unsupported by any explained reasoning. These assertions leave the Rule’s reader wondering what metric, if any, EPA used to determine BART, or if EPA employed no metric, why not. Therefore, we conclude that EPA’s BART determination for NO<sub>x</sub> emissions at Colstrip Units 1 and 2 is arbitrary and capricious.

2

EPA’s responses to petitioners’ more minor challenges to its cost-effectiveness analysis make clear that it is capable of the required rational explanation.

*First*, NPCA challenges EPA’s selection of the years 2008–2010 as the emissions baseline period for calculating BART at Colstrip Units 1 and 2. It contends that EPA underestimated the potential benefit of using SCR by first underestimating the existing emissions baseline. EPA’s BART Guidelines require it to choose a representative baseline period that supplies “a realistic depiction of anticipated annual emissions for the source.” BART Guidelines, 70 Fed. Reg. at 39,167. EPA chose the period 2008–2010 on the reasoning that Colstrip had installed additional combustion controls in 2007, reducing its

emissions. *See id.* NPCA argues that EPA should have chosen earlier periods because PPL Montana is not *required* to maintain the rate of emissions achieved between 2008–2010, describing the changes at Colstrip as “unenforceable.” But EPA offered a reasoned response to NPCA’s comment about its choice—that Colstrip had achieved reduced emissions using technology it has no plans to deactivate—and NPCA has suggested no reason to believe that PPL Montana would change course and remove the additional combustion controls it had already installed. EPA gave a reasoned, rational response to this argument, a response to which a reviewing court defers. *See Latino Issues Forum v. EPA*, 558 F.3d 936, 941 (9th Cir. 2009).

*Second*, PPL Montana objects that EPA’s reliance on a dollars-per-ton metric to calculate cost effectiveness is inappropriate because it does not actually measure the improvement achieved in visibility. But EPA responded that it has previously defined “cost effectiveness” as “tons of pollutant emissions removed” compared with “annualized control costs.” 2005 Regulations, 70 Fed. Reg. at 39,167. Indeed, PPL Montana essentially abandoned this argument in reply after EPA pointed to its regulation in its response brief.

*Third*, NPCA objects that EPA improperly calculated the cost of installing SCR at Colstrip Units 1 and 2, leading it to reject SCR as BART. It challenges EPA’s calculation of the capital cost, its choice of interest rate, and the lifespan and maintenance costs assumed in EPA’s calculation. EPA provided a reasoned response to NPCA’s comments on these questions. *See Final Rule*, 77 Fed. Reg. at 57,888–89. NPCA maintains that EPA should have looked to different data sources to determine these costs. But it offers a *reason* that EPA should look to different underlying cost data in only one

example case. It contends EPA should have chosen a 5% interest rate instead of a 7% interest rate in calculating these costs to comport with the requirements set forth in the EPA Air Pollution Cost Manual. But that manual instructs *industry* actors that they may wish to use a different interest rate for their own calculations. As EPA explained, *see* Final Rule, 77 Fed. Reg. at 57,888–89, EPA's Manual clearly contemplates that EPA will use the interest rate set by the OMB, as it properly did here, in pursuing *its* own calculations. *See id.*

## 3

Both petitioners dispute the rationality of EPA's selection of a fourth scrubber as BART for SO<sub>2</sub> emissions control at Colstrip Units 1 and 2 for essentially the same reasons they dispute EPA's NO<sub>x</sub> BART determinations. EPA determined the costs of the various technologies for reducing SO<sub>2</sub> emissions at Colstrip as follows:

<b>Technology</b>	<b>Capital Cost</b>	<b>Annualized Cost</b>	<b>Tons per Year</b>	<b>Cost per Ton</b>
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**COLSTRIP I**

Lime injection	\$3.00mm	\$1.883mm	3,557	\$529
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Lime injection + New scrubber	\$28.00 mm	\$4.100mm	4,486	\$912
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**COLSTRIP II**

Lime injection	\$3.00mm	\$1.883mm	3,212	\$586
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Lime injection + New scrubber	\$28.00 mm	\$4.093mm	4,129	\$991
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*See Proposed Rule, Tables 78–87, 102–111, 77 Fed. Reg. at 24,028–29, 24,036–37.*

PPL Montana contends that EPA underestimated the cost of installing a fourth scrubber at Colstrip Units 1 and 2 and failed sufficiently to explain its cost-effectiveness determination for this requirement. NPCA, to the contrary, contends that EPA should have required installation of *replacement* advanced scrubbers at Colstrip, not just the introduction of an additional scrubber. EPA responds that it appropriately explained its calculation of the costs involved in adding an additional scrubber and that it appropriately

decided not to require an entirely new system of scrubbers, as opposed only to adding one additional scrubber.

EPA's cost-effectiveness analysis with respect to SO<sub>2</sub> emissions at Colstrip Units 1 and 2 suffers the same defect as its cost-effectiveness with respect to NO<sub>x</sub> emissions. EPA's SO<sub>2</sub> analysis is an improvement in one respect: EPA acknowledged the incremental cost of adding an additional scrubber vessel (\$2,410/ton at Colstrip Unit 2, *see* Final Rule, 77 Fed. Reg. at 57,892), and noted that adding a scrubber vessel would incrementally improve visibility from 0.225 deciview (using lime injection alone) to 0.280 deciview (using lime injection and an additional scrubber vessel). *See id.* But EPA then concluded that it "continue[s] to find that the cost is reasonable given the visibility benefits[.]" *Id.* Although in this case EPA acknowledged the comment concerning incremental cost-effectiveness, it nevertheless still failed to explain what makes a cost reasonable in light of potential visibility benefits.

The Rule's SO<sub>2</sub> emission limits for Colstrip Units 1 and 2 force PPL Montana to spend an additional \$25,000,000 in capital costs and an additional \$2,210,000 annually to achieve a visibility improvement of 0.055 deciviews at the sampled location. *See id.* This improvement very well may be necessary and ultimately cost-effective. But EPA has supplied no reasons justifying that determination. Based on its explanation, the Rule's reader is left to wonder what rationale EPA used to determine cost-effectiveness. Again, the law requires a reasoned answer to that question. *See State Farm*, 463 U.S. at 48; *Servheen*, 665 F.3d at 1028; *Nw. Env'tl. Def. Ctr.*, 477 F.3d at 691.

By contrast, EPA thoroughly and rationally explained its response to NPCA's objection on this point. NPCA contends that EPA should have considered requiring complete replacement of the existing control systems for SO<sub>2</sub> emissions at Colstrip Units 1 and 2. EPA explained its decision not to do so: its BART Guidelines recommend constructing a new system when a current control system achieves "less than 50 percent removal efficiencies." Final Rule, 77 Fed. Reg. at 57,892 (quoting 2005 Regulations, 70 Fed. Reg. at 39,171) (internal quotation marks omitted). The current SO<sub>2</sub> emissions control system at Colstrip Units 1 and 2 achieves removal efficiencies exceeding 50 percent, *see* Proposed Rule, 77 Fed. Reg. at 24,028, and therefore EPA is not required to consider replacement technology. *See* Final Rule, 77 Fed. Reg. at 57,892.

This kind of explanation—not elaborate, but rational, and thus adequate—is missing from EPA's conclusion that PPL Montana must install a fourth scrubber at Colstrip Units 1 and 2. EPA's determination of BART to control SO<sub>2</sub> emissions suffers the same failure of rational explanation as its BART determination for NO<sub>x</sub> emissions. Because the rule offers no reasoned explanation to support its requirement of a fourth scrubber at Colstrip Units 1 and 2, we conclude that such requirement is arbitrary and capricious.

## B

PPL Montana also, relatedly, contends that EPA's BART determinations at Colstrip Units 1 and 2 are arbitrary and capricious because they are inconsistent with EPA's Corette analysis, which does not require additional controls at that station, *see* Final Rule, 77 Fed. Reg. at 57,893. PPL Montana points out that EPA rejected implementation of SOFA at

Corette, but found similar costs for SOFA installation justified at Colstrip Units 1 and 2. *See supra* § II.A.1. NPCA, on the other hand, argues that EPA's conclusion that additional controls at Corette were *not* cost-effective was arbitrary and capricious.

The entirety of EPA's cost-effectiveness reasoning with respect to Corette follows: "We have weighed costs against the anticipated visibility impacts for Corette. Any of the control options would have a positive impact on visibility; however, the cost of controls is not justified by the visibility improvement." Proposed Rule, 77 Fed. Reg. at 24,043. Again, this reasoning fails to reveal to a reader how EPA determined that the cost of controls were not justified. Moreover, PPL Montana is correct that this reasoning appears inconsistent with EPA's analysis for Colstrip Units 1 and 2. At those units, EPA concluded that a cost-per-ton rate of approximately \$1,500 for NO<sub>x</sub> emissions controls *was* justified. *See supra* § II.A.1. Yet at Corette, EPA concluded that a cost-per-ton rate of \$1,487 did not justify the potential emissions reductions. *See* Proposed Rule, 77 Fed. Reg. at 24,040–43. Corette, moreover, is closer to Class I areas than Colstrip, and emissions controls there could have improved visibility at least as much as they were set to control visibility at Colstrip. *See id.* The seeming inconsistency in EPA's BART determinations at Colstrip Units 1 and 2 and Corette is, absent explanation, "the hallmark of arbitrary action." *Sierra Club v. EPA*, 719 F.2d 436, 459 (D.C. Cir. 1983); *see also Gen. Chem. Corp. v. United States*, 817 F.2d 844, 846 (D.C. Cir. 1987) (*per curiam*) (finding analysis arbitrary and capricious because it was "internally inconsistent and inadequately explained").

## C

Finally, PPL Montana objects, on two grounds, to EPA's use of the CALPUFF<sup>4</sup> visibility model in determining BART at Colstrip Units 1 and 2. PPL Montana first objects that the maximum potential incremental visibility benefit of SNCR is below the range of perceptibility and falls within the model's margin of error, meaning such improvement cannot be "reasonably . . . anticipated" as required by the Act. *See* 42 U.S.C. § 7491(g)(2). It also challenges the application of CALPUFF to the emissions sources at issue because of their distance from Class I areas, contending the model is inaccurate at such great distances.

EPA responds that, because the CALPUFF model was approved in the Guidelines, EPA need not defend its every application. *See* Final Rule, 77 Fed. Reg. at 57,867. EPA also responds that the Regional Haze Rule itself anticipated and rejected PPL Montana's argument, reasoning that "[f]ailing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment." Final Rule, 77 Fed. Reg. at 57,883 (quoting 2005 Regulations, 70 Fed. Reg. at 39,129). EPA further responds that it "has acknowledged that there is uncertainty in the CALPUFF model predicted visibility impacts," and "the CALPUFF model can both underpredict and overpredict visibility impacts," but that "CALPUFF . . . is a reasonable application to determine whether such a facility [with an impact exceeding 2 or 3 deciviews] can reasonably be anticipated to cause or contribute to any

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<sup>4</sup> CALPUFF is a model used to estimate an emissions source's impact on visibility. *See* 40 C.F.R. Pt. 51 App. Y § III.A.3.



impairment of visibility.” Final Rule, 77 Fed. Reg. at 57,868 (quoting 2005 Regulations, 77 Fed. Reg. 39,123).

EPA fails to understand PPL Montana’s first argument. PPL Montana does not object wholesale to EPA’s use of the CALPUFF model for visibility measurement. Instead, it argues that the results the model predicts in this case are too insignificant for the model to measure, and therefore cannot be reasonably anticipated as the Act requires. During the notice and comment period, PPL Montana argued that the maximum incremental visibility benefit to be gained by installing SNCR at Colstrip Units 1 and 2 would be 0.085 deciviews, an incremental improvement PPL Montana contends falls within the CALPUFF model’s margin of error. EPA responded by explaining that its regulation permits visibility improvements to be required even when visibility impacts fall below the threshold of perceptibility. *See* Final Rule, 77 Fed. Reg. at 57,867. EPA further responded that its 2005 Regulations direct use of the CALPUFF model to estimate the 98th percentile of visibility impairment, rather than the highest data collected, to minimize uncertainty in its calculations. *See id.* at 57,868. But PPL Montana does not ask EPA to discontinue application of CALPUFF below the one-deciview perceptibility threshold, or to run the model using different data points than the ones selected; it asks how CALPUFF explains EPA’s conclusion that additional measures will lead to reasonable anticipation of visibility improvement in this case, when, PPL asserts, an improvement of 0.085 deciview is “beyond the CALPUFF model’s ability to predict with any confidence.”

EPA’s response does not meaningfully address PPL Montana’s comment, as it must. *See Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998);

*Eagle-Picher Indus., Inc. v. EPA*, 759 F.2d 905, 922 (D.C. Cir. 1985) (“[I]f . . . the model is challenged, the agency must provide a full analytical defense.”).<sup>5</sup> It is no answer to respond, as EPA did, that low levels of visibility impairment must be addressed even though they are not perceptible to the human eye, or that measures have been taken to minimize the margin of error. The issue is not the *perceptibility* of the proposed improvements, but the model’s ability to anticipate improvements at a level allegedly within its margin of error, whether perceptible or not to the human eye. EPA simply offered no response to this objection.

EPA’s only detailed defense of the model addressed PPL Montana’s concern about distance—not the margin of error issue. *See* Final Rule, 77 Fed. Reg. at 57,867–68. With regard to distance, EPA noted that guidance issued by the Interagency Workgroup on Air Quality Modeling “provides for the use of the CALPUFF model at receptor distances of up to 200 to 300 km.” EPA then explained why it believed CALPUFF could be used “cautiously” for distances in that range, even though the puffs would be more dispersed at

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<sup>5</sup> Requiring such an explanation does not, as EPA argues, improperly require *de novo* review of EPA’s use of the CALPUFF model itself. EPA “need not justify the model on an *ad hoc* basis for every chemical to which the model is applied, even when faced with data indicating that it is not a perfect fit.” *Chem. Mfrs. Ass’n v. EPA*, 28 F.3d 1259, 1265 (D.C. Cir. 1994). But PPL Montana does not ask EPA to justify its model. Accepting CALPUFF as the applicable model, PPL Montana asks *how CALPUFF explains* EPA’s selection of an additional technology for BART, a question EPA has not answered. In such a situation, deference even on methodological questions is inappropriate. *See Brower v. Evans*, 257 F.3d 1058, 1067 (9th Cir. 2001) (holding deference overcome where agency “completely failed to address some factor consideration of which was essential to [making an] informed decision” (internal quotation marks and citation omitted)).

greater distances, and stated that the model was not suitable for “very long-range transport (300 km and beyond).” *Id.* at 57,868. EPA thus offered a reasoned response to PPL Montana’s challenge to the use of CALPUFF at the distances in question. That explanation did not, however, also suffice as a reasoned response regarding how CALPUFF could be relied upon to predict an improvement of as little as 0.085 deciviews when PPL offered reasons to think that doing so was outside the model’s capabilities.

The predictability concern is important because the Act requires that any visibility improvement be “reasonably . . . anticipated” as a result of BART installation. 42 U.S.C. § 7491(g)(2). As the D.C. Circuit explained in vacating a portion of the Regional Haze Rule itself, it is arbitrary and capricious for EPA to force an emissions source “to spend millions of dollars for new technology that will have no appreciable effect on the haze in any Class I area.” *Am. Corn Growers Ass’n*, 291 F.3d at 7. In response to PPL Montana’s contentions that the Final Rule would do just that, by requiring PPL Montana to install SNCR at Colstrip Units 1 and 2 without sufficient assurance of any improvement at all, EPA has offered no reasoned explanation.

### III

PPL Montana also challenges the emissions limitations EPA imposed at Corette—namely, the requirement that Corette lower its emissions levels even without installing additional technology. As explained, EPA’s determination that installation of additional technology to control emissions from Corette was not cost-effective suffers the same failure of explanation as its BART determinations at Colstrip. *See supra* § II.B. But the Rule also tightened the emissions limits

identified for Corette in the Proposed Rule. Specifically, in response to comments (including comments made by PPL Montana), EPA altered its rule to establish an emission rate of 0.57 lb/MMBtu for SO<sub>2</sub> emissions and an emission rate of 0.35 lb/MMBtu for NO<sub>x</sub> emissions, both monitored on a 30-day rolling average. *See* Final Rule, 77 Fed. Reg. at 57,893–94. PPL Montana argues that the CAA does not authorize EPA to impose emissions limits without determining BART, but EPA insists that its analysis comported with the BART Guidelines.<sup>6</sup>

EPA correctly argues that, after it found Corette already had BART technology in place, it was authorized by the Regional Haze Rule to “skip the remaining analyses in this section, including the visibility analysis in step 5.” *See* 2005 Regulations, 70 Fed. Reg. at 39,165. PPL Montana’s contention that EPA was nevertheless required to proceed with the remaining BART analysis is a challenge to this provision of the Regional Haze Rule itself, not properly asserted in this challenge to the Montana FIP. *See* 42 U.S.C. § 7607(b)(1) (challenge to rulemaking must be brought within sixty days).

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<sup>6</sup> EPA contends first that PPL Montana waived its objection on this point by failing to make a relevant comment to the Proposed Rule. Contrary to EPA’s argument, PPL Montana preserved its objection to the Corette emissions limits when it made its comments, which urged that, with Corette’s current technology, converting annualized emissions limits to 30-day rolling average limits would require an *increase* in emissions limits. Moreover, EPA specifically addressed this comment in the Rule, noting that a commenter had suggested an increase in emissions limits to 0.81 lb/MMBtu for SO<sub>2</sub> emissions and to 0.46 lb/MMBtu for NO<sub>x</sub> emissions. *See* Final Rule, 77 Fed. Reg. at 57,893.

EPA also properly set emissions limits for Corette on a 30-day rolling average. The Regional Haze Rule prescribes such limits. *See* 2005 Regulations, 70 Fed. Reg. 39,172 (requiring emissions limits to “specify an averaging time of a 30-day rolling average”). EPA noted and addressed PPL Montana’s comment about the 30-day rolling average requirement. *See* Final Rule, 77 Fed. Reg. at 57,893–94. PPL Montana contended that converting current emissions limits to 30-day rolling averages would require EPA to *raise* the limits set forth in the Proposed Rule. EPA concluded to the contrary that, by choosing 99th percentile monthly emission rates and adding an additional margin for compliance, the 30-day rolling averages provided in the rule comported with Corette’s current technological capabilities. *See id.* EPA’s reasoned disagreement on this topic with PPL Montana’s comment reflects its conclusion on a highly scientific question—the variance in emissions calculations that occurs when annualized rates are translated into thirty-day rolling averages—precisely the kind of question justifying deference to EPA’s discretion. *See Nat’l Wildlife Fed’n v. U.S. Army Corps of Eng’rs*, 384 F.3d 1163, 1177–78 (9th Cir. 2004).

#### IV

NPCA contends that EPA’s decision not to require any additional emission-reducing technology, let alone installation of SCR, at Colstrip Units 3 and 4 was arbitrary and capricious because it fails to satisfy the Act’s reasonable progress requirements. Colstrip Units 3 and 4 are not subject to BART requirements because they were constructed after 1977. *See* 42 U.S.C. § 7491(b)(2), (g). Nevertheless, the Act still directs EPA to issue regulations assuring “reasonable progress” toward improving visibility in Class I areas. *See*

42 U.S.C. § 7491(a)(4). The statute requires EPA to consider several factors in determining reasonable progress: (a) costs of compliance; (b) the time necessary for compliance; (c) the energy and other environmental impacts of compliance; and (d) the remaining useful life of a source subject to reasonable progress requirements. *See* 42 U.S.C. § 7491(g)(1). EPA's Regulations prescribe reasonable progress toward attaining natural visibility conditions by 2064. *See* 40 C.F.R. § 51.308(f).

EPA responded to comments contending that the visibility benefits to be gained from SCR at Colstrip Units 3 and 4 justify the requirement for reasonable progress purposes. *See* Final Rule, 77 Fed. Reg. at 57,902–03. It explained that the cost of compliance is only one of the four statutory requirements for reasonable progress analysis. *See id.* EPA also offered a better explanation for its cost-based decision on this point than it did for its cost-effectiveness determination of BART at Colstrip and Corette. It reasoned that the visibility benefits to be gained from requiring SCR (ranging from 0.273 deciviews to 0.260 deciviews) were not sufficient considering their cost, between \$4,574 and \$4,607 per ton. *See id.* EPA contrasted this effectiveness with the reasonable progress goals it implemented in North Dakota at Antelope Valley Station—a location to which NPCA specifically urged comparison. *See id.* EPA explained that it had found improvements of 0.2 deciviews at each unit of that location to be cost-justified for reasonable progress purposes when the costs of such improvement ranged from \$586/ton to \$661/ton. *See id.* EPA's comparison of the two sources provided NPCA with at least some broad metric for understanding which cost-per-ton ratios EPA will approve and which it will not—a rational explanation why the reasonable progress options available at Colstrip Units 3 and 4 were not feasible.

V

For the reasons explained, we **GRANT IN PART** and **DENY IN PART** the petitions for review, **VACATE** the portions of the Rule setting emissions limits at Colstrip Units 1 and 2 and Corette and **REMAND** to EPA for further proceedings consistent with this opinion. Each party shall bear its own costs.<sup>7</sup>

**PETITIONS FOR REVIEW GRANTED IN PART AND DENIED IN PART; VACATED AND REMANDED.**

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BERZON, Circuit Judge, concurring.

I concur. I write separately to underline my understanding that, in Part II.C of the lead opinion, we are not impugning EPA's use of the CALPUFF model generally. Instead, we are requiring a sufficiently reasoned response to a particular comment regarding CALPUFF's usefulness in these specific circumstances. Had EPA given any reasonable explanation as to why CALPUFF was not just "sufficiently

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<sup>7</sup> Petitioners National Parks Conservation Association, Montana Environmental Information Center, and Sierra Club's Motion for Judicial Notice of Standing Declarations filed March 14, 2013 is **DENIED** as moot.

Petitioner PPL Montana, LLC's Unopposed Motion to Take Judicial Notice Regarding J.E. Corette Steam Electric Station filed March 17, 2015 is **DENIED**. The facts contained therein are neither generally known within the court's territorial jurisdiction nor accurately and readily determinable from sources whose accuracy cannot reasonably be questioned. *See* Fed. R. Evid. 201(b).

reliable to inform the decision making process” generally, 77 Fed. Reg. 57,864, 57,868 (Sept. 18, 2012), but also specifically suitable for predicting visibility improvement in the pertinent factual context at increments as small as 0.085 deciviews, then we could require no more.

The arbitrary-and-capricious standard of review authorizes remand where, inter alia, the agency has “*entirely* failed to consider an important aspect of the problem,” by “g[iving] no consideration whatever” to it. *Motor Vehicle Mfrs. Ass’n of the United States, Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 46 (1983) (emphasis added). The “standard of review . . . [requires] only reasonableness, not perfection.” *Kennecott Greens Creek Mining Co. v. Mine Safety & Health Admin.*, 476 F.3d 946, 954 (D.C. Cir. 2007); see also *J & G Sales Ltd. v. Truscott*, 473 F.3d 1043, 1051–52 (9th Cir. 2007). “[W]here the agency ‘considered the relevant factors and articulated a rational connection between the facts found and the choice made,’” we must defer to the “reasonable basis” of that decision. *Arrington v. Daniels*, 516 F.3d 1106, 1112 (9th Cir. 2008) (quoting *Ranchers Cattlemen Action Legal Fund v. U.S. Dep’t of Agric.*, 415 F.3d 1078, 1099 (9th Cir. 2005)). As the Supreme Court has frequently reiterated, courts “should ‘uphold a decision of less than ideal clarity if the agency’s path may reasonably be discerned.’” *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 513–14 (2009) (quoting *Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc.*, 419 U.S. 281, 286 (1974)).

Here, as the majority opinion concludes, in light of the comments received, EPA did not give any adequate, reasoned explanation as to why CALPUFF supported installation of SNCR at Colstrip Units 1 and 2. PPL Montana argued in its comment that the predicted improvement of 0.085 deciviews



from SCNR was “within the error range of the model,” and therefore such improvement could not “reasonably be anticipated” to result from SNCR. 42 U.S.C. § 7491(g)(2). EPA’s generic response, that “the CALPUFF model can both underpredict and overpredict visibility impacts,” but that it viewed the model as nonetheless “sufficiently reliable to inform the decisionmaking process,” does not meaningfully respond to PPL’s argument. 77 Fed. Reg. at 57,868.

Several kinds of responsive answers to PPL Montana’s comment about CALPUFF’s margin of error, if supportable, could have sufficed to enable “the agency’s path . . . reasonably [to] be discerned.” *Fox Television Stations*, 556 U.S. at 513–14 (quoting *Bowman Transp.*, 419 U.S. at 286) (internal quotation marks omitted). For example, perhaps there is a basis to dispute the assertion that a visibility improvement of 0.085 deciviews fell within the model’s margin of error. Or perhaps it is significant that the fact that a predicted improvement falls within a model’s margin of error does not prove the predicted improvement will *not* occur, just that it is less *likely* to occur. Or perhaps there is another reason why EPA thought a 0.085 deciview improvement could “reasonably be anticipated” to result from SNCR even if such increment fell within the model’s margin of error. 42 U.S.C. § 7491(g)(2).

My examples are not meant to put words in EPA’s mouth (if an agency can be said to have a mouth). But EPA said nothing of either sort, or anything else responsive to the PPL CALPUFF comment. Instead, it just professed general confidence in the CALPUFF model—which may well be warranted—but was not responsive to the *particular* concerns expressed. Courts are just not in a position to provide data-based or statistically based explanations, which is one reason

why this Court “may not supply a reasoned basis for the agency’s action that the [expert] agency itself has not given.” *Motor Vehicle Mfrs. Ass’n*, 463 U.S. at 43 (quoting *SEC v. Chenery Corp.*, 332 U.S. 194, 196 (1947)) (internal quotation mark omitted).

In short, even under the deferential arbitrary-and-capricious standard of review, it is impossible to say whether EPA has “considered the relevant factors and articulated a rational connection between the facts found and the choice made” with regard to CALPUFF’s ability to predict improvements as small as 0.085 deciview at Colstrip Units 1 and 2. *Arrington*, 516 F.3d at 1112 (quoting *Ranchers Cattlemen Action Legal Fund*, 415 F.3d at 1093). Perhaps it did. But it has not, even minimally, provided any indication that it did in the comments and analysis accompanying the Rule. For that reason alone, and not because I have any reason to question whether the CALPUFF model is generally fully adequate to the purposes for which EPA uses it, I concur.